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OLD-AGE SECURITY, RELIGIOUS CELIBACY, AND AGGREGATE FERTILITY IN A TIBETAN POPULATION

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Using the family system as a framework, this study investigates the connection between old-age security concerns and aggregate fertility in Sama and Lho, two ethnically Tibetan villages of highland Nepal. The microdemographic approach reveals a difference in family systems between the two villages that results in Sama having a significantly lower level of fertility than Lho. The key difference lies in the practice of Sama's (but not Lho's) householders of designating a daughter to be a nun, a strategy meant to retain female labour within the household and thereby guarantee a caretaker in old age. Although the effect of this practice on individual fertility is unclear, the comparison with Lho reveals how it sharply curtails aggregate fertility by preventing nearly one in five women from marrying. In this case the motivation to ensure old-age security acts as an unintentional preventive check on population growth. Comparisons with other societies illustrate how the population of Sama combines elements of both the historical European and Asian demographic experiences.

The contrast between Asian and European household formation systems and demographic processes has a long academic history (e.g. Malthus 1933; Davis 1955; Hajnal 1965, 1982; Goody 1996; Skinner 1997). Hajnal's (1965) seminal hypothesis proposes that a cultural pattern in northern Europe characterized by late marriage and high rates of celibacy resulted in relatively low fertility, in contrast to Asia where the joint family induced high fertility through early and universal marriage and the sharing of childrearing costs within multigenerational households. Hajnal's generalizations have not always held up to critical scrutiny in case studies from Europe (e.g. Guinnane 1991; Kertzer and Hogan 1991) or Asia (Das Gupta 1995; Lee and Campbell 1997; Lee and Wang 1999). Nevertheless, the assumption persists that population growth was historically restrained by preventive checks (through low fertility) in Europe and by positive checks (through high mortality) in Asia (Das Gupta 1995).

A related assumption is that, in societies where children are the primary caretakers for the elderly (i.e. in joint family systems such as those found in Asia), old-age security concerns provide an inducement to high fertility, a proposition that is related to Caldwell's (1976) hypothesis that having many offspring is rational when wealth flows from children to parents. Nugent (1985) has made the most systematic attempt to understand the connection by setting forth eight conditions under which the old-age security motive

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could lead to high fertility.[1] Most of the conditions relate to macro-economic issues, such as the development of capital markets and social security programs, whereas others centre on socio-cultural factors, such as the loyalty of children to their parents and cultural perceptions about the importance of the aged.

Asia has provided fertile ground for debating the relationship between high fertility and old-age security. Whereas Cain (1981, 1991) and Dharmalingam (1994) tentatively identify a positive connection in South Asia, Vlassoff (1990, 1991) finds little evidence to support the hypothesis. Indirectly Niraula and Morgan (1995) substantiate the connection in a Nepalese Hindu community, finding that contraception use is associated with the number of surviving sons in the family because a primary motivation for having a son is to provide old-age support. In the context of rapidly declining fertility in East Asia some scholars (e.g. Han 1994; Johnson 1996) have made the hypothetical connection between old-age security concerns and skewed birth ratios induced by sex-selective abortion, since it is sons and not daughters who take care of parents. Jiang (1995) argues that, unless China's government implements a formal social security program, a huge burden will be incurred by middle-aged children since fewer of them will be available to support aging parents. Yet Zhao's (1998) simulation study indicates that this need not be the case, since the steep decline in mortality means that more parents in the future than in the past can expect to have a son to care for them. In contrast, fertility in Europe was assumed to have been decoupled from old-age security concerns through the existence of public institutions that could care for the aged (Hajnal 1982; McNicoll and Cain 1990).

Where do Tibetan societies fit into the debate? For one thing, they have long been viewed as an exception to the 'Asian' demographic pattern due to the existence of preventive checks that operate through fraternal polyandry (the marriage custom whereby brothers share a wife) and concomitant low levels of nuptiality for females (Malthus 1933; Turner 1991). More recent research reveals how polyandry, a strategy that is primarily invoked to avoid excessive land partitioning, in combination with high mortality helps sustain relatively low (if any) population growth rates in contemporary Tibetan populations of the Himalayas (Goldstein 1981; Levine 1988; Wiley 1998). In general, Tibetan societies exhibit traits reminiscent of both the Asian and European systems, with low ages at marriage for women (as in Asia), yet with marriage being far from universal (as in Europe). As for the connection between old-age security and fertility, however, very little has been written.

To address the issue, this study takes as a point of departure the premise that family systems help shape demographic processes. Rather than focusing on polyandry, the dominant paradigm of research centring on Tibetan populations, this study uses microdemographic approaches (e.g. Caldwell, Hill and Hull 1988; Axinn, Fricke and Thornton 1991) to analyse the social and demographic implications of female celibacy in Sama, a Tibetan enclave in highland Nepal. Specifically, the study explores the social roles of nuns in this setting, including the rationale behind decisions made by parents to relegate their daughters to lives of celibacy, and the implications that such decisions have on aggregate fertility.[2] In Sama daughters are designated by parents to be nuns not so much for their value as religious practitioners, but more in order to retain female labour within the household and ensure that someone is available to take care of them in old age.

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[1] The conditions are: (1) underdeveloped capital markets, (2) uncertainty about the accumulation necessary for old age and disability, (3) absence or inefficiency of insurance programs, (4) loyalty of children to their parents, (5) absence of markets for nonstandard labour, (6) underdeveloped markets for the goods and services that elderly people consume, (7) absence of a young spouse, and (8) perception of the relative importance of old age (Nugent 1985).

Stecklov (1999:1) observes that most studies dealing with the old-age security and fertility hypothesis rely almost exclusively upon qualitative data. Verifying the connection is difficult, as Cain notes: 'I do believe that security concerns motivate fertility decisions, but neither I nor anyone else have provided much evidence on motivations ...' (Cain 1991:519). My purpose here is to address the motivating factors from a slightly different angle by arguing that the connection between old-age security and fertility can be completely unintentional, yet nevertheless quite significant in quantitative terms. Instead of trying to track intergenerational wealth flows to prove the hypothesis, this study looks first at how parents in Sama envisage old-age security, and what steps they take within the household development cycle to assure that they will be provided for during their later years. Afterwards the fertility implications are assessed, not at the individual level but at the community level. The investigation centres on the cumulative effect on fertility of decisions made within the context of old-age security concerns. Demographic data are presented to demonstrate how the old-age security motive acts as a buffer in this case, a sort of unintentional Malthusian preventive check on population growth, by removing a significant percentage of women from reproductive activities.

The ethnographic setting

Access to the remote Nubri Valley, an ethnically Tibetan enclave situated in the highlands of Nepal's Gorkha District, is impeded by deep gorges to the south, and by 5000-metre high passes to the north and west. The economy of Sama (elev. 3350 m), the largest village in the valley, combines agriculture, the herding of bovines, and trans-Himalayan trade.

Sama has been continuously inhabited for a least 400 years. An important lineage of married Buddhist lamas migrated there during the early seventeenth century, bringing with them a form of household-based Buddhist practice. The lamas, referred to as Ngabda (*mnga' bdag*, 'possessing power') because of their genealogical connection with the mediaeval emperors of Tibet, adhere to the teachings of the Nyingmapa sect which does not require celibacy among male religious practitioners. Most clerics in Sama do not reside within a formal monastic institution. Rather, they live in the village or in privately owned houses at Pema Chöling, a temple complex situated on a ridge ten minutes walking distance from the village. Pema Chöling was established more than three centuries years ago by a lama belonging to the Ngabda lineage. Today the temple is surrounded by small homes inhabited by lamas, celibate monks, nuns, and elderly people who have retired from village life.

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[2] Female religious practitioners in Tibetan societies have been studied primarily from feminist perspectives centring on Buddhist cultural ideals (e.g. Tsomo 1989; Klein 1995; Campbell 1996). Very few studies have been devoted to the socio-economic dimensions of female religious celibacy (Fürer-Haimendorf 1976; Havnevik 1989; Gutschow 1997).

In 1997, the *de facto* population of Sama consisted of 225 males and 256 females (481 total), whereas the *de jure* population included 272 males and an equal number of females (544 total). Most of those counted in the *de jure* but not the *de facto* figure are celibate monks and nuns who currently reside in Kathmandu or India at monasteries run by Tibetan refugees. Women who marry out of the village relinquish all jural rights, and are therefore excluded from both figures.

The village of Sama shares many demographic characteristics with other ethnically Tibetan parts of the Himalayan region. Polyandry is practised, albeit less frequently than in some parts. In Sama 23 per cent of marriages are polyandrous; this is compared with nearly 50 per cent in parts of Tibet during the 1950s (Goldstein 1971) and among the Nyinba of western Nepal (Levine 1988), less than 40 per cent in Tsang, Nepal (Goldstein 1976), and less than 20 per cent in Baragaon, central Nepal (Schuler 1987). The level of fertility in Sama (GFR 148; TFR 5.3) is close to the average for mountainous regions of Nepal inhabited by Tibetan or similar peoples (Pradhan *et al.* 1997:38), although it is significantly higher than levels found in Ladakh, northwest India (TFR in the 1980s between 3.25 and 4.15, Wiley 1998:467) and lower than among the Nyinba (GFR in the 1970s of 235, Levine 1988:290). Infant mortality tends to be high in Tibetan communities. Sama's infant mortality rate of 229 per thousand is very high compared with an average of 137 in mountainous regions of Nepal (Pradhan *et al.* 1997:104), and with a rate of 94 in Tibetan parts of China in 1990 (Sun and Li 1996), but is very similar to rates among the Nyinba in the 1970s (Levine 1987:289).

Family systems and the household development cycle

Several anthropologists have noted that family and household typologies range in utility from being analytically bereft to highly misleading (e.g. Hammel 1984; Wilk 1991; Fricke 1994; Skinner 1997). When families and households are classified according to a static typology, their inherent processual natures are veiled (Wilk and Netting 1984), and the roles of individuals within households are obscured (Alter 1988:65). These two points are critical, for without an understanding of how the household develops through time, and the potential roles that individuals can occupy within the household, it is difficult to say anything meaningful about how various systems affect demographic processes.

Skinner's contribution to the study of family systems, defined as the normative manner in which family practices and household dynamics occur, including marriage forms, succession, and inheritance (Skinner 1997:54), is used here as a guiding template for understanding Sama's household development cycle. Skinner starts with a typology based on the most fundamental building block of the family, the conjugal unit, which consists of any two of the following three elements: husband-father; wife-mother; and child or children. A conjugal family consists of only a single conjugal unit; a stem family has two or more conjugal units, but no more than one per generation; and a joint family consists of two or more conjugal units with at least two being in the same generation. From a diachronic perspective the conjugal family system implies neolocal marriage; equal inheritance among offspring (or among one sex) and absence of succession *per se*; a usual sequence of coresidential arrangements in which an extended period with children is preceded and followed by the couple being alone; family formation occurs with marriage;

and family extinction occurs with the deaths of the married partners. In the stem family system a spouse is brought in for only one offspring in each generation; succession is to the married offspring who has remained within the household; an unequal inheritance favours a single heir; and an alternation occurs between conjugal and stem phases. Finally, the joint family system means that spouses are brought in for each member of one sex; inheritance is equal for the favoured sex; succession is generally absent; the domestic cycle includes conjugal, stem, and joint phases; and fissions into two or more families can occur (Skinner 1997:54-63).

In Sama all those who dwell under the same roof are typically members of the same family, so it is not necessary to make fine-tuned distinctions between the terms household and family. Each household is headed by a person, usually the most senior male resident, who is ultimately responsible for assuring that all ritual and economic obligations in relation to the village are fulfilled. Sometimes the head of the household is a female, for example widows or divorcees with young children, unmarried women such as nuns and spinsters, and women who have matrilocally resident husbands in cases where there are no male siblings.

Table 1 shows that the majority of Sama households are conjugal families, a minority are stem families and joint families do not occur. About a quarter of households do not fit Skinner's family typology at all since they lack a conjugal unit. Most of these are households consisting of celibate monks and nuns who either maintain solitary abodes or share houses with siblings who are also monks or nuns, and spinsters, widows, or widowers who do not live with siblings or children. Most of these cases (e.g. widows, widowers, and nuns) represent the tail ends of household development cycles, as discussed below. Only about ten per cent of the population of Sama live in households lacking a conjugal unit, compared with 70 per cent in conjugal households.

Table 1 Distribution of family types in Sama

Family type	Number of households	Per cent of households	*De facto* population	Per cent of population	Persons per household
Conjugal	87	62.2	340	70.2	3.9
Stem	17	12.1	99	20.5	5.8
Other	36	25.7	45	9.3	1.3
Total	140	100.0	484	100.0	3.5

Source: Childs (1998).

Stem family households account for roughly 12 per cent of all households and 20 per cent of the population. Despite its small representation, a diachronic perspective reveals that the stem family system is actually normative in Sama. Ideally the household development cycle is characterized by oscillations between conjugal and stem phases that inevitably result in the formation of multiple conjugal households. The cycle can be summarized as the following sequence of events. (1) Spouses marry and begin residing in the groom's natal home with his parents and unmarried siblings (stem phase).[3] (2) Once their first child is born (on average three years after marriage) the young couple inherit a portion of the groom's father's land and bovines. They are then expected to build or renovate and then move into a separate home where their own offspring set will develop (conjugal phase). (3) Alternation commences between stem and conjugal phases as successive sons marry and bring home their brides (conjugal to stem), and then establish separate residences following the births of their own first children (stem to conjugal). (4) The youngest son marries and inherits the parents' home. The parents then commence a final conjugal phase by moving into a retirement home, usually on the temple grounds at Pema Chöling just outside the village.

Thus, Sama's family system fits somewhere between Skinner's stem and joint classifications, albeit the end product is several conjugal families. Even though all members of a single generation (males) can theoretically marry and inherit household assets equally, characteristic of a joint system, each son is expected to form an independent household before the subsequent son's marriage. There are never two conjugal units of the same generation present in the household at the same time. Therefore Sama represents a case of the 'hiving off' variant of the stem system (Keyes 1975; Skinner 1997), and is consistent with other populations found in Tibet and the Himalayas (e.g. Goldstein 1971; Levine 1988; Fricke 1994).

Caring for the aged in Sama

In Tibetan societies old age is considered a stage of life that should be dedicated to prayer, the purpose being to positively influence one's future rebirth through the accumulation of merit. In Sama the aged are esteemed for their experience and religious devotion. Nevertheless, cultural ideals often clash with economic realities, for whereas age commands respect, it also entails a certain degree of dependency that can lead to intergenerational discord. Old men in Sama often lament the fact that their advice is ignored and the care they receive from children, especially sons, is inadequate. Married sons, although they do provide some material support for their old parents, devote most of their energies to sustaining their own developing families. Unmarried sons such as monks are usually sent to live in distant monasteries among the Tibetan refugee communities of Kathmandu and India, and therefore are not in a position to provide much support. Married daughters are ill-suited to caring for aging parents. Marriage results in a transfer of labour from a woman's natal household to her marital household, and therefore caring for her parents would place a woman in direct competition with her new family. From the parents' perspective an unmarried daughter, such as a nun, is the most suitable to provide old-age security, for she can still reside in her natal household until her parents die.

The normative end result of the household development cycle is that old parents are removed from village life and live out their final days in small retirement homes on the temple grounds of Pema Chöling. Despite the move to a retirement home, they do not necessarily end up without family support, for in anticipation a daughter is designated to be a nun as insurance against being neglected in old age. Unmarried women, usually nuns, are the primary caretakers for the aged in Sama.

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[3] Although patrilocal residence is the norm, all three types of postmarital residence (patrilocality, matrilocality, and neolocality) are options in Sama. Most marriages result in the bride moving in with the groom, whether in his parent's house (patrilocality) or in a new home of their own (neolocality). In the rare cases where parents lack sons, they bequeath their possessions to a daughter, and the daughter's husband will reside matrilocally.

Cultural reasons for relegating a daughter to the nun's life of celibacy are compelling. One sure way to gain substantial religious merit is to donate a child to the religious order. On the other hand, many people (including senior lamas who initiate nuns) confide that such women are viewed more as household servants than religious practitioners. Nuns are often encountered in the village carrying younger siblings on their backs, working in the fields of their brothers, gathering firewood, and so forth. During the summer months most nuns move to a high temple complex at the base of Pungyen, the mountain upon which the village's protective deity lives. They do not go there for reasons of religious retreat; rather, they are there to assist their kin with herding and butter production during the annual movement of cattle to the high pastures. Nuns refrain from economic activities only on specified auspicious dates when all religious practitioners are expected to perform ceremonies from dawn to dusk. Otherwise, except for her red robes, shaven head, and lack of children, it is difficult to distinguish a nun from a married householder.

The life course of a nun generally follows the same pattern: she is allocated to her religious role while young (generally under ten years of age); lives within the developing natal household during which time she helps care for younger siblings; moves to the temple retirement home with the aging parents after her youngest brother marries and takes over the natal household; and finally lives alone in the temple home, which she legally owns, after her parents die. The nuns of Sama do not live in a convent, but strong cultural prohibitions against nuns engaging in sexual activity help assure their celibacy. The irony is that, having nurtured younger siblings and aging parents, nuns often have nobody to look after them in old age. One blind old nun lamented when I encountered her: 'I would like to serve you tea, but I cannot see and would pour it all over the ground. There is nobody to care for me. I am just waiting to die'.

The following two cases help to illustrate how these nuns fit within the overall household strategy of their parents. Around 1945 the brothers Dorje and Tenzin took Tashi as their bride. Tashi first bore a daughter, Pema, who took her initial vows as a nun around the age of seven. Pema was followed by three more daughters (of whom two died, and one is married in Sama) and five sons. Among the sons, the eldest died as a child, the second youngest was made a monk and sent to a monastery in India, and the other three are married in Sama. When the youngest son married, the parents moved from their village home into two adjacent temple residences. Tenzin and Tashi share one residence, while Pema lives with her senior father, Dorje, next door. The reasons for this arrangement are that temple houses are too small for four people to occupy, and that Dorje is now an invalid who needs constant attention. Pema's days are typically spent working the small fields of her parents that were not relinquished through inheritance, and assisting her brothers with their fields during peak agricultural seasons. She must return each day at noon to feed the invalid Dorje and help him with his toilet before going out to work again in the afternoon, and must return each evening to feed him and help him to bed. On days when she does not work in the fields she helps her mother and junior father with chores around their house. Pema has only rudimentary religious training and therefore participates only in those annual ceremonies that require all available participants. Most of the time she is an economically productive member of her parents' and brothers' households.

In the second case, two brothers took a wife in the early 1960s. Soon thereafter she commenced childbearing. The first four children were daughters, all of whom died within months of being born. The fifth child, Tsering, was also a daughter and survived. Tsering was followed by two brothers; one is a monk residing in Kathmandu, and the other is married. Tsering also has a younger sister who is now married in Sama. Tsering was designated to be a nun around age eight, after her sister had been born. As in the case of Pema, Tsering was the first surviving female in the household. In some cases following the death of many infants, parents try to influence their bad fortune by vowing to donate their first surviving child to the religious order. This may have influenced the decision to make Tsering a nun, although the practical concerns of old-age care cannot be ignored as a factor. Furthermore, Tsering was designated to be a nun after her younger sister was born. Therefore, the parents had a daughter (providing she survived) who was not a nun and was therefore free to marry and thereby form new or cement existing social alliances. Cross-cousin marital exchanges are common in Sama, so it is important to have at least one daughter who can be sent out of the household in marriage to help assure that a bride can be brought into the household in this, or the next, generation. At the time of research Tsering's sister was married, and her non-monk brother had recently married and brought his wife home. The household was in the process of division, shown by the fact that the parents were renovating a temple house to use in their retirement. Tsering would go with them when the final move occurred.

Among Sama's population aged over 60, excluding aged celibate monks and nuns, approximately one in three live with a daughter who is a nun, and an equal proportion live with a married or single son. Most of the latter are completing the final phase of the stem family arrangement and hence a move to a retirement home is imminent. Such households often have a nun in residence who will accompany her parents to their small temple home. A further one in four aged people reside alone. Most of these live in temple retirement homes in close proximity to either a daughter or niece who is a nun.[4] Thus, well over half the old people in Sama depend upon a nun for care.

Comparing family systems in Sama and Lho: the nun differential

Not all householders in the Nubri Valley create nuns as frequently as those in Sama. Inter-village diversity becomes evident when comparing the family system of Sama with that of Lho, another ethnic Tibetan village that is closely connected to Sama through social, economic, and cultural ties. Situated a three-hour walk down the valley, Lho is roughly the same size as Sama, but has far fewer nuns. This cannot be explained by cultural factors. The frequency of fraternal polyandry is almost identical in the two villages. Furthermore, both villages engage in a similar diversified subsistence strategy that combines farming, herding, and trans-Himalayan trade. Some differences do exist. Microclimatic conditions and a slight altitude difference mean that Lho plants two crops per year whereas Sama plants only one. Another difference relates to the fact that Lho recently claimed disputed territory between the two villages and opened up new fields (Childs 2001), so that many households now exploit three productive regions (the village fields, the newly opened fields, and the high pastures) during summer months, as opposed to only two in Sama. However, this difference does not explain the nun differential since it is only a recent development.

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[4] It is common for nieces to retain close socio-economic connections with their father's brothers in Tibetan patrilineal societies. In Sama nieces sometimes help care for paternal uncles who are celibate monks and hence have no families of their own to provide old-age support.

Table 2 shows the respective percentages of the female and male *de jure* populations who are nuns and monks living within the village, or in monasteries and convents run by Tibetan refugees in Kathmandu and India. This reveals a distinction in family management strategy between the two villages. Both export monks to Kathmandu and India at about the same rate. Sending a monk outside of the village is advantageous at the household level since if this is done there is one fewer potential claimant on parental assets, so those sons who remain can expect a more sustainable inheritance. Furthermore, monks can be counted upon to send their parents cash remittances, gained from performing household rituals for Tibetan refugee families. Because of gender biases inherent within Tibetan Buddhist communities (Havnevik 1989), female religious practitioners have few such opportunities, so they are not exported in great numbers from either village. Nevertheless, parents in Sama create far more nuns than parents in Lho, and unlike monks, retain such daughters within the village.

Table 2 Percentage of female and male *de jure* populations who are nuns and monks by residence, Sama and Lho

		Living in village	Living elsewhere	Total
Nuns	Sama	15.5	3.4	18.9
	Lho	2.3	4.6	6.9
Monks	Sama	4.8	14.4	19.2
	Lho	1.7	14.9	16.6

Source: Childs (1998).

One reason for the nun differential is the fact that Sama has a resident population of married lamas (the Ngabda clan members) who are not only the focal point of village religious ceremonies, but who are required to induct girls into the order. Lho has no such clerics, but must rely upon Sama's lamas for everything from the performance of communal festivals to death rites. An economic incentive exists for lamas to initiate monks and nuns, since once initiated the individual owes a specified number of labour days to the lama's household.[5] In this way a married lama commands a larger labour force than that available from his immediate family. Technically Sama's lamas could initiate females from Lho but there is little incentive to do so because their relative physical distance means that the chance of benefiting from the labour reciprocation is minimal.

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[5] This also helps to explain why more monks remain in Sama than in Lho (see Table 2). One father complained that the reason why he is unable to send his son to a monastery in Kathmandu is that the lama who initiated the boy is reluctant to relinquish that monk's labour.

One resulting contrast in the family system is that, whereas in Sama the old people retire to the temple complex with their nun-daughter, in Lho they move into a smaller home attached to their son's house. Sons, and not daughters, are the primary caretakers of the aged in Lho.

The existence of the married lama lineage in Sama but not in Lho accounts for the difference in old-age care systems. This factor has more to do with historical migrations than with cultural changes resulting from contacts between Hindu and Buddhist cultures. A process whereby 'tribal' peoples of South Asia assimilate to the dominant Hindu culture, a process often referred to as Sanskritization (Srinivas 1989), has been documented throughout Nepal (e.g. Jones 1976; Höfer 1979). However, the distance between Sama and Lho is only a three-hour walk, whereas the distance between Sama and Kathmandu is a six-day walk across difficult terrain. Contact with other ethnic groups of Nepal, especially Hindu groups of the lowlands, does not differ significantly between the two villages, and hence cannot account for the difference in family systems between the two villages.

A wide range of old-age care systems has been found among Tibetan populations. For example, the system in Sama resembles the 'large house and small house' (*khang chen khang chung*) system in Ladakh whereby when sons marry the parents relinquish the estate and move into a smaller house, often with an unmarried daughter (Crook 1994:477-496). Yet it could be argued that this system is more similar to practices in Lho, since the large house and small house of Ladakh still function economically more or less as a single household. Among the Sherpas of Khumbu many elderly people retire to small homes at a nunnery (Fürer-Haimendorf 1964), whereas the people of Yolmo (Goldstein 1980; Bishop 1998) and Baragaon (Schuler 1987:62-63) generally coreside with and are dependent upon married sons. However, in some cases daughters postpone or forsake marriage altogether in order to care for their aging parents. In return, they can expect to inherit some land that otherwise would be passed on to sons (Schuler 1987). Recent research on the historical demography of the Tibetan district of Kyirong reveals a variety of responses to old-age care. Some old parents lived with their married sons, whereas others moved with unmarried daughters into a 'side house' (*zur khang*) or a 'dwelling for the elderly' (*rgan tshang*) after their sons married (Childs 2000). On the basis of these brief comparisons, it is difficult to judge whether Sama or Lho exhibits a more typical pattern of Tibetan old-age care.

A demographic consequence of Sama's family system

The fertility consequence of creating many nuns becomes clear when demographic data for Sama and Lho are compared. Table 3 demonstrates that the total fertility rate in Lho (7.0) is significantly higher than that in Sama (5.3), a difference of 1.7 births per woman.[6] Eliminating nuns, which effectively yields the total marital fertility rate, results in 7.2 births per woman in Lho and 6.5 in Sama. Thus, the effect of nuns on fertility levels is 1.2 births per woman in Sama but only 0.2 in Lho, and 1.0 of the inter-village difference of 1.7 births per woman can be attributed to nuns. The tendency for Sama's householders to

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[6] To compensate for small numbers and annual fluctuations in births, fertility and mortality data in this paper are averages for 1990-96.

Table 3 Comparison of Sama and Lho total fertility rates, 1990-96

	Sama	Lho	Inter-village difference
TFR including nuns	5.3	7.0	1.7
TFR excluding nuns	6.5	7.2	0.7
Effect of nuns	1.2	0.2	1.0

Source: Childs (1998).

create an abundance of nuns for old-age care thus has a greater effect on the fertility difference between the villages than all other ecological, nutritional, demographic and socio-economic factors combined.

These other factors account for a differential of 0.7 births per woman. Although altitude can affect fertility (Beall 1983; Moore 1983), the fact that Sama lies a mere 170 metres higher than Lho (3350 m versus 3180 m) is probably not enough to account for much fertility differential. Furthermore, the effect of nutritional differences is unclear, since although Lho has better agricultural land, Sama residents have larger bovine herds. The remaining fertility difference may be more related to demographic and social factors. Lho has a lower female age at first marriage (19.9 versus 20.5 years) and age at first birth (22.8 versus 23.7 years), but these factors may be partially offset by Sama's slightly higher infant mortality rate (229 versus 208 per 1000 live births).[7] Furthermore, the difference in marital fertility may relate to the old-age security and fertility hypothesis. Becker (1988) posits that bequests from parents to children provide a more secure tie between the generations than social norms. The implication is that inheritance can be used as a bargaining tool by the aged to ensure the loyalty of children (see Nugent 1985). Unlike the situation in historical Europe, parents in Sama and Lho effectively lose their bargaining power once their sons marry, for that is when the intergenerational transfer of assets occurs. Sons are henceforth not beholden to their parents in any economic sense. Nuns, however, cannot marry and attain economic security through a husband. Their loyalty is assured because parents hold the key to nun-daughters' independent subsistence: the temple retirement home and a small allotment of land retained for subsistence in old age, both of which the nun receives only after her parents' death. Therefore, old-age security is assured in Sama once a daughter becomes a nun and reaches maturity. On the other hand, sons in Lho are not considered a reliable source of old-age support, a perception that could be an inducement to have more children. The more sons who reach maturity, the more potential supporters parents have in old age.

The significance of female celibacy in population growth is shown in Table 4 where intrinsic rates of natural increase[8] and population doubling times in Sama and Lho are compared. Sama is able to maintain a lower rate of natural increase than Lho through the creation of nuns. The second row illustrates what would happen if nuns were to marry

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[7] The effect of high infant mortality on fertility is evident from the fact that in Sama average birth interval is 34 months following a child that survives for more than a year, but only 21 months following an infant death.

Table 4 Comparison of intrinsic rates of natural increase and population doubling times in Sama and Lho

	Sama	Lho	Inter-village difference
Natural increase (%)			
Actual	0.66	1.48	0.82
If nuns married	1.34	1.57	0.23
Effect of nuns	0.68	0.09	0.59
Doubling time (years)			
Actual	105	47	58
If nuns married	52	44	8
Effect of nuns	53	3	50

and bear children like their householder counterparts. Again, the situation would not result in great changes to Lho's demographic regime, but would have a considerable effect on population growth in Sama.

Discussion

The high frequency of female nonmarriage in Sama is made possible by a combination of social organizational and cultural factors. The family system, the lack of social security for the aged, and attitudes about female celibacy all contribute to establishing a context that is conducive to restricting certain daughters from marriage by making them nuns. Nuns in Sama are by no means left-over women who are unable to find husbands, as is often assumed in studies of polyandrous societies. If this were the case, then nuns would declare their religious intentions well after age 20 when it became apparent that their marital chances were rapidly dwindling. To the contrary, parents in Sama decide the fates of their daughters when the girls range in age from six to ten, a decade or so before an accurate assessment can be made about their marital potential. Although the desire to have at least one daughter as a caretaker may be an inducement to high individual fertility, barring a significant percentage of a cohort's women from reproductive activity curbs aggregate fertility in the subsequent generation. The level of fertility in Sama is partly lowered through a strategy that is meant to ensure first and foremost the social security of the aged.

Sama does not mirror either of Hajnal's (1982) pre-industrial household formation systems. The average age at marriage for women (about 20 years) is significantly earlier (five to eight years) than in nineteenth-century European populations such as Törbel in the Swiss Alps (Netting 1981), Verviers in Belgium (Alter 1988), and Casalecchio in Italy (Kertzer and Hogan 1989), is similar to parts of historical China (Lee and Campbell 1997:84-90), and is later than in many contemporary South Asian populations such as Bihar, India, 18.0 years (Ram *et al.* 1995:53), and Nepal, 17.1 years (Pradhan *et al.*

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8 Calculated according to the method presented in Shryock and Siegel (1976:313-318) using the South Level 6 model life table from Coale and Demeny (1983:386).

1997:81). On the basis of this comparison, Sama resembles the Asian demographic experience more than the European. The level of nuptiality, however, reveals a picture resembling Europe far more than Asia. The fact that about 20 per cent of women in Sama never marry is unusual in South and East Asia. For example 99 per cent of women in Bihar marry by the age of 30 (Ram *et al.* 1995:54), and in China marriage has long been nearly universal for women (Lee and Wang 1999:68). The proportion ultimately marrying in Sama is similar to that in other Himalayan Tibetan communities, for example in Humla (Goldstein 1976; Levine 1988) and Baragaon (Schuler 1987), but is conspicuously low when compared to national figures for Nepal showing that 98 per cent of women over age 30 have ever been married (Pradhan *et al.* 1997:79). In contrast, high percentages of women in historical northern Europe never married, ranging from around 25 per cent in nineteenth-century Iceland (Vasey 1996) and post-famine Ireland (Guinnane 1991), to 20 per cent in alpine Törbel (Netting 1981) and industrial Verviers (Alter 1988), and about ten per cent in Germany around 1900 (Hajnal 1965). Spinsters were a common feature of European society (Watkins 1984), yet were nearly nonexistent in historical Asian societies such as China (Lee and Campbell 1997) and Japan (Cornell 1984). Thus, with regard to marriage, Sama holds half the European equation for preventive checks on fertility and population growth (many celibate women) but lacks the other half (late marriage).

In Europe late marriage and nonmarriage are both attributable to economic necessity, as young people depended upon the inheritance of land in rural settings, and on prolonged apprenticeships and years of toil in urban settings, before acquiring the prerequisite resources to start families. Bequests to children were often delayed until parents were too old or infirm to manage the farm on their own. Old-age security was often assured through legal contracts that stipulated everything from subsistence allotments to whether or not the retired parents could sit by the fireplace (Gaunt 1983). In contrast, the nature and timing of intergenerational wealth transfers in Sama are no impediment to marriage, since the process of partitioning assets occurs in increments as each successive son marries, a process that can take up to two decades. To assure old-age security parents in Sama retain a daughter within the household, and her loyalty is secured on the one hand through cultural prohibitions against engagement in reproductive activities, and on the other hand through the guarantee that she will inherit a house at the temple complex and the land that her parents retained for their own subsistence.

Das Gupta questions the assertion that Asian family systems lacked a 'nuptiality valve' (i.e. preventive checks on population growth that work through marriage such as late age at marriage or high frequency of nonmarriage), and hence populations were regulated far more through positive checks than preventive checks (Das Gupta 1995, 1997). Furthermore, Cain and McNicoll (1990) posit that one major impediment to a marital fertility decline is the fact that, in many societies, the welfare system for the aged is embedded within the family. This may be so in Sama, for children are the only source of old-age security and marital fertility remains high. However, a nuptiality valve does exist in the form of restricting daughters from marriage so that they are available as caretakers for the aged, an arrangement that is possible because there is a culturally appropriate role for celibate women. Population growth is mitigated through a practice that has little to do with intentional Malthusian preventive checks, and everything to do with a rational strategy to retain the labour of daughters who would otherwise marry and be beholden to other households. In this way Sama exhibits a mixture of the European and Asian demographic experiences. The solution to concerns about security in old age results in high fertility within marriage but low aggregate fertility due to female religious celibacy.

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