

FAMILY CHANGE IN NEPAL: EVIDENCE FROM WESTERN CHITWAN

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Family change has been of central interest in both academia and the policy arena for some time. Because family has always had the primary responsibility for raising children, caring for individuals as they age, and generally pursuing the welfare of their individual members, and changes in the family have important influences on individuals, the study of family change has received great attention in this research literature. Moreover, as social scientists discovered the many different forms of family change around the world, the study of the transitions became a central focus of family research (Goode 1970; Thornton 2001, 2005; Thornton and Lin 1994). These include the transition from large families with extended family living, high parental authority, low youth autonomy, young ages at marriage and childbearing, low levels of fertility control, or low women's status and independence to smaller families with nuclear family living, low parental control, high youth autonomy, older age at marriage and childbearing, high levels of fertility control including childlessness, or high women's status and independence, commonly labeled as western family behaviour.

Here we document the changes in family life in Nepal and examine the driving forces behind those changes in a society beginning with high fertility, young age at marriage and childbearing, low youth autonomy and low use of birth control. To document the family changes and the forces behind those changes, we take advantage of the Chitwan Valley Family Study (CVFS), a longitudinal panel study specifically designed to study families and family formation behaviours in a rapidly changing society.

The Chitwan Valley in central Nepal provides an ideal setting for studying the transition from a historical Nepali family system to a new family system with western family behaviours. Up until the early 1970s, Chitwan was an isolated valley surrounded by rivers and dense forest and heavily infested by malaria. It was a purely subsistence agricultural society with most social activities organized within families and patterns of family formation as they had been for centuries. Beginning in the late 1970s, Chitwan valley has undergone a dramatic social change that spurred the spread of wage labor employment, schools, markets, transportation, government services, and the mass media. In 1995 we launched the Chitwan Valley Family Study (CVFS) to document the rapid social changes occurring in Chitwan and to investigate their influence on family formation behaviours. By 2005, this project has

accumulated more than two-dozen studies of factors implicated in changing the timing of marriage, the arrangement of marriage, family size preferences, the timing of first birth and the use of contraception for spacing childbearing. Each of these dimensions of family formation has undergone tremendous change in Chitwan Valley.

We begin with a theoretical framework designed to explain the change in these family behaviours. We draw on the family mode of social organization approach to explain family change and variation in this setting (Thornton and Fricke 1987; Thornton, Fricke, Yang and Chang 1994). Next we turn to empirical evidence about family change in Nepal. Drawing on results from several different studies using data from the CVFS, we summarize the evidence of family change and the drivers of these changes in Chitwan valley.

Theoretical Framework

The family is the primary group within which most individuals spend the majority of their lifetimes and in which virtually all individuals spend the early years of their lives, making the family a ubiquitous element of social life and a common object of social research (Goode 1970; Thornton 2001; 2005). In fact, family has always had the primary responsibility for raising children, caring for individuals as they age, and generally pursuing the welfare of their individual members. Given the centrality of the family in most societies, family change has been so important that numerous theorists have focused on these phenomena to understand change and variation in the families around the world.

Theories of Family Change

Social scientists have offered a wide range of explanations for family changes in both the Western and non-Western parts of the world. For the most part, these explanations have been structural, emphasizing changes in the economic, social and political structure of society. Most important have been the dramatic restructuring of societies through industrialization, urbanization, increases in education and knowledge, and increased consumption and social mobility (Becker 1991, 1996; Coleman 1990; LePlay 1982 [1862]; Marx 1981 [1963-65]; Westermarck 1894 [1891]). Other commonly offered explanations include changes in science and technology, with particular emphasis on more rapid transportation and communication networks, the expansion of mass media, more effective contraceptives, and medical and public health innovations that have decreased morbidity and mortality (Caldwell 1982; Caldwell, Reddy and Caldwell 1983; Durkheim 1984 [1933]).

Although such structural explanations have predominated as explanations of family change, more recent enquiries have emphasized the role of

ideational factors as part of the explanations (Cleland and Wilson 1987; Caldwell 1982; Chesnais 1992; Mason 1997; Thornton and Lin 1994). For example, Lesthaeghe and his colleagues have argued persuasively that changes in religiosity and secularism are essential components for explanations of changing family behaviour in Europe (Lesthaeghe 1983; Lesthaeghe and Wilson 1986). Similarly, Caldwell (1982), Freedman (1979), and van de Kaa (1996) have all emphasized the importance of the spread of western ideas and beliefs for changes in family behaviour and ideals in non-western populations. Our own research, and that of others in Nepal, suggests that both structural and ideational forces have been important elements of family change (Ahearn 1994, 2004; Axinn and Yabiku 2001; Axinn and Barber 2001; Barber et al. 2002; Barber and Axinn 2005; Barber 2004; Ghimire et al. 2006; Suwal 2001; Yabiku et al. 1999).

To explain the dramatic family changes in Nepal, we build on the modes of social organization framework considering both the structural and ideational aspects and their potential influence for individuals and families (Thornton and Fricke 1987; Thornton and Lin 1994). This framework focuses on the extent to which the activities of daily social life, including authority patterns, information flow, living arrangements, production, consumption, socialization, leisure, and reproduction, are organized by the family versus other non-family social institutions and organizations. The framework builds upon previous research that focused exclusively on the family mode of *production* (Caldwell 1982; Lesthaeghe and Wilson 1986) and extends it to modes of *social organization* across a variety of domains: consumption, residence, recreation, protection, socialization, procreation and production. Historically, most of the activities of daily living were organized within the family (Ogburn and Nimkoff 1955; Thornton and Fricke 1987). As social changes created new non-family institutions to organize these activities, they increasingly took place outside the family (Coleman 1990). Although no society is expected to be completely organized inside or outside of families, the contrast between these two ideal types, along a continuum of family organization, acts as an aid to our understanding of family change.

The modes of social organization framework can be used to integrate and expand upon existing explanations of family formation behaviour. To date, the theoretical work on family formation behaviour has mainly focused on two sets of explanations. First are microeconomic explanations, which emphasize the influence of changes in the costs and benefits of marriage and childrearing. Second are ideational explanations, which emphasize the influence of changes in the spread of new ideas, particularly Western family ideals related to marriage and childbearing.

Microeconomic Theories: Microeconomic theories of family formation processes focus on the costs and benefits of family formation (Becker 1991;

Easterlin, and Crimmins 1985; Notestein 1953; Lesthaeghe and Surkyn 1988; Willis 1973). These theories assume that individuals are aware of their self-interest, the options available to them, and are able to act to maximize benefits. Sociologists have employed these economic theories to study family formation behaviours. For example, Coleman (1990) links the reorganization of family life to individuals' childbearing and childrearing behaviours via the costs and benefits of childrearing. He argues that the proliferation of non-family organizations and institutions (what Coleman calls 'corporate actors') shift the locus of daily social activities such as production (p. 580), education (p. 581), food preparation (p. 587), and care of the aged (p. 584) and strips out the important roles the family has been performing historically. The key is that when these activities start to happen outside of the family, they reduce the benefits and increase the cost of marriage and childbearing. For example, when productive activities occur near the home, family members—spouse, children, and kin—can assist with different tasks creating positive externalities for marriage and childbearing. However, when non-family institutions take over these activities, the positive externalities begin to weaken, which increases the costs and decreases the benefits of marriage and childbearing. These increased costs and decreased benefits motivate individuals to delay marriage and limit their fertility (Coleman 1990: 585).

Similarly, Caldwell's intergenerational wealth flows theory of fertility decline also suggests that the reorganization of historical family roles, such as care for the elderly outside the family, reduces the couple's motivation to have children. When expansion of non-family institutions weakens the role of family members, particularly the children, intergenerational flows of wealth reverse, and flow from parents to children. This reversal, argues Caldwell, induces fertility declines (Caldwell 1982). Likewise, earlier theories of demographic change contain many similar ideas. For example, Notestein argued that the reorganization of social activities outside the family reduces parents' motivations to have children. He wrote that fertility transitions began in settings that stripped the family of many functions in production, consumption, recreation, and education (Notestein 1953: 16). Thus, all these theories suggest an important role of social and family organization to individual-level childbearing behaviour.

Ideational Theories: Different from microeconomic theories that emphasize the costs and benefits of marriage and childrearing, ideational theories stress the spread of new ideas and social interactions as the key to family change. Social interactions outside of the family change the pool of people with whom individuals interact, providing an opportunity to be exposed to new ideas about family formation. The ideational perspective initially emerged from the fact that the regional patterns of fertility decline in European countries were much more closely associated with social categories such as

ethnicity, language and religious groupings than differences in economic conditions, suggesting that patterns of communication and prevailing ideas about fertility behaviour in those communities may have shaped childbearing behaviour (Anderson 1986). Previous studies have linked the spread of many types of new ideas to later marriage and childbearing and high prevalence of contraceptives. These new ideas include information about love and later marriage (Macfarlane 1976; Rindfuss and Morgan 1983), smaller family size preferences (Caldwell 1982; Lightbourne 1984), modern contraceptive methods (Knodel 1987), higher consumption aspirations (Easterlin 1987; Freedman 1979), and secular and individualistic attitudes and preferences in general (Lesthaeghe and Wilson, 1986; Lesthaeghe and Surkyn 1988; Bumpass 1990). Scholars have not only linked these new ideas to love marriage (rather than arranged marriage), to older ages at marriages, to later childbearing, and to contraceptive prevalence, but they have also identified multiple potential mechanisms through which these new sets of ideas spread. These mechanisms include social networks (Watkins 1991; Watkins and Danzi 1995), the spread of Western ideas through colonial education systems (Caldwell 1982), increased migration, travel, and tourism (Bongaarts and Watkins 1996; Freedman 1979) and contact with mass media (Bongaarts and Watkins 1996; Casterline 1985).

The mode of social organization framework is consistent with both microeconomic and ideational theories of family change. For example, when daily activities are organized outside of the family, it may alter the costs and benefits of marriage and childrearing, stimulating individuals to change their behaviour, as asserted by most microeconomic theories (Bulatao and Lee 1983; Easterlin and Crimmins 1985). On the other hand, reorganized activities also alter the group of people with whom individuals interact, facilitating the diffusion of alternative ideas consistent with family and fertility theories emphasizing the diffusion of new ideas (Montgomery and Casterline 1993; Cleland and Wilson 1987). Thus the mode of social organization framework incorporates both microeconomic change and the diffusion of ideas as mechanisms of fertility change. This characteristic of the framework is particularly useful, as both sets of changes are likely to exert important influences on marriage and childbearing behaviour (Lesthaeghe and Surkyn 1988).

However, the family mode of social organization framework does not make a single set of universal predications. Instead, use of this framework requires us to define the starting state of the family organization and family behaviour in order to evaluate the likely consequences of specific changes in family organization. Therefore, we describe the setting for our research on family change before describing our specific hypotheses.

The Study Setting

The study area for this programme of research is the western part of the Chitwan Valley in the south central part of Nepal. As shown in Figure 1, it is surrounded by the Royal Chitwan National Park (reserved jungle) and the Rapti River in the south, Nepal's East-West Highway and Barandabar Forest in the east, and by the Narayani River in the west and north. The total land area of western Chitwan is 91 square miles. Until the 1950s, Chitwan was covered with dense tropical forest with diverse flora and fauna including the one horned rhino, the Bengal tiger and many species of highly poisonous snakes, birds, trees, shrubs and grasses. Because of the high prevalence of malaria, Chitwan was until the 1960s known as the Death Valley. There were only a few tribal communities, such as the Chepangs in the hills and the Tharus, Majhis and Botes along the riverside, who earned their livelihood through hunting, fishing and gathering forest products in Chitwan.

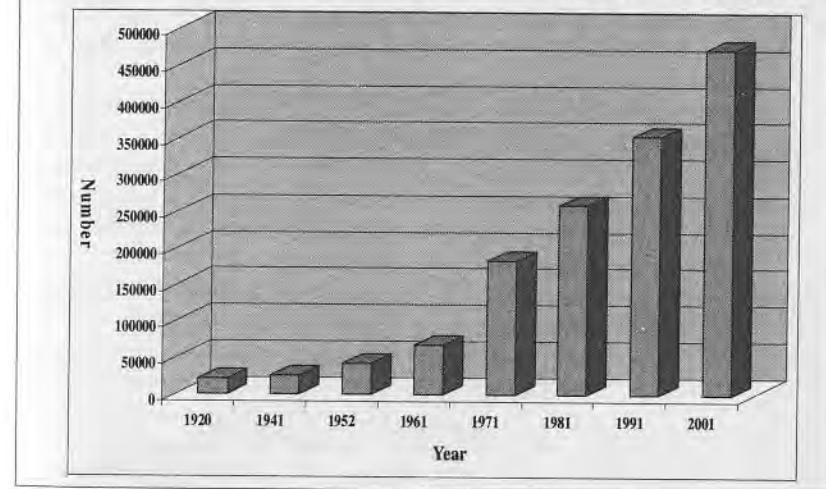
Figure 1: Map of Study Area : The Chitwan Valley



In 1955, the Nepalese government opened this valley for settlement by distributing land parcels to people from adjoining districts of the country. The flat terrain with its highly fertile soil and warm climate offered promising opportunities for people who were struggling with the steep mountain slopes

to support their survival. In 1956, the government, in collaboration with the United States government (International Cooperation Assistance [ICA]), implemented a malaria eradication programme and people slowly settled. Chitwan soon became a "melting pot," with people from all over the country. This geographically central, new settlement area became home to many different Himalayan ethnic groups. As shown in Figure 2, the population of the whole Chitwan district grew very rapidly.

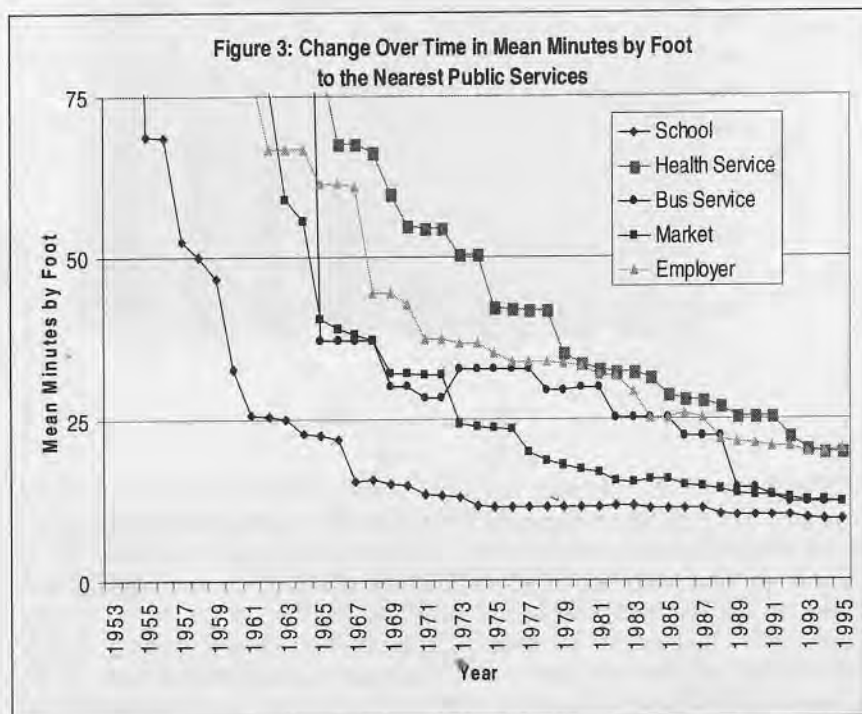
Figure 2. Population in Chitwan Over Time 1920-2001



Up until the 1970s, the valley remained largely isolated from the rest of the country. The first all-weather road into Chitwan was completed in 1979. This road linked Chitwan's largest town, Narayanghat, to cities in Eastern Nepal and India. Two other important roads followed: one in the west, linking that town to the western portion of Nepal, and another in the north, linking Chitwan to Kathmandu. Because of Narayanghat's central location, by the mid-1980s this once isolated town became the transportation hub of the country. This change produced a rapid proliferation of government services, businesses and wage labour jobs in Narayanghat, and a massive expansion of schools, health services, markets, bus services, cooperatives and employment centers throughout Chitwan (Pokharel and Shivakoti 1986; Axinn and Yabiku 2001).

Figure 3 shows the average walking distance, in minutes, to the nearest public services over time. This average distance is calculated from 171 neighbourhoods systematically selected to represent western Chitwan valley (for details about sampling procedure please see Barber et. al. 1997). The

numbers in the Y-axis in Figure 3 are average minutes to the nearest service and the numbers in the X-axis are the years, beginning from 1953 to 1995. As shown in Figure, there has been dramatic decrease in the average walking distance to the nearest public services over last 50 years. For example, in 1960, residents of western Chitwan on an average had to walk about an hour to reach to their nearest school, whereas in 1990 they could reach to the nearest school after only a 10 minute walk. Similar but more gradual trends are common for other public services such as health services, bus services, markets and employers. This transformation, from an isolated valley to a busy business center and fast-growing valley, has had tremendous impact on the daily social life of communities and individuals.



The massive expansion of services such as schools, health services, bus services, market, employment centers and communication facilities resulted in more young people going to school, working outside the family and interacting with mass media. As a result there has been a sharp increase in school enrolment, 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; Barber and Axinn 2004; Ghimire et al., 2006; Yabiku 2004, 2005).

Hypothesis

As we discussed above, the above setting represents high levels of family organization, with most social activities organized within the family and family system, characterized by arranged marriage, early marriage and a low level of contraceptive use, high marital fertility and extended families. In this setting, increased access to non-family organizations and institutions, such as markets, schools, health care, mass media, and transportation is expected to result in the reorganization of production, consumption, residence, recreation and socialization outside the family. This reorganization of the social activities of daily life alters the costs and benefits of marriage and childrearing, and is predicted to increase age at first marriage, lead to later first birth, promote contraceptive use and lower total fertility.

Data and Methods

The CVFS selected an equal probability, systematic sample of 171 neighbourhoods in Western Chitwan (Barber et al. 1997). Once a neighbourhood was selected, a history of each neighbourhood was collected using a calendar method (Axinn, Barber and Ghimire 1997). At least six group interviews of people residing in the neighbourhood and nearby were conducted to generate information on changes in neighbourhood services and facilities from 1953 to 1995. Furthermore, the information collected on neighbourhood services from these interviews was verified with archival records from local institutions such as schools, health services, and district level government offices.

Following the neighbourhood histories data collection, a household survey was carried out to collect information pertaining to household resources. In addition, a separate survey was conducted to collect information on relationships among households within each neighbourhood. A total of 1,805 households residing within the 171 neighbourhoods were interviewed with a 100% response rate.¹

After the household surveys were conducted, all individuals aged 15 to 59 residing in the sampled households were personally interviewed using a standardized questionnaire and a Life History Calendar (LHC). Also surveyed were respondents' spouses who lived elsewhere or who were outside the age range. A total of 5,271 individuals were interviewed, with a 97% response rate. In the standardized interviews, individuals were asked a variety of questions regarding their family background, personal characteristics, experiences, childhood community context and attitudes about various aspects of social life. In addition, the LHC portion of the survey collected information on residence, marital status, children, contraceptive use, living arrangements, schooling and work experience. Although the LHC uses a more flexible approach to gathering data than structured interview questions, it does collect standardized calendar time

information for various defined domains in predetermined time periods. The LHC provides special advantages for accurate retrospective measurement and sequencing of personal life events (Axinn, Pearce and Ghimire 1999; Belli 1998; Freedman, Thornton, Camburn, Alwin and Young-DeMarco 1988), and the structured interview allows these reported events to be linked to personal and contextual characteristics.

Finally, the CVFS launched a prospective monthly demographic and contraceptive use survey. After the individual interviews were completed in 1997, the CVFS started collecting information each month from the respondent households on demographic events, including migration, living arrangements, marriage, birth, death and contraceptive use. If any original households or respondents moved out of the sample neighbourhood, they were followed, and new individuals and households that moved into the sample neighbourhood were added to the monthly registry system. Thus the CVFS gathered a unique combination of measures designed to provide comprehensive understanding of the dramatic family changes happening in Chitwan.

Results

Our results come from several previous studies conducted using CVFS data during the last ten years. Some of these studies focus on timing of first marriage, some on the arrangement of marriage, some on timing of first birth and some on the timing of contraceptive use to limit fertility. We organize the discussion of these results in the order of our predictions above.

Marital Arrangements

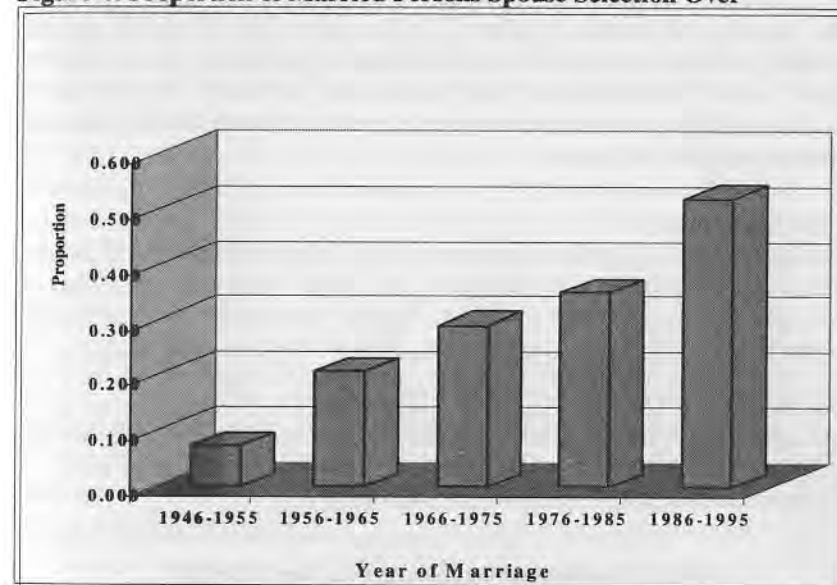
We begin our summary of results by presenting findings from Ghimire, Axinn, Yabiku and Thornton's 2006 study of premarital non-family experiences and spouse choice. In this study the authors both documented the changes in the participation in the selection of a spouse over time and investigated individual level determinants of participation in choice of first spouse. Thus, the dependent variable in their analyses is the degree of participation in choice of first spouse.

Out of the 2,832 ever married respondents interviewed in the CVFS, 65 per cent reported that their first marriages were solely arranged by parents/relatives and the rest of the 35% reported they had either participated to some degree or solely chose their spouse. This suggests that a vast majority of Nepalese still have their spouses solely chosen by their parents and relatives.

In Figure 4 we show change over time in the proportion of married individuals who participated in the selection of their spouse by the year of marriage. Year of marriage, in 10 year marriage cohorts, is along the x-axis and proportion who participated in spouse selection is along the y-axis. The

clear upward trend shows that the proportion participating in the selection of their spouse has increased steadily and dramatically over the past 60 years. None of the people married between 1936-1945 participated in the selection of their spouse, but over half of those married between 1986-1995 did so.

Figure 4: Proportion of Married Persons Spouse Selection Over



To investigate the individual level determinants of participation in spouse choice, instead of using a dichotomy of arranged marriage vs individual choice, Ghimire et al. (2006) treat the choice of a spouse as continuum and focus on the level of respondent participation in the choice of her or his spouse. In order to estimate multivariate models of this ordinal measure of participation in spouse choice, Ghimire et. al. (2006) use an ordered logistic regression estimation technique. For more details about this estimation technique, the measures used in these models, or other aspects of the model specification, please see Ghimire, et al (2006). Our aim here is only to provide a brief summary of the substantive results from these complex multivariate models.

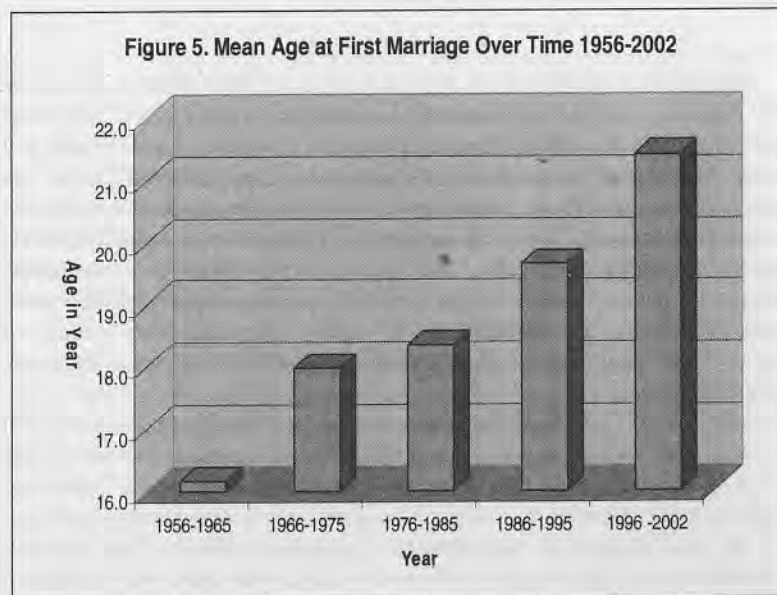
Among the six non-family experiences (school enrolment, educational attainment, non-family work, non-family living, media exposure and participation in youth club) that Ghimire et. al. (2006) investigated, exposure to media and participation in youth clubs both have independent significant effects on the degree of participation in spouse choice. The odds of participation in a higher category of spouse choice for those who scored at the top of the CVFS media exposure index are 54% greater than for those

who scored at the bottom of this index that ranges from 0-3. Likewise, those who participated in youth clubs are 46% more likely to have more participation in spouse choice than those who did not.

The results point toward particularly strong effects of media exposure and participation in youth groups before marriage on participation in the selection of a spouse. The analyses conducted by Ghimire et al. (2006) go on to demonstrate that increased exposure to mass media can account for the vast majority of the cohort change in young people's participation in the choice of their spouse. Participation in youth clubs is also important, but exposure to the mass media is by far the strongest explanatory factor in this watershed change in marital behaviour.

Marriage Timing

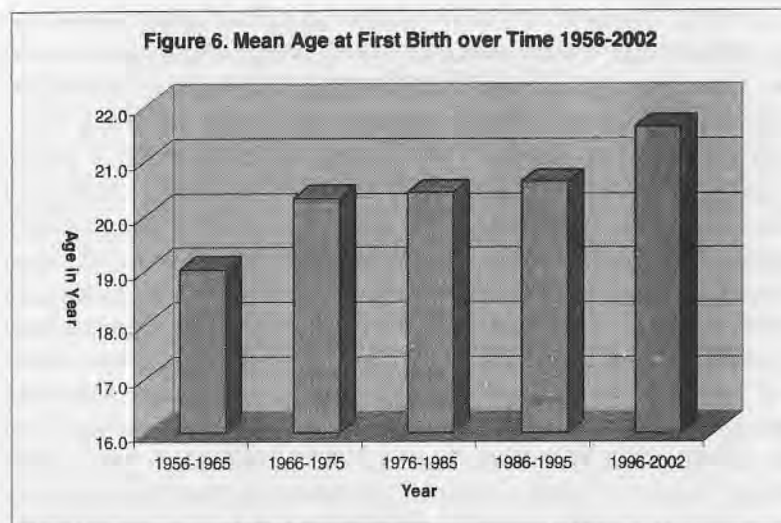
Studies of marriage timing using the CVFS data echoed results of marital arrangement. Similar to participation in spouse selection, mean age at marriage has also increased over time. Figure 5 displays the mean age at first marriage for different marriage cohorts. Year of marriage is along the x-axis and mean age at marriage is along the y-axis. As this figure shows, the mean age at marriage has risen dramatically across marriage cohorts in our study. The mean age at marriage for those married between 1956 and 1965 was just over age 15, but for those married between 1996 and 2002 it was nearly 21 years. This trend is also evident in national surveys.



Using CVFS neighbourhood history calendar, individual interview, and life history calendar data, Yabiku conducted a comprehensive investigation of the factors associated with the timing of marriage as the rate of marriage—factors that increase the rate of marriage speed up marriage, while factors that reduce the rate delay marriage.² His findings are published in a pair of articles on marriage timing (Yabiku 2004 and 2005). In Yabiku's analyses of marriage timing, he found that a broad array of community characteristics, neighbours' and individual's experiences and attitudes have strong effects on the rate of first marriage. Having schools, health services, cinema halls, or bus stops within a 5 minutes walk from the respondent neighbourhood decreases the marriage rate, whereas having an employer or police station nearby increases the rate of marriage. Having neighbours with high education, media exposure, and attitudes favoring late marriage and singlehood all decreases the marriage rate. At the individual level, school enrolment, visits to a health service, and premarital exposure to media each has a strong negative effect on the rate of marriage. For example, among the married women, those who have watched television before their marriage marry at rates 36% lower than the women who have never watched television before their marriage (for details see Yabiku 2004 and 2005). On the contrary, years of schooling and employment in the previous year both increase the rate of marriage.

Age at First Birth

Similar to mean age at marriage, the mean age of women at first birth has also increased over time. Figure 6 displays the mean age of women at first birth for different marriage cohorts. Year of first birth is along the x-axis and mean age at first birth is along the y-axis. As this figure shows, the mean age at first birth has risen gradually across birth cohorts in our study. The mean age of women at first birth for those women who gave first birth between 1956 and 1965 was just over age 19, but for those who gave first birth between 1996 and 2002 it was nearly 22 years.



Using the CVFS measures, Ghimire and his colleagues conducted a detailed investigation of the factors associated with this dramatic rise in the age at first birth. Like Yabiku, Ghimire and colleagues treat the timing of first birth as the rate of first births, investigating factors that increases rates at first birth (speed up birth timing) versus factors that reduce the rate of first birth (delay first birth timing). His results can be found in a series of papers on first birth timing (Ghimire 2004; Ghimire 2006; Ghimire and Axinn 2006; and Ghimire and Hoelter 2006). Ghimire and Axinn (2006) found that having schools, health services and agriculture cooperatives nearby each substantially decreases the rate of first birth. Similarly, Ghimire (2004) found that neighbours' media exposure tends to reduce the first birth rate, while neighbours' marital and childbearing experiences and non-family work increase this rate. Although part of neighbours' influence work through neighbourhood characteristics, both neighbours' experiences and neighbourhood characteristics influence the rate of first birth independent of each other. Similarly, Ghimire and Hoelter (2006) found important impact of local land use on first birth timing. The results show that women from communities with a larger proportion of agricultural land experience first birth at rates higher than those women living in communities with a smaller proportion of agricultural land. On the contrary, women living in communities with a larger proportion of land area under public infrastructures gave first birth at rates lower than those women who lived in neighbourhoods with a smaller proportion land area devoted to public infrastructure.

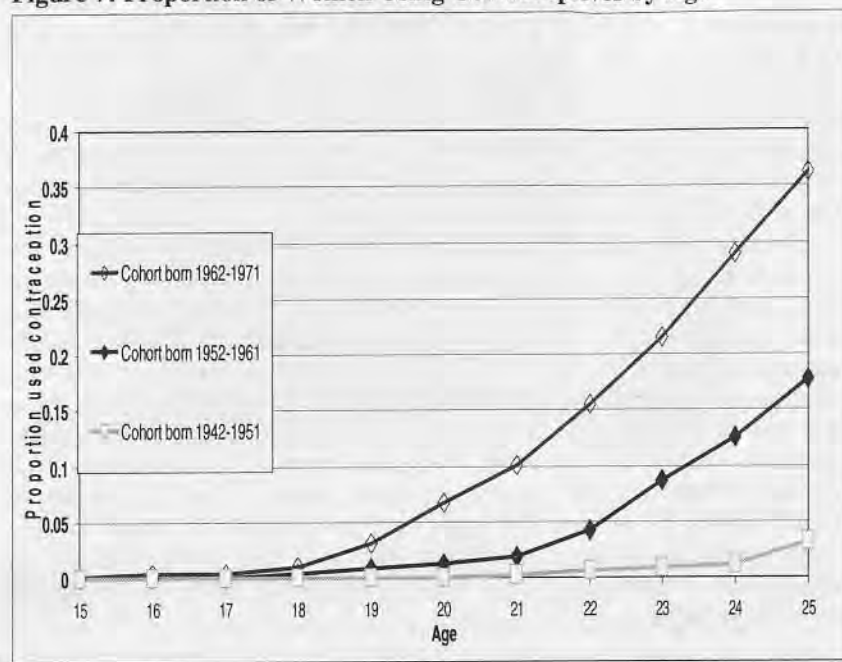
At the individual level, Ghimire (2006) found that the individual experiences of wives and husbands both have independent effects on first birth timing. For wives, higher age at marriage, non-family work experience, educational attainment, and media exposure all tend to increase the first birth rate, while participation in husband selection, school enrolment, and contraceptive use tend to reduce this rate. For husbands, participation in selection of a wife, educational attainment, and media exposure increase the rate of first birth, while school enrolment reduces it.

Together, findings of these studies provide empirical evidence for dramatic family change from parentally arranged marriages at young ages and young motherhood to increasing participation in spouse selection, and older age at marriage and childbearing. These changes in Nepalese family patterns are greatly influenced by ways in which individuals' social activities are organized within the family versus outside the family. For example, those who enrolled in school are more likely to delay marriage and childbearing. Similarly, participation in youth clubs and exposure to mass media each strongly encourages participation in spouse choice. What this means to Nepali society is, as more and more Nepalese continue to engage in non-family activities, and spend more time outside of their family, they will be more likely to adopt these new family patterns that were not historically common in Nepal.

Contraceptive Use

Finally, we summarize the findings from another set of studies (Axinn and Barber 2001; Axinn and Yabiku 2001; Barber and Axinn 2004; Brauner, Axinn and Ghimire 2004), which are a part of CVFS studies on contraceptive use to limit childbearing. Contraceptive use behaviour has also changed dramatically in Chitwan. In Figure 7 we show the proportion of women at each age, with at least one child, who has ever used a contraceptive method to stop having children, by cohort. Age is along the x-axis and the proportion of women is along the y-axis. Among the cohort born in 1942-51 (ages 45-54 in 1996), less than 5% had used contraception to terminate their childbearing by age 25. Yet among the cohort born in 1962-71 (ages 25-34), more than 35% had used contraception to terminate their childbearing by age 25. Of course, many in the 1942-51 birth cohort eventually went on to use birth control (49% by age 45), but the large differences across cohorts demonstrates a tremendous change in the pace of adopting contraception.

Figure 7: Proportion of Women Using Contraceptives by Age



Axinn and Barber (2001) examine the consequences of access to schools, women's own schooling, husband's schooling and children's schooling on the rate of contraceptive use in Chitwan. They find that living within a one-hour walk of a school during childhood substantially and significantly raises the odds of limiting childbearing in adulthood. Women who lived nearby a school during their childhood have 41% higher odds of adopting a permanent contraceptive method during any one-year period, given that they have not already done so. More importantly, this effect is independent of the effects of community characteristics. Living near a school during *childhood* increases the likelihood of fertility limitation regardless of whether the woman lives near a school as an *adult*. This effect is consistent with other research indicating that exposure to social change during childhood alters family related attitudes, but exposure to social change during adulthood does not (Barber 2004). Furthermore, Axinn and Barber (2001) also find a strong positive influence of women's, their husband's and their children's schooling on the rate of contraceptive use for stopping childbearing. Overall, Axinn and Barber find the spread of mass education has a strong influence on the transition from unlimited childbearing to the widespread use of birth control to limit childbearing.

Axinn and Yabiku (2001) conducted a parallel study using these same data, but investigated a broader range of non-family organizations and services. They found that childhood community context has long term effects on fertility limitation that are not explained by adult experiences or adult community context. Exposure to non-family organizations and services in childhood significantly increases the odds of using contraceptives to terminate childbearing many years later, in adulthood (Axinn and Yabiku 2001). They also found that close access to non-family organizations and services at the time when contraception decisions are being made significantly increases the rate of contraceptive use to limit childbearing. They find that individuals' own non-family experiences explain part of, but not all, of this effect of the local community context. Overall, the Axinn and Yabiku (2001) results point toward the reorganization of the social activities, from the family to non-family organizations, as the key link between community level contextual change and individual level adoption of birth control to limit family size.

Barber and Axinn (2004) offer a detailed investigation of the role of mass media on fertility preference and behaviour. Their investigation makes several interesting findings. They find that a wife's exposure to radio, movie, television and newspaper are each strongly related to positive attitudes toward contraceptive use, preferences for smaller family size, weaker son preferences and higher rates of permanent contraceptive use. More interestingly, among the four media sources they investigated, exposure to movie and radio have strong independent effect on permanent contraceptive use.

In a more recent study of the impact of the spread of health services on contraceptive use, Brauner and her colleagues similarly find the important effect of access to health service providers on permanent contraceptive use. The findings also indicate that besides simple access to contraceptive methods, other health services offered by these health service providers also influence the rate of contraceptive use in this setting. Brauner and her colleagues found that both the provision of contraceptive methods and maternal and child health services have independent effects on the rate of contraceptive use to end childbearing. For example, the provision of child vaccination services increases the rate of contraceptive use to limit fertility independently of family planning services.

Discussion

Using the unique and comprehensive measures created for the Chitwan Valley Family Study (CVFS), a team of researchers have documented dramatic changes in family formation behaviours that are taking place in Chitwan. The findings of these studies show that more and more Nepali youth are embracing new marital and childbearing behaviours that were

almost non-existent a few decades ago. More young people are taking part in the selection of their own spouse, marrying at older ages, starting childbearing later and limiting their fertility. These are monumental changes within the lifetimes of the current residents of Chitwan valley, making the family experiences of young people much different to those of their parents.

In addition, the results of these studies reveal many of the key forces operating to produce these changes. The evidence we summarize here focuses on effects of childhood and contemporary community contexts, as well as both the experiences and attitudes of neighbours and individuals. These findings suggest an important interplay between the structural and ideational forces producing these changes. The empirical evidence points toward the spread of mass media, participation in youth groups, education in schools and the spread of non-family organizations and services including schools, employment centers, markets and health services as key factors increasing participation in spouse choice, age at marriage, age at first birth and contraceptive use to limit childbearing.

Perhaps more importantly, these analyses indicate that the dramatic changes in the families and family behaviours in this agrarian society have been influenced by factors at both the individual level and the contextual level. Rarely has any research on family change been able to provide such a comprehensive investigation of the influence of both the individual and contextual factors from a single setting. Research in Chitwan suggests that even in a society where family and kinship institutions are very strong, young people are aware of and greatly influenced by the new experiences outside of family, and the behaviour of people and institutions around them.

In terms of theoretical implications, the evidence provided here is consistent with the modes of social organization framework which suggests that both the structural and ideational aspects of individuals' life circumstances are important parts of their decision-making processes. The important effects of childhood community context found in these studies is consistent with theories of childhood socialization that suggest that individuals construct their family building plans early in life and stick with those plans (Coleman, 1990; Easterlin, 1987; Elder, 1974, 1977, 1983; Mead, [1934] 1967). On the other hand, the strong effects of the characteristics of the contemporary community context we find in these analyses support the microeconomic views, which emphasize the cost-benefit tradeoffs perceived at the *time* of family building decisions (Becker 1991; Coleman 1990; Easterlin and Crimmins 1985; McNicoll 1980, 1984; Notestein 1953). As with many dimensions of social life, it appears that both early life socialization and later life opportunities and constraints are involved in reshaping family processes in Chitwan (Axinn and Yabiku 2001).

In addition to their theoretical implications, these findings have important implications for policies aimed at reducing population growth in societies

undergoing rapid social, economic and institutional change in a context of persistently high fertility in general and Nepal in particular. The findings of these studies go beyond the previous research findings in terms of understanding the mechanisms through which social, economic and institutional changes influence individual behaviour and providing new directions for public policy.

First, numerous studies in the past have shown a strong association between the spread of mass education and fertility decline around the world. As a result, policy makers from the poorer parts of the world have often taken mass education as a panacea for social problem, including reducing the population growth. However, empirical evidence from more detailed studies including the results of our own studies, indicate that the human capital young individuals accumulate from educational attainment actually speeds up marriage (Thornton, Axinn and Teachman 1995; Yabiku 2004 and 2005) and the beginning of childbearing (Ghimire 2003, 2006), once they are out of school. Only school enrolment reduces the rate of both marriage and first birth (Yabiku 2004 and 2005, Ghimire 2003 and 2006). On the other hand, some dimensions of mass education, particularly exposure to school in childhood, men's education, and sending children to school, have strong consequences increasing the use of contraception to limit fertility. Population policies aimed at reducing fertility by postponing marriage and first birth are likely to be more effective if they focus on keeping young people enrolled *in* schools. Population policies aimed at increasing the use of contraception to limit family sizes are likely to be most effective when emphasizing the enrolment of young children in primary education, particularly first born children.

Second, Ghimire's findings of shorter first birth intervals among the individuals who have chosen marriage and married at older ages, with a very low level of contraceptive use before first birth, casts doubts about the intended impact of late marriage on age at first birth and total fertility. Indeed, empirical evidences from other settings including Korea, Malaysia, Taiwan and China (Rindfuss and Morgan 1983; Wu 1996; Wu and Martinson 1993) suggest that the increase in participation in spouse selection and age at marriage may actually increase coital frequency, leading to a shorter first birth interval. Thus, these findings suggest that to achieve the intended goal of lowering the total fertility, programs that are designed to encourage independence in selection of spouse and later marriage will have to be combined with family planning programs to increase contraceptive use. Third, mass media has been identified as another important force behind the steady decline in total fertility around the world. The results presented above show the strong influence of mass media on family and fertility behaviours in two opposite directions. Exposure to mass media, particularly seeing movies (the most popular source of mass media in this setting) is found to be strongly

related to the ideas of youth independence (spouse selection), love, romance and sexuality. As a result, exposure to media in Chitwan encourages marriage and early childbearing. On the other hand, evidence from Chitwan also demonstrates that exposure to media is strongly related to positive attitudes toward contraceptive use, preferences for smaller family size, weaker son preferences and higher rates of permanent contraceptive use. Although exposure to mass media encourages preferences and behaviour related to lower fertility, it is mostly geared toward stopping childbearing. So, from the perspective of policies and programs aimed at reducing population growth, media exposure in rural Nepal may be having mixed effects, speeding up the initiation of childbearing, but also increasing contraceptive use to end childbearing. If mass media were also targeted at delaying the entrance into childbearing, including the use of temporary contraceptives to delay the first birth, the consequences for population growth would likely be even stronger.

Finally, social scientists and policymakers alike increasingly emphasize the important role of the social context in shaping both marriage and childbearing processes (Bongaarts and Watkins 1996; Hogan and Kitagawa 1985; Lloyd and South 1996). The results presented above indicate that both the individuals' social milieu (neighbours' experiences and attitudes) and the structural context (local opportunities and constraints) have important influences on the timing of marriage and childbearing in Chitwan. Thus, these findings suggest that population policies and programs aimed to encourage later family formation and lower fertility may be able to affect behaviour by changing the local social context.

This paper attempts to summarize the findings of multiple studies that were launched over a decade. By necessity, this summary is an incomplete accounting of the many important aspects of the original research we report. We strongly encourage interested readers to take full advantage of the original studies we summarize by reading the papers we cite. The summary of findings we present here serves to pull together a wide range of findings into a single picture of family and fertility change in rural Nepal. The findings we report help to fill a gap in existing knowledge about the factors affecting family and fertility change in rural Nepal—a gap identified in the Population Policy and Programs of Nepal's Tenth Five Year Plan (2002-2007) as an extremely high public policy concern. Furthermore, several of the findings we report here provide empirical evidence to help guide Nepal's population policies and programs. In the face of only moderate declines in marital fertility, these findings should help to provide important insights into the factors associated with continuing moderately high levels of fertility and those factors mostly likely to lead to additional reductions in fertility.

Notes

1. To learn more about the details of the data collection, please visit <http://perl.psc.isr.umich.edu>
2. All analyses of timing of events (marriage, birth and contraceptive use) feature hazard models drawing on measures from the Life History Calendar described above. Because our study design features individuals who are clustered together in neighbourhoods, all of these hazard models are estimated using techniques designed to correct standard errors for within-neighbourhood clustering. For readers interested in learning more about the specific techniques used to estimate these models, or details of the models themselves, we urge them to consult the original papers, or the paper describing the estimation techniques we use (Barber, Murphy, Axinn and Maples 2000). Our focus in this paper is on summarizing the substantive results of these other studies, so we will not address issues of modeling and estimation in any detail.

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