Connections Within and Between Households in Rural Liaoning, 1789-1909

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Introduction

One of the most frequently noted features of Chinese society is the apparent importance of kinship. In the past, kin networks are supposed to have fulfilled welfare functions that in the West were the province of the state, organized religion, or charity. During times of hardship, households could call upon others in their descent group for assistance. In certain parts of China, households could expect assistance from formal lineage organizations. Well-off individuals who failed to assist less fortunate members of their descent group, especially in times of need, were looked down upon.

The precise nature of the economic links between households in the same descent group remains unclear. Few studies have measured whether or not descent group members outside the household actually mattered in the sense that their number and socioeconomic status affected individual well-being. Anthropologists have focused on the norms and customs associated with descent groups. The formation, roles, and segmentation of corporate lineages in south China, for example, has been the subject of an extensive literature (Freedman 1966). Sociological studies, meanwhile, often take features of descent groups and kin networks for granted, and deduce their implications for economic development and other issues. Only recently have studies begun to appear in either field that examine how individuals make use of kin networks in contemporary China and compare the roles of such networks with those of other personal networks (Yan 1996, Bian 1997).

Studies of the economic links between related individuals in different households are rare not only for China, but for other societies as well. The essential problem is that until recently, the necessary data have not been available. Even though in theory family reconstitution from parish register data might make it possible to identify kin outside the household, measure their characteristics, and examine how they influence individual outcomes, to our knowledge relevant studies are rare. While some studies have made use of sources such as genealogies to study kinship networks in the past, the emphasis has often been on describing how networks formed and then persisted over generations (Sabean 1998). Only recently have some studies begun to appear, mainly in certain European locations (Plakans 1984).

In this paper we investigate whether or not households in the same descent group shared resources in rural Liaoning, China, from the end of the 18th century to the beginning of the 20th century. We detect such links by measuring how the characteristics of kin who lived outside the household affected individual well-being. For our index of well-being we use the chances of marrying and having children. Previous research has shown that for males in historical China, marriage and reproduction were sensitive indices of socioeconomic status. Privileged males married earlier and once married had more children (Harrell 1985, Lee and Campbell 1997). To analyze whether the number and socioeconomic status of different types of kin living outside the household had any effects on the chances that a male would marry or father children, we apply event-history techniques to social and demographic data from nominative, longitudinal household registers.

Sharing of resources by households in the same descent group should be apparent in a comparison of the effects of the characteristics of non-coresident and coresident kin. On the one hand, if kinship mattered more than coresidence when it came to sharing resources, the characteristics of kin outside the household should have had effects similar to those of the same kin living in the household. A rich uncle, for example, should have had the same positive effects on chances of marriage and reproduction regardless of whether or not he actually lived in the same household. On the other hand, if households were independent economic units that did not share even when their members were related, we would expect that only the characteristics of coresident kin mattered. Of course, a finding that the characteristics of non-coresident kin mattered little or not at all would imply that in at least certain respects ties between kin living in different households in historical China were not as strong as commonly assumed.

The remainder of the paper is divided into five parts. In part one, we contrast the roles of the household and descent group and outline the mechanisms by which characteristics of kin in other households may have affected the chances of marriage and reproduction. We then specify the hypotheses that we test. In part two, we introduce the household register data from rural Liaoning between 1789 and 1909 that we analyze. We explain how we use it to reconstruct networks of kin outside the household and measure their characteristics. In part three, we describe our methods. After identifying the event-history techniques we use to estimate our model, we describe the variables. We present our results in part four. After presenting some descriptive statistics on kinship networks in Liaoning, we summarize the results from the event-history analysis and assess whether or not they are consistent with our hypotheses. We conclude with a discussion of the implication of our results for our understanding of Chinese society.

1. Hypotheses

Two institutions - the household and the descent group - define rural social organization in late

imperial China. The household, which the Chinese historically called *hu*,[3] was the basic social and economic unit as well as the basic residential unit above the individual. The descent group, which the Chinese called *zu*, was the basic social and economic unit above the household.[4] Both organizations were rooted in a political economic tradition centered on kinship that dates back at least three millennia. Both organizations were reinforced by the Chinese state which consciously incorporated kinship principles in many political institutions.

The Chinese household was a highly hierarchical organization which operated on conflicting principles of equity and inequality.[5] Household members ideally shared household resources equally. At the same time, they theoretically followed an order of precedence and deference defined by the so-called Five Human Relationships (*wulun*).[6] Chinese states reinforced these general principles - patriarchy, generation, age, and gender - in their definition of personal and property rights. [7] Moreover, most dynasties granted parents absolute power over the person and property of their children, and by extension endowed household heads with similar power over household members.[8]

But, while the household was a relatively rigid hierarchical unit of production and reproduction, the descent group was a comparatively flexible unit of redistribution that resolved intra-familial disputes and allocated corporate descent group resources according to extra-familial strategies.[9] Descent groups provided individuals and families with a variety of opportunities for economic and social advancement. As a result, talented individuals were often able to rise above their

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[3] The contemporary term, of course, is *jia* or family. Generally, however, Chinese historical documents refer to the *hu* rather than the *jia*, probably because of the confusion between the biological and residential family or the nuclear and extended domestic group.

[4] See Watson 1982 and 1986 for a discussion of Chinese kinship terminology and for the common English equivalents.

[5] See the canonical proscriptive explanation of Chinese kinship in Baker 1976 and the description of the demographic consequences in Lee and Campbell 1997.

[6] These relationships were ruler-minister, father-son, elder brother-younger brother, husband-wife, and friend-friend Three of these five deal specifically with the household: father-son, elder brother-younger brother, and husband-wife. While the relationships between ruler and minister is not specifically familial, the powers of the paterfamilias were self-consciously patterned after the ruler, or vice-versa.

[7] Baker 1976 explains how each of the five human relationships represented larger groups. Thus the father-son relationship includes all parent-children relationships and by extension the relationship between senior and junior relatives. Elder brother-younger brother not only includes all relationships between siblings, but may be extended to cover the relationship between older and younger relatives of the same generation, while the husband-wife relationship represents the ideal hierarchy between the sexes.

[8] See the discussion of this process in Chu Tung-tsu 1961 and Lee and Wang 1999.

[9] See Baker 1976 and Freedman 1966 for the standard description of Chinese descent group behavior and Zheng 1992 and Forthcoming for the current Chinese understanding of Chinese descent group behavior.

immediate economic and social circumstances,[10] and entrepreneurial families were able to amass significant resources through agricultural and commercial businesses.[11] This standard model of the Chinese household as an institution of subordination and of the Chinese descent group as an institution of opportunity has defined our understanding of imperial and especially late imperial Chinese society for almost an entire century, dating back to the collapse of the imperial period in the early twentieth century.

There is a large literature on norms and customs related to descent groups and kinship in Chinese society. Sociologists focus on implications for social and economic organization. In the early part of the 20th century, Lang (1946) and others identified kinship as an obstacle to economic development because the pressure on individuals to take care of their relatives spawned nepotism, particularism, and corruption. More recently, Greenhalgh (1988, 1990), Whyte (1995), Wong (1985, 1988) and a number of others have explored the possibility that strong ties between kin, coresident and non-coresident, contributed to rapid economic growth in Greater China from the 1970s onwards. Kin are claimed to be sources of reliable employees, capital, contacts, and information. Anthropologists, of course, have written extensively on lineages, especially in south China (Freedman 1966). Historians have suggested that historical Chinese society was less open than it might otherwise appear because kin networks monopolized opportunities for advancement. Hymes (1986), for example, argued that the imperial exam system was not as open as claimed by Ho (1962) because many of the successful exam candidates he studied had distant kin who also had passed, even if their fathers and grandfathers had not. Hymes inferred that these distant kin must have contributed somehow to the success of the candidates he studied.

To detect economic links among households in the same descent group, we focus on how the number of kin outside the household and their socioeconomic status affected the chances of marrying and having children. The underlying intuition is similar to that of the analysis of income sharing between non-coresident kin in the contemporary United States by Altonji, Hayashi, and Kotlikoff (1992). If relatives in separate households maintained economic links, whether through cooperation in agricultural production or the sharing of economic and social capital, the number and socioeconomic status of kin outside the household should have affected individual outcomes. If households were largely self-contained economic units, working their land by themselves and not sharing resources, then the characteristics of kin outside the household should not have mattered.

If households shared resources, there are at two reasons to expect the number of kin outside the household to have affected the chances of marrying. First, previous results from the analysis of male first marriage indicate that its probability was correlated with the number of adult males in the household (Campbell and Lee 1999). We attributed this to the association between household size and economic status that was a widely-noted feature of rural Chinese society before the

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[10]   Ho 1962 provides specific examples of such advancement through descent group financed education.

[11]   Watson 1976 presents several examples from a contemporary emigrant Hong Kong descent group.

middle of this century (Gamble 1954). If the association stemmed from returns to scale in agricultural production, kin who lived in separate households but worked the land together should also have been able to enjoy returns to scale. Second, even if there were no returns to scale in agricultural production or no cooperation between households, more kin meant a larger base over which to spread the costs of marriage. Most explanations of early marriage in Asian societies such as China claim that whereas in northwest Europe the need for individuals to be self-sufficient kept the age at marriage high, in Asia the ability to draw upon the resources of the extended family meant that there was no such constraint (Davis 1955, Davis and Blake 1956).

There are similar reasons to expect effects of the number of kin on reproduction. If kin who lived in separate households cooperated in agricultural production and there were returns to scale, married men with more kin should have been able to father more children. More generally, the availability of resources from kin living in other households would have meant that the costs of raising a young child could have been spread over a wider base. The logic here is similar to that for the explanations of low ages at marriage in Asian societies. The more kin a couple had, the less they had to consider their own economic situation when deciding whether or not to have an additional child. We do expect, of course, that any effects will be more muted than those for marriage chances, because reproduction was subject to more chance variation.

If households in the same descent group maintained economic links, the socioeconomic status of relatives in other households should also have affected the chances of marrying and having children. Parents seeking brides for their sons could seek assistance from wealthy kin when putting together brideprice. Even if wealthy kin outside the household did not contribute directly to a brideprice, their presence should have improved the marital prospects of young men. Chinese society in the past was hypergamous, so that families with daughters sought to marry them into families of high status. In this environment, an otherwise undistinguished groom who had a prominent relative was a good catch because he could make use of that relative s connections and perhaps make claims on him. Couples who expected to be able to make claims on wealthy relatives, meanwhile, would have been less sensitive to their own economic condition when making decisions about reproduction.

To account for the possibility that apparent effects of the characteristics of non-coresident kin are the product of common endowments, not sharing of economic and social capital, we base our inferences on comparison between the effects of coresident and non-coresident kin. Where an effect is apparent for coresident but not non-coresident kin, the implication is that connections between kin in separate households are limited. Coresidence, in other words, is more important than kinship. Where an effect is apparent for both coresident and non-coresident kin, depending on the kin characteristic under consideration it may reflect the effects of either common endowments or the sharing of economic and social capital. Where no effect is apparent for either type of kin, then no relevant conclusion may be drawn. If the peculiar situation arises that an effect is apparent for non-resident but not resident kin, we have no interpretation.

To distinguish between the effects of common endowments and the sharing of economic and

social capital, we will consider the effects of two forms of socioeconomic status. In the populations covered by the register data, two types of status were recorded: possession of a salaried state position, and possession of a purchased title. The salaried positions were ostensibly awarded according to merit, and from empirical results appear to have been available to men regardless of their family background (Lee and Campbell 1997). Observed effects of having a non-coresident kin with a salaried position are most likely to be the result of sharing of income between households than a common endowment. An effect of having a kin with a purchased title, of course, is more likely to reflect the effects of a common endowment such as a patrimony that was divided at some point in the past.

Data

The household register data we use are derived from Household and Population Registers of the Eight Banner Han Chinese Army' (*Hanjun baqi rending hukou ce*). These were compiled on a triennial basis for a number of Han Chinese banner populations living on state farms in the northeast and certain other locations from the early 18th century until 1909. The Qing relied heavily on these registers for civilian and military administration of these populations. They accordingly devised a remarkable system of internal cross-checks to ensure consistency and accuracy. First, they assigned every person in the banner population to a residential household (*linghu*) and registered them on a household certificate (*menpai*). Then they organized households into clans (*zu*), and compiled annually updated clan genealogies (*zupu*). Finally, every three years they compared these genealogies and household certificates with the previous register to compile a new register. They deleted and added people who had exited or entered in the last three years and updated the ages, relationships, and occupations of those people who remained. Each register, in other words, completely superseded its predecessor.

The registers recorded at three year intervals for each person in the target population the following information in order of appearance: relationship to their household head; name(s); adult banner status; age; animal birth year; lunar birth month, birth day, and birth hour; marriage, death, or emigration, if any during the intercensal period; physical disabilities, if any and if the person is an adult male; name of their kin-group head; banner affiliation; and village of residence. Individuals were listed one to a column in order of their relationship to the head, with his children and grandchildren listed first, his coresident siblings and their descendants listed next, and then uncles, aunts, and cousins. Wives are always listed immediately after their husbands.

The banner registers provide far more comprehensive and accurate demographic and sociological data than the *baojia* household registers and lineage genealogies common elsewhere in China (Harrell 1987, Jiang 1993, Skinner 1987, Telford 1990). This is true for the entire Northeast which was the Qing homeland and was under special state jurisdiction, distinct from the provincial administration elsewhere. Regimentation of the population actually began as early as 1625, when the Manchus made Shenyang their capital and incorporated the surrounding communities into the banner system (Crossley 1997, Ding 1992, and Elliott 1997). By the late eighteenth century, not only was the population registered in remarkable precision and detail,

migration was strictly controlled, not just between Northeast China and China Proper, but between communities within Northeast China as well. Government control over the population was tighter than in almost any other part of China. Indeed, individuals who departed from the area without permission were actually identified in the registers as escapees (*taoding*). As a result, the Eight Banner household registers are the most extensive and detailed records of a rural Chinese population in the late imperial period (Lee and Campbell 1997, 223-237).

The data we analyze are a subset from a sample we have compiled from these registers that consists of almost 100,000 individuals who lived in Liaoning from the middle of the 18th century to the beginning of the 20th. As summarized in table 1, individuals lived in 12 state farm systems. We exclude two systems, Chengnei and Daxingtun, from the analysis here. Chengnei was urban, and the data for Daxingtun are still being cleaned. Additionally, because the registers do not provide household-level detail until 1789, we are unable to use observations from before that year. Because the registration of daughters was incomplete, when we examine reproduction we only consider male births. Finally, as discussed later, for methodological reasons we excluded from consideration registers where both the immediately succeeding one and the one after it were both missing.

<center>Table 1 here</center>

The registers are an exceptional source for the study of male first marriage. Because marital statuses are recorded for individuals in every register, and individuals can be linked across registers, we can infer whether or not a male has married by examining whether he has changed from being unmarried to being married or widowed between one register and the next. The major shortcoming of these data for the purposes of this analysis is that in the rare cases where a man married but his new wife died before the next register was compiled, his marital status would remain unchanged from one register to the next, and we would have no evidence of the marriage. Another shortcoming of the registers is that they do not allow married women to be traced back to their natal families; thus we do not know whether families obtained brides for their sons from within the same register population, or from other populations in the area. In other words, we can not study intermarriage.

The registers may also be used to study reproduction, but there are caveats. First, the registers do not record births per se. They record children present in the household at the time a register was compiled. Children, moreover, usually did not appear in the register immediately following their birth, but instead in the one after it. As a result, most children were first observed when they were between 3 and 6 Western years of age. If they died before they were recorded, they left no trace of their existence. Accordingly, for our analysis we constructed the variable for the number of births occurring to a father in the period between two registers by working backwards from the year of the register in which a child was first recorded and the age reported for him or her at that time.

To measure socioeconomic status we use data in the registers on Eight Banner positions and

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purchased titles held by adult males.[12] Men on the state farms were eligible to serve in the Eight Banner occupational hierarchy in any one of a number of capacities. When they did so, their position was noted. While we do not have precise data on incomes associated with these positions, we do know that pay was both in cash and in kind. Fragmentary evidence suggests that it was considerable. A soldier s income was enough to feed dozens of people, for example. Certainly, the marriage and fertility behavior of men with position was suggestive of relative prosperity: they married earlier and had more children (Lee and Campbell 1997:Chapters 8 and 9). For the purposes of analysis, we have collapsed the dozens of positions originally recorded in the registers into four basic categories. In ascending order of socioeconomic status, the four categories were soldiers, artisans, functionaries, and officials. All had incomes from the state. Officials were of especially high status because they had control over state resources that they could have parlayed into additional income opportunities. As for the purchased titles, while they may not have carried any authority, they were so expensive that they may be safely treated as an indicator of considerable wealth.

To identify kin outside the household, we first had to reconstruct male pedigrees by linking fathers to sons and then chaining these links together. Table 2 summarizes the percentages of men whose male ancestors could be traced back from one to six generations. In general, the later a man was born, the further back we could trace his ancestry. We identified fathers for almost all men. The exceptions were men who first appeared in adulthood without a living parent, either because they were in the first register in a series, or because they migrated in. We identified great-grandfathers for more than one-half of men. The majority were men who appeared from the middle of the 19th century onward. For 8.3 percent of men, mainly those born at the 19th century and the beginning of the 20th, we could trace ancestry for six generations.

Table 2 here

Once we had traced male descent lines, we identified living kin and created new variables consisting of counts of different types of relations currently alive. Of course, when selecting cases for an analysis of the effects of particular types of kin, we had to restrict ourselves to men whose ancestry could be traced back far enough to identify such kin. An analysis involving the characteristics of cousins, for example, requires men whose grandfathers could be identified. If the characteristics of second cousins are involved, analysis must be restricted to men whose great-grandfathers could be identified. To avoid restricting ourselves to the last few registers, in the analysis we limited ourselves to consideration of relationships for which it was only necessary to identify the great-grandfather of the index individual: first cousins, second cousins, father s brothers, and father s first cousins. Men who shared a grandfather but not a father were first cousins. Men who shared a great grandfather but not a grandfather were second cousins. We identified men as father s brothers, or uncles, if they were not the index male s father, but their father was his grandfather. We identified men as father s cousins if their grandfather was the

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[12] Unfortunately, these data do not provide any details on non-Banner occupations. Nor do they provide any direct measures of wealth or income.

index male s great-grandfather.

Methods

To study the determinants of first marriage and reproduction, we apply discrete-time event-history methods. For the study of first marriage timing, we estimate a conditional log-log regression. For event-history analysis, it is more appropriate than logistic regression. The estimated coefficients are directly comparable to those from continuous-time event-history methods. The dependent variable in the analysis is a dichotomous indicator of whether or not a man marries for the first time by the next available register. We restrict the analysis to men who have not yet married. For the study of reproduction, we use Poisson regression. The dependent variable is a count of the number of males recorded as born to the index individual by the next available register. We restrict to observations of currently married men. In both cases, we only use observations where either the immediately succeeding register or the one after it is available.

We summarize the explanatory variables in table 3. Some are controls that we included to reduce the chances that results for variables of substantive interest would be contaminated by compositional differences. Thus we controlled for age with a sixth-degree polynomial in which the second and higher order terms were orthogonalized. To account for the effects of presence of parents apparent in previous analyses, we include indicator variables for whether or not father and mother are alive. In the analysis of marriage timing, to account for sequencing behavior, in which brothers and even cousins in the same household married in order of seniority, we also include indicators for whether or not there are never-married elder brothers or cousins present. In the analysis of fertility, to ensure that we are comparing men at similar stages of their reproductive careers, we include variables for the presence of living sons.

Table 3 here

To measure links between kin living in separate households, as discussed earlier we compare the effects of kin characteristics by coresidence. Because we expect links between close kin to have been stronger than links between distant kin, we hold relationship constant by making comparisons within five categories: brothers, cousins, second cousins, uncles, and father s cousins. As will be seen later, some of these relationships turned out not to be amenable to comparison because too few of the specified kin lived outside the household. We include variables to measure three characteristics of each category of kin: numbers, positions held, and purchased titles.

To measure the effects of numbers of each type of kin, we use count variables. For the index individual, we tabulate living brothers, first cousins, second cousins, uncles, and father s cousins according to whether or not they lived in the same household. The coefficients for these count variables represent the effect of adding a relative with the specified relationship, holding everything else equal, including the number of kin in the remaining categories. To measure the effects of kin holding purchased titles, we also make use of count variables. They are constructed

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by tallying the numbers of kin in each category who hold a purchased title.

To measure the effect of positions held by kin of each type, we constructed indices of socioeconomic status. In the absence of auxiliary data on the income associated with each position, we have to make use of the data in the registers. We first regrouped the dozens of positions recorded in the population registers into the four basic categories described earlier: soldier, artisan, functionary and official. We then estimated models that related the chances of marrying or having children to the possession of these positions by the index individual or his father. Table 4 presents the results. We treated the coefficient for each category of position as a score to be used in the analysis. To calculate the socioeconomic index for each type of relation, we summed across the four categories of position the products of the scores and the number of kin with a position in the corresponding category. For example, in the analysis of first marriage, if a man lived with a second cousin who was an artisan and two second cousins who were soldiers, the index for the positions held by his coresident second cousins would be 1*0.484+2*0.216=0.916.

Table 4 here

As a result, the coefficient estimated for an index compares the effect of possession of a position by a kin of the specified relationship with the effect of possession of the same position by one s father or oneself. A coefficient of 0 means that the possession of a position by a kin of the specified type has no effect on the chances of the event of interest. A coefficient of 1 means that it has the same effect as possession of the same position by oneself or one s father. Coefficients between 0 and 1, if statistically significant, reveal that there is an effect when the specified kin holds a position, but it is not as strong as if the position was held by onself or one s father.

Results

We begin the presentation of results by describing networks of male paternal kin at each stage of the life cycle. We focus on brothers, first and second cousins, and father s brothers and first cousins, distinguishing them according to whether or not they reside in the same household. Table 5 summarizes the percentages of men in each of four age groups who have male kin of each type, along with the mean numbers of each type of kin. Since we are also interested in the proportions of men with privileged relatives who might be able to provide assistance, table 6 summarizes the percentages of men at each stage of the life cycle who have kin who hold positions in the banner position or have purchased titles.

Most men had at least one living brother, at least before they reached old age. If a man had living brothers, moreover, he almost always lived with them Thus according to table 5, between 42 and 62 percent of men had a living brother, but less than 2 percent had one who resided in another household. The implication is that during the period covered by these data, the last half of the 19th century and the beginning of the 20th, single-family households in these populations were the product of mortality or low fertility, not the division of households between brothers.

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Table 5 here

Men were not only more likely to have a cousin than a brother, they were also more likely to have one who lived in another household. According to table 4, two-thirds of men had a living first or second cousin. The chances that these cousins would live in another household depended on the distance of their relationship. Men were more likely to have a first cousin living with them than one living in another household. Reflecting the tendency of households to divide when they became highly complex, however, second cousins tended to live in other households. Indeed, from early adulthood on, men were more likely to have a second cousin outside the household than within it. By old age, only 5.7 percent of men resided with a second cousin, but 35.6 percent had one who lived in another household.

The results for uncles and father s cousins are in line with those for brothers and cousins. More than three-quarters of male children had a living uncle or father s cousin, as did two-thirds of young adult males. Whether or not these senior kin resided in the same household depended on their relationship distance. Because brothers lived together even after they married and had children, even though large proportions of male children and young adult males had living uncles, small proportions had an uncle who lived in another household. Between one-fifth and one-quarter of male children and adults, however, had a father s cousin who lived in another household.

While only a small proportion of men held a position or purchased title at any given time, a substantial number were related to someone who did. For example, according to table 6, even though only 1.4 percent of young adult males held a position, 11.5 percent lived in a household with someone who did, and 14.9 percent were related to someone with a position. Similarly, even though only 3.9 percent of older adult males held a position, 11.0 percent lived with someone who did, and a total of 16.0 percent were related to someone who held one. Similarly, even though only 0.3 percent of young adult males held purchased titles, 1.9 percent lived with someone who held one, and a total of 2.4 percent had a relative who held one.

Table 6 here

Many privileged kin to whom might at least in theory look for support were distant relatives, not fathers or brothers. 4.5 percent of young adult males had first or second cousins who held a position, as did 6.7 percent of older adult males. Whether or not such kin resided in the same household depended on their distance. First cousins were likely to live in the same household, but second cousins tended to live in other households. Similarly, 8.0 percent of young adult males had uncles or father s first cousins who held a position, as did 5.7 percent of older adult males. Again, whether or not such kin resided in the same household depended on how distantly they were related. Uncles with positions tended to be in the same household, while father s cousins were more likely to live outside the household.

These descriptive results imply constraints on the relations for which we can make comparisons in

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the event-history analyses. We can only compare the effects of kin of a particular type according to whether or not they are coresident in situations where they are present in sufficient numbers both within and without the household. According to table 6, there are too few brothers who live outside the household to compare their effects with those of coresident brothers. There are also too few uncles and first cousins with purchased titles who live outside the household to compare their effects. Finally, there are too few non-coresident first cousins to examine their effects.

Marriage chances clearly depended on which immediate kin were present in the household. According to the results of event-history analysis in table 7, men were more likely to marry if one or both of their parents were alive. This is in line with previous findings from these populations, and are consistent with expectations. Marriages in historical China were arranged by parents. They dealt with matchmakers, evaluated information about prospective spouses, and negotiated with the prospective spouse s family. A man missing one or both parent was accordingly at a substantial disadvantage. Men, meanwhile, were much less likely to marry if an older never-married brother or cousin lived in the household. Parents acquiring brides for their sons in historical China, of course, followed a seniority rule. Brothers and apparently even cousins who lived in the same household married in order of age.

Table 7 here

The presence or absence of immediate kin also affected fertility chances. In line with previous findings, the presence of parents raised the chances of having a child. Parents, of course, may have pressured adult children to reproduce and carry on the family line. Their presence may also have lowered the perceived costs of children for couples because of the possibility that they could help with care. Reflecting couples tendency to practice stopping behavior once they had a desired number of male children, fathers who had one or more living sons were less likely to have another.

Own and father s socioeconomic status also had strong effects on the chances of marriage and reproduction. As demonstrated earlier in table 4, holding a position, or being the son of someone who held one, raised the chances of marriage for never-married men and of having a son for currently married men. Possession of a purchased title by father and especially self raised the chances of marriage, but not of reproduction. These results are in line with previous findings, and the reasons for them are intuitive. Men who held positions or purchased titles not only had the financial wherewithal to put together a brideprice, they also would have been considered good catches by families seeking to marry off their daughters. They had prestige, money, and connections.

The chances of marrying and reproducing also depended on the socioeconomic status of coresident senior relatives. The presence of an uncle in the household who held a position raised the chances of marriage. Senior males in the family, of course, did not share all the proceeds of their position with their nephews. According to the coefficient for uncles the effect of their position was only half as strong as that of own or father s. A position held by a father s cousin

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had as strong a positive effect on reproduction as one held by oneself or one s father. Coresidence with a father s cousin who held a purchased title, meanwhile, raised marriage chances substantially. Indeed, the effect was almost as strong as that of the possession of a purchased title by one s father.

Though men with positions or purchased titles helped out their sons and nephews, they did little for their brothers and cousins. There is no evidence in table 7 that living with a brother, first cousin, or second cousin who held a position or purchased title raised the chances that a man would marry or have children. Either prosperous males did not contribute to the brideprice that male members of the same generation needed when they married, or families with daughters did not consider men whose brothers or cousins were prominent a good catch.

The number of men in the same generation who lived in the household, however, was positively associated with the chances of marrying. Indeed, the effects of adding a brother or first cousin were similar. Adding a second cousin to the household also improved marriage chances, but not by as much. Previously, we have interpreted the positive effects on marriage chances of the presence of brothers and cousins as evidence that there were returns to scale in agricultural production (Campbell and Lee 1999). Similarities in the effects of additional brothers and cousins, moreover, lend support to this idea. Such a pattern would be expected in a situation where household members worked land together and it was hard to divide the results on any basis but equal shares. While it remains possible that explanations of low age at marriage in Asian societies that invoke the availability of resources from the extended family are correct (Davis 1955, Davis and Blake 1956), the lack of an effect for brothers and cousins socioeconomic status seems to contradict this.

Even though the characteristics of coresident kin had powerful effects on the chances of marriage, and some effects on the chances of reproducing, the characteristics of non-coresident kin had almost no discernible effects on either. In the two cases where the position or purchased title held by a coresident relative affected marriage chances, possession of a similar status by someone of the same relationship who lived outside the household had no effects at all. Similarly, even though possession of a purchased title by a coresident father s cousin raised the chances of having a son dramatically, the possession of a title by a father s cousin who lived in another household had no effect at all. The rewards of high socioeconomic status, in other words, were not shared with kin unless they lived in the same household.

An identical pattern appears when we consider effects of number of kin. While the numbers of brothers, first cousins, and second cousins who lived in the household all had a positive association with the chances of marriage, the numbers of first and second cousins who lived outside the household had no association whatsoever. If the benefits of coresidence with brothers, first cousins, and second cousins derived from returns to scale in household production, the implication is that kin living in separate households did not collaborate at production, and therefore did not enjoy such returns. If the benefits of coresidence derived from the possibilities for spreading the costs of marriage, the implication is that kin who did not coreside did not share

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costs. Either way, it appears that households were relatively self-contained.

Conclusions

Within the household, patterns of resource sharing were complex. Clearly, as claimed earlier in Campbell and Lee (1999), household allocations were not altruistic in the sense of Becker (1981). Households did not pool the incomes generated by members and then redistribute it without regard to who had originally contributed what. In such a situation, the effects of father s characteristics would have been the same as those of uncle s characteristics, and the characteristics of brothers and cousins would have had the same effects as own characteristics. Instead, it appears that whether or not transfers occurred within the household depended on relationships. Men could count on some assistance from prosperous coresident uncles when it came to securing the resources necessary to marry and have children, but it was generally not as much help as they could expect from prosperous parents. As for privileged brothers and cousins, men could not expect anything at all from them.

Even though the strength of ties between kin is treated as axiomatic in discussions of both historical and contemporary Chinese society, we find no evidence that kin who lived in separate households shared resources, at least not in such a fashion that it affected the chances of marrying or reproducing. While there is clear evidence that the characteristics of kin who lived in the same household affected outcomes, it is also clear that when the same kin lived in other households, their characteristics had no effects. When it came to the resources necessary to marry or have children, it appears that men relied on the kin they lived with, not on kin who lived in other households. This is not to say that ties between non-coresident kin in rural Liaoning were unimportant, only that the scope of interactions was perhaps more limited than is usually assumed to have been the case in Chinese society.

The possibility remains that individuals made use of connections to kin outside the household in extreme or unusual situations, even if they didn t share resources on a day-to-day basis. In this analysis we have not ruled out the possibility that resources available from networks of kin outside the household helped to soften the impact of economic fluctuations. In future studies we will address this possibility by examining how the characteristics of kin networks conditioned demographic responses to changing economic conditions. In this analysis, we have also failed to rule out the possibility that prominent kin living in other households were a means of social advancement, as Hymes (1986) suggested in his study of exam candidates from Fuzhou. Again, in a future study we will address this possibility by examining how the characteristics of non-coresident kin affected the chances of attaining positions in the Eight Banner system.

Such results call more emphasis in analyses of kinship in China and perhaps other Asian societies on measurement of the implications of kin ties. It may be that the importance of economic and other ties between non-coresident kin are too much for granted. Careful examinations are in order, whether quantitative or qualitative, of economic interactions between kin. Greater attention should be paid to identifying the precise circumstances under which kin cooperate or share

resources with each other. In other words, more micro-level analysis along the lines of Bian (1997) and Yan (1996) is needed of the implications for individuals of participation in kin and other social networks.

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Table 1. Available Data

Dataset	Observations	Distinct Individuals
North		
Bakeshu	40279	7572
Dadianzi	27535	6561
Dami	25378	4226
Feicheng Yimiancheng	66569	9482
Central		
Chengnei	29578	5779
Daoyi	114272	16304
Daxingtun	26677	7915
Guosantun	35073	5053
South		
Gaizhou Manhan	45043	12577
Gaizhou Mianding	22558	4250
Gaizhou Rending	41248	7328
Niuzhuang Liuerbao	50256	9483
Total	524466	96530

Table 2. Percentages of men whose ancestry could be traced between 1 and 6 generations

Generations	Percent
1	88.0
2	72.3
3	52.3
4	34.4
5	18.9
6	8.3
N	41263

Table 3. Means and standard deviations of the variables used in the analysis

	Male first marriage		Male births	
	(Never-married men 6-45 *sui*)		(Married men 6-50 *sui*)	
	Mean	S.D.	Mean	S.D.
Marriage by next register	0.16		0.203	0.441
Boys by next register				
Age	15.67	8.41	31.39	9.39
Father alive	0.79		0.52	
Mother alive	0.80		0.58	
1-2 Sons alive			0.42	
2+ Sons alive			0.04	
Never-married older brother coresident	0.22			
Never-married older cousin coresident	0.25			
Positions				
Own and father s	0.014	0.071	0.009	0.040
Coresident uncles	0.013	0.073	0.005	0.031
Other uncles	0.001	0.019	0.000	0.007
Coresident father s first cousins	0.009	0.063	0.002	0.023
Other father s first cousins	0.009	0.064	0.004	0.029
Coresident brothers	0.002	0.029	0.005	0.031
Coresident first cousins	0.003	0.037	0.004	0.031
Coresident second cousins	0.002	0.028	0.001	0.011
Other second cousins	0.005	0.043	0.004	0.027
Purchased title				
Own	0.001		0.005	
Father	0.004		0.005	
Coresident uncles	0.004		0.004	
Coresident father s first cousins	0.005		0.007	
Other father s first cousins	0.003		0.005	
Coresident brothers	0.001		0.004	
Coresident first cousins	0.002		0.003	
Coresident second cousins	0.002		0.001	
Other second cousins	0.001		0.005	
Numbers of kin				
Coresident brothers	0.921	1.071	1.050	1.125

Coresident first cousins	0.928	1.522	1.085	1.685
Other first cousins	0.109	0.528	0.221	0.793
Coresident second cousins	0.648	1.753	0.564	1.710
Other second cousins	0.726	1.930	1.274	2.707
Coresident uncles	0.833	1.017	0.548	0.894
Other uncles	0.056	0.307	0.082	0.388
Coresident father s cousins	0.728	1.499	0.424	1.173
Other father s cousins	0.466	1.156	0.560	1.266
Next register 6 years away	0.170			
Region (Reference: North)	0.32		0.35	
Central	0.41		0.38	
South	0.28		0.26	
N	38017		28303	

Table 4. Own and father s position and the chances of first marriage and reproduction, 1789-1909

	Male first marriage		Male births	
	(Complementary log-log, never-married men 6-45 *sui*)		(Poisson, married men 6-50 *sui*)	
	Coefficient	p-value	Coefficient	p-value
Age	$6.48*10^{-2}$	0.00	$-3.21*10^{-2}$	0.00
Age^2	$-8.20*10^{-3}$	0.00	$-1.87*10^{-3}$	0.00
Age^3	$3.96*10^{-4}$	0.00	$-1.52*10^{-5}$	0.37
Age^4	$-4.79*10^{-6}$	0.01	$-2.74*10^{-6}$	0.07
Age^5	$-2.76*10^{-7}$	0.11	$2.27*10^{-7}$	0.09
Own or father s position (Reference: Adult male)				
Soldier	0.216	0.01	0.146	0.02
Artisan	0.484	0.00	0.202	0.09
Functionary	0.171	0.33	0.106	0.45
Official	0.495	0.00	0.020	0.80
Region (Reference: North)				
Central	-0.173	0.03	0.394	0.00
South	-0.008	0.92	0.323	0.00
Year	0.005	0.00	0.004	0.00
Year * Central	-0.002	0.12	-0.006	0.00
Year * South	-0.001	0.56	-0.006	0.00
Next register 6 years away	0.854	0.00		
Constant	-3.443	0.00	-2.154	0.00
N	38017		28303	

Notes: Second and higher order age terms were orthogonalized. Year was year minus 1792. We restricted analysis to observations 1) of men whose great-grandfathers could be identified, 2) in registers for which the immediately succeeding register or the one after it was also available. In the poisson regression, the exposure measure was number of years until next register.

Table 5. Paternal kin of males in Liaoning, 1789-1909

		Age range							
		1-15 *sui*		16-35 *sui*		36-55 *sui*		56-75 *sui*	
		Mean	% > 0	Mean	% > 0	Mean	% > 0	Mean	% > 0
Brothers	Coresident	0.83	51.0	1.09	61.8	0.91	55.1	0.61	41.3
	Non-coresident	0.00	0.3	0.01	0.7	0.02	1.5	0.02	1.5
	Either	0.83	51.1	1.10	62.2	0.92	56.1	0.63	42.5
First cousins	Coresident	0.93	39.9	1.12	44.3	0.87	35.4	0.47	23.8
	Non-coresident	0.08	4.2	0.17	8.3	0.31	14.8	0.37	18.6
	Either	1.01	42.8	1.29	49.9	1.18	46.8	0.84	39.0
Second cousins	Coresident	0.74	24.9	0.65	20.4	0.34	11.6	0.13	5.7
	Non-coresident	0.56	16.1	1.06	27.5	1.41	36.5	1.23	35.6
	Either	1.31	37.5	1.70	43.8	1.75	44.3	1.36	39.1
First or second cousins	Coresident	1.67	52.8	1.77	53.8	1.21	41.6	0.61	27.5
	Non-coresident	0.64	18.8	1.22	32.4	1.72	45.0	1.60	46.4
	Total	2.32	61.5	2.99	69.2	2.93	68.0	2.21	60.0
Uncles	Coresident	0.96	55.4	0.68	42.9	0.30	21.1	0.10	7.5
	Non-coresident	0.05	3.8	0.08	5.3	0.08	5.6	0.04	2.9
	Total	1.02	58.4	0.76	47.2	0.38	26.1	0.14	10.1
Father s first cousins	Coresident	0.96	36.9	0.53	22.7	0.19	9.6	0.06	3.5
	Non-coresident	0.42	18.4	0.53	23.8	0.47	22.4	0.25	20.9
	Total	1.38	50.9	1.06	42.9	0.66	29.8	0.31	16.3
Father s brothers or first cousins	Coresident	1.92	68.8	1.22	53.1	0.49	27.1	0.16	10.0
	Non-coresident	0.48	20.5	0.61	27.0	0.55	25.9	0.29	15.6
	Total	2.40	77.6	1.82	67.6	1.04	45.7	0.45	23.3
N		43745		44040		22648		6952	

Table 6. Percent of male kin with banner positions or purchased titles, 1789-1909

		Age range							
		1-15 *sui*		16-35 *sui*		36-55 *sui*		56-75 *sui*	
		Position	Title	Position	Title	Position	Title	Position	Title
Self		0.0	0.0	1.4	0.3	3.9	0.6	5.0	0.3
Father		4.8	0.6	4.7	0.5	2.4	0.2	0.4	0.0
Brothers	Coresident	0.4	0.1	1.7	0.3	3.1	0.4	3.3	0.2
	Non-coresident	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
	Either	0.4	0.1	1.7	0.3	3.2	0.4	3.4	0.2
First cousins	Coresident	0.8	0.2	1.8	0.3	2.3	0.3	1.2	0.2
	Non-coresident	0.0	0.0	0.2	0.0	0.8	0.2	1.6	0.4
	Either	0.8	0.2	2.0	0.4	3.1	0.6	2.7	0.6
Second cousins	Coresident	0.5	0.1	0.5	0.3	0.3	0.6	0.2	0.6
	Non-coresident	0.8	0.1	2.2	0.2	3.7	0.1	2.6	0.1
	Either	1.3	0.2	2.6	0.5	4.1	0.7	2.8	0.6
First or second cousins	Coresident	1.3	0.3	2.2	0.5	2.6	0.4	1.3	0.3
	Non-coresident	0.8	0.1	2.4	0.3	4.4	0.7	4.0	0.9
	Total	2.1	0.4	4.5	0.8	6.7	1.1	5.3	1.2
Uncles	Coresident	2.0	0.5	2.6	0.5	1.8	0.2	1.1	0.1
	Non-coresident	0.3	0.0	0.4	0.0	0.4	0.0	0.1	0.1
	Total	3.9	0.5	4.2	0.5	2.5	0.3	0.7	0.2
Father's first cousins	Coresident	2.6	0.5	2.0	0.4	0.8	0.2	0.3	0.1
	Non-coresident	1.7	0.3	2.7	0.4	2.8	0.4	1.3	0.3
	Total	4.2	0.8	4.7	0.8	3.6	0.5	1.6	0.4
Father's brothers or first cousins	Coresident	5.7	0.9	5.4	0.8	2.8	0.4	0.8	0.2
	Non-coresident	1.9	0.3	3.0	0.4	3.1	0.4	1.4	0.4
	Total	7.4	1.2	8.0	1.1	5.7	0.7	2.2	0.5
Any kin (including self)	Coresident	9.9	1.8	11.5	1.9	11.0	1.6	8.6	0.8
	Non-coresident	2.4	0.3	4.7	0.6	6.7	1.0	5.2	1.1
	Total	11.7	2.0	14.9	2.4	16.0	2.4	13.8	1.9
N		43745		44040		22648		6952	

Table 7. Kinship networks and the chances of first marriage and reproduction, 1789-1909

	Male first marriage		Male births	
	(Complementary log-log, never-married men 6-45 *sui*)		(Poisson, married men 6-50 *sui*)	
	Coefficient	p-value	Coefficient	p-value
Age	$5.92*10^{-2}$	0.00	$-0.025*10^{-2}$	0.00
Age^2	$-7.74*10^{-3}$	0.00	$-1.875*10^{-3}$	0.00
Age^3	$3.88*10^{-4}$	0.00	$2.140*10^{-5}$	0.21
Age^4	$-5.22*10^{-6}$	0.00	$-2.460*10^{-6}$	0.10
Age^5	$-2.61*10^{-7}$	0.13	$2.260*10^{-7}$	0.09
Father alive	0.071	0.03	0.055	0.06
Mother alive	0.160	0.00	0.059	0.04
1-2 Sons alive			-0.218	0.00
2+ Sons alive			-0.154	0.06
Never-married older brother coresident	-0.741	0.00		
Never-married older cousin coresident	-0.303	0.00		
Positions				
Own and father s	0.775	0.00	0.729	0.03
Coresident uncles	0.472	0.01	0.595	0.13
Other uncles	-0.015	0.98	0.435	0.81
Coresident father s first cousins	0.288	0.16	1.046	0.05
Other father s first cousins	-0.253	0.26	0.572	0.21
Coresident brothers	-0.185	0.66	0.312	0.50
Coresident first cousins	0.090	0.79	0.670	0.11
Coresident second cousins	-0.383	0.44	0.169	0.86
Other second cousins	-0.133	0.66	0.416	0.42
Purchased title				
Own	0.832	0.01	0.137	0.46
Father	0.425	0.02	-0.177	0.36
Coresident uncles	-0.132	0.48	0.013	0.94
Coresident father s first cousins	0.407	0.00	-0.001	0.99
Other father s first cousins	0.151	0.48	-0.324	0.09
Coresident brothers	0.292	0.49	-0.182	0.41
Coresident first cousins	-0.206	0.51	-0.070	0.76
Coresident second cousins	0.004	0.99	0.050	0.87

Other second cousins	0.114	0.67	0.027	0.88
Numbers of kin				
Coresident brothers	0.098	0.00	0.010	0.39
Coresident first cousins	0.077	0.00	-0.003	0.80
Other first cousins	0.007	0.79	0.002	0.94
Coresident second cousins	0.033	0.00	0.014	0.18
Other second cousins	-0.006	0.50	-0.001	0.90
Coresident uncles	-0.067	0.00	0.020	0.28
Other uncles	0.137	0.00	0.010	0.83
Coresident father s cousins	-0.013	0.29	0.004	0.80
Other father s cousins	0.011	0.45	0.025	0.08
Next register 6 years away	0.860	0.00		
Region (Reference: North)				
Central	-0.160	0.04	0.387	0.00
South	0.013	0.88	0.316	0.00
Year	0.005	0.00	0.005	0.00
Year * Central	-0.002	0.09	-0.007	0.00
Year * South	-0.001	0.24	-0.007	0.00
Constant	-3.486	0.00	-2.441	0.00
N	38017		28303	

See notes to table 4.