Cross-Status Marriage Patterns in Late 17th Century Korea: Statistical Analysis of the Tansŏng Household Registers for 1678

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Abstract

This paper presents preliminary results of statistical analysis of the Tansŏng County household registers for 1678. We focus on identifying the social class of county residents and on identifying marriages. We use a multivariate LOGIT model to estimate probabilities of marriage, both within and outside of one's social class as functions of age.

We find the overwhelming number of both males and females were monogamous; less than one percent of males taking secondary wives or "concubines". We also find strong tendencies to marry within social status groups. Despite this there is significant intermarriage between social classes. This is primarily between commoners and non-resident slaves. Also males of the elite and petty elite classes, particularly older ones, marry commoners and slaves in significant numbers.

We document significant differences in the marriage patterns for craftsmen, as opposed to other commoners.

We find strong influences of father and mother's status on marriage patterns, with higher status parents increasing the probability of marrying higher status spouses, all else equal.

Finally, we find evidence of strong village-level effects on marriage patterns which cannot be explained by the observed characteristics of the people living in those villages.

1. Introduction

The Confucian government of Korea during the Chosŏn dynasty (1392-1910) took a regular survey of its population every three years.[1] These years were known as *shingnyon* (式年), and other major events such as the highest level civil examinations were also scheduled for these years. The major purpose seems not to have been to gain an entirely accurate count of all people living in the country, but rather to document the existence and location of the large class of farmers and workers referred to as *yangin* (良人) in Korean, and often translated as "commoners". The census was the basis for various types of taxation and for conscript or corveé labor. This burden fell most heavily on commoners between the ages of 16 and 60, and coverage outside these ages and for other social classes is arguably less complete.[2] It is unclear exactly how the data recorded in the census were gathered. The structure suggests that each household's record was compared with the previous census and necessary corrections for births, deaths, moves, etc. were added. At least three copies of each household's record were made. The first, on a single sheet of paper, was kept by the household itself as evidence of having complied with the census. Copies of these household records were then complied into a large register organized by geographic units and a copy of this was sent to the capital, while another was retained at the local county office.

Few of these census registers have survived to the present day. The Japanese invasion of 1592 resulted in the destruction of most of those from the early part of the dynasty. Many others were destroyed during social unrest near the end of the dynasty and during the Korean War. Some household copies have survived, usually in the possession of the descendants of the families who were surveyed. However, there is no consistent coverage provided by these documents. Of the official copies compiled by county clerks, some fragments survive, including some neighborhoods of Seoul. Only three full sets of county registers are known today. These include registers from Taegu, Ulsan, and Tansŏng. The Tansŏng registers are the source of data for this paper.

Tansŏng registers survive for the thirteen census years listed in table 1. As can be seen they cover a period of 111 years between 1678 and 1789. There are seven cases of consecutive (i.e. only three years apart) censuses and the coverage is more complete at the end of the period.

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[1] This survey is sometimes called a census, but if so it was not nearly as thorough as modern censuses

[2] The are two forces at work here. Firstly, officials undoubtedly tried harder to get complete coverage for males, commoners and people of prime ages. On the other hand, these people also tried harder to avoid the census. It's not clear which effect is stronger in our sample.

The census is of the whole county[3] and was complied under the direction of the county magistrate who was appointed by the central government in Seoul. The county was further divided into eight administrative districts called *myŏn* (面) or townships. Table 2 lists the names of these eight townships. These were further divided into villages[4], and villages into *t'ong* (統) which were collections of five households, called *ho* (戶). The county clerks responsible for recording the census appended a summary to the end which lists number of households and the population by sex and occupation. This included information from the previous census and notes on the changes since then. These aggregate numbers are reported in table 3. The total population covered starts off at a low of 1113 households and 8321 individuals in 1678 and ends with a high of 3012 households and 13,839 individuals in 1789.

The primary unit of the census is the household. The register lists the head of each household first and then lists other members and their relation to this head. The relations are primarily familial; son, daughter, daughter-in-law, etc.; with the major exception being slaves. For each individual the following information is listed: relation to head of household, social status and/or occupation, name, age, birth year, ancestral home, information on the individual's master if a slave, information on names and status/occupation of ancestors[5], and a residence status including a "runaway" designation for many of the slaves listed.

Our focus in this paper is on marriage patterns, particularly across social status groups. The traditional description of Korean society during this time describes three major social status groups, though many scholars now recognize a small but distinct group between the ruling elite and commoners.[6]

At the top were the ruling elite, which we refer to by their Korean designation of *yangban*[7]. Yangban were the undisputed ruling class and membership was strictly hereditary. All major government positions were filled by yangban. Unlike China where the government exam system was open to all social classes, only yangban were

[3] *hyŏn* (縣), in Korean.
[4] Each is given two designations: *ch'on* (村), which appears to list the traditional name of the village or hamlet; and *ri* (里), which is associated with an administrative number.
[5] Ideally, this was the "four ancestors": father, grandfather, great grandfather, and maternal grandfather. However, for slaves coverage is sparse. Some have only one generation and list mother in place of maternal grandfather, some have only the mother listed, and other have no parents listed at all..
[6] Since there is no widely accepted name for this class, we use the term "petty elite".
[7] literally, "two sides" (兩班), referring to the civil and military branches of the government.

allowed to sit for the civil and military exams in Korea. Yangban were the primary land-owners and owned most of the slaves. Yangban accounted for a little over eight percent of the reported male population in 1678.

Between the yangban and the bulk of the population was a smaller group. These wereo local functionaries known as hyangni (鄕吏), descendants of yangban by secondary wives sŏja (庶子) and persons who performed in skilled technical tasks for the government, such as translators, legal clerks & doctors. Though they were not accepted as members of the ruling elite, they were not manual laborers either. They often imitated the trappings of the ruling elite; compiling clan genealogies and conducting ancestral rites, for example. For this reason we adopt the term "petty elite" when referring to this class. This group accounts for just under four percent of the male population.

Below this were commoners who worked as farmers, craftsmen, soldiers and petty functionaries in government offices. Commoners were free, but legally tied to a specific location. They were allowed to own land and slaves, though few actually did. Thirty-two percent of males are commoners.

Below commoners were the "lowborn", which included slaves and people in certain hereditary occupations such as butchers and leatherworkers. Slaves fell into two types: "resident" slaves[8] who lived as part of their master's household, and non-resident slaves[9] who lived separately from their masters (in many cases quite distant) and who paid a portion of their income or harvest to their owner. Slave account for fifty-six percent of males.

Intermarriage between status groups was legally prohibited, though the existence of laws detailing the status of children from such marriages obviously indicates the prohibition was not completely effective. Yangban also practiced a form of marriage that is often translated as "concubinage", where men married a secondary wife of commoner or even slave status. We find only 25 such unions and restrict our attention to primary marriages, where the woman is listed as ch'ŏ (妻), meaning wife.

Intermarriage between commoners and slaves was more widespread and is one of the primary focuses of this paper.

SUMMARY OF PREVIOUS LITERATURE HERE

Sommerville, Yi etc.

[8] *solgŏnobi* (率居奴婢)
[9] *oegŏnobi* (外居奴婢)

The remainder of this paper is organized as follows: In section 2 we discuss our data, determination of social class and marriage, and patterns observable using simple statistics such as averages and cross tabulations. In section 3 we discuss a more sophisticated statistical methodology which allows us to formally test hypotheses about marriage relations. For example we can test if the marriage patterns of slaves differ significantly from those of commoners. We present results from this estimation and draw inferences about the effects of own class, parental class, and the class of other ancestors on probabilities of marriage within and across social class. Section 4 concludes with a summary of our findings and suggestions for further research.

2. Data Set

The Tansŏng household registers were recorded in black ink on mulberry paper and the original copies "discovered" in the 1970's are now housed at Kyŏngsang National University in Chinju, not far from modern Tansŏng. Photocopies in black and white were made by the Academy of Korean Studies[10] and published in 1980. The language of the originals is classical Chinese, with Korean peculiarities. Figure 1 shows a copy of a typical page.

Researchers at Sunggyunkwan University in Seoul have been working to encode the census in computer readable format. Their data are organized in spreadsheet files by individual and are recorded using Korean phonetic characters, rather than Chinese ideographs. Entries corresponding to Figure 1 are shown in Figure 2.

We compiled the data from these files for 1678 into a relational database and then did two sets of additional classification. First, we attempted to identify the social class of each individual. Second, we identified marriages, including concubinage and polygynist marriages.

2.1 Determination of Status

Determination of class is straightforward for the bulk of the entries, but there are a sizable number of entries that present challenges. We use the following criteria to assign status.

[10] *Han'guk Chŏngshinmunhwa Yŏn'guwŏn* (韓國精神文化硏究院)

First, if an individual has a master listed, we assign slave status. For non-resident slaves the master's name, social status and location are explicitly listed. For resident slaves, the relation to head of household is given as either *no* (奴) for males or *pi* (婢) for females.

Second, for many women of commoner, petty elite and yangban status it is often the case that no given name is recorded. Instead the surname is given along with a title; rather like writing "Lady Kim" or "Mrs. Lee" in English. The titles distinguished class: *ssi* (氏) was reserved for yangban or petty elite, while *sosa* (召史) was used for commoners.[11] It is often difficult to determine the status of women based solely on title. The *ssi* title, for example seems to have been used by all yangban women, but also by some women who clearly fit into the petty elite category. The bulk of women designated as sosa are commoners, but many of these are also members of the petty elite. A detailed examination of how these titles were applied would be a worthwhile project, but is outside the scope of this paper. Hence, we categorize women into five groups: *ssi*, *sosa*, commoner, slave & other.

Third, the most common method of assigning status for males is given by their status/title designation. For yangban this often includes a government rank or position. Yangban without government rank are often listed as *yuhak* (幼學) – literally "juvenile scholar", a generic title that implied studying for the civil exams. Commoners are occasionally listed by the generic title *yangin*, but usually their occupation is given instead. Commoner occupations include: soldiers, provisioners[12], artisans and various kinds of low-level government workers. In many cases slaves also engaged in these same occupations, however, and it is possible to misidentify status. Fortunately, for most non-resident slaves the title of *no* or *pi* is listed along with the occupation.

Fourth, the status of family members is often not explicitly listed in the census. This is particularly true of children who are too young to have any formal occupation. In these cases status was deduced from parentage. For most children, both parents are of the same social class making status easy to identify. In some cases, however, only one parent is listed or parents are of different classes. In these cases, if we can establish the class of a sibling based on one of the above three criteria, then we assign the same class to the individual in question. The ancestry of individuals recorded in the census often helps in establishing class as well.

[11] Two women were listed with the distinction *sŏng* (姓) and it is clear from their ancestry they are members of the petty elite.

[12] These are people charged with providing material support for others, usually soldiers, but occasionally for government functionaries, or even government sponsored artisans.

Finally, in some cases it is possible to resolve status based on a name. Generally (but not universally) slaves did not have surnames and their given names were often very distinctive. For example "horse manure" was not an uncommon name for male slaves. Such a name would never have been used by a male of commoner status, however. Commoners usually have surnames as well and yangban always have a surname listed.

We categorize each male into one of ten classes: yangban, petty elite, craftsmen, soldiers, provisioners, *yŏngni*[13], miscellaneous commoners, resident slaves, non-resident slaves and other. The "other" category includes people with unclear or unknown status as well as monks and hermits.

These classifications along with the recorded sex of the individual allow us to look at some basic demographics. The findings discussed below apply only to residents of the county in 1678. We have excluded runaways and move-outs, along with people who had died since the 1675 census.

Table 4 shows the count of individuals by social status group and sex. The recorded resident population is almost exactly half male (4147) and half female (4149). However, the relative number of females reported generally falls as status rises.

Chart 1 shows the age distributions of males and females in the four major social classes. Normally profiles by age yield roughly triangular shapes, particularly when populations are growing steadily over time. Here the triangular shape fits only for ages over 20 to 30 years old. Our profiles reflect only individuals reported in the census, not necessarily all individuals in residence. Presumably the children were actually there, but were left off the registers.[14] The underreporting of children seems especially pronounced among the yangban class.

Chart 2 shows the geographic distribution of various social classes across the *ri* or villages for each township. While the overall distribution of each class looks similar for each township, the distribution across villages is very heterogeneous. Some villages are clearly devoted to yangban farming and consist mostly of slaves, with few commoners and a substantial yangban presence. A good example of this is the first village in Shindŭng Township, named Tangye. Others are clearly manufacturing villages with mostly commoners and slaves and few yangban.

[13] (驛吏) Government workers at the postal stations.
[14] We note that radical changes in population, such as a war or famine could produce the profiles observed without underreporting. However, devastation sufficient to do so would have been truly remarkable and would not have escaped historical note. We also note that we have found similar patterns for Shindŭng Township in later years.

Artisans of a particular type are often concentrated in such villages. For example, of the twenty-four makers of porcelain[15], nineteen reside in the seventh village of Wŏndang Township.

2.2 Marriage Identification

Identifying marriage partners is sometimes problematic. Most matches are obvious; the male head of household is listed first and a female is listed as "wife". In some cases a son and daughter-in-law are listed. Ambiguities arise when more than one son and more than one daughter-in-law are listed in the same household. In some cases the order makes the marriage pairings obvious, but in other cases it does not. When in doubt, we matched the oldest husband with the oldest potential wife.

For resident slaves it is virtually impossible to match husbands and wives. This is because the relation listed is with the master as head of the household and this is always either *no* or *pi*. Undoubtedly most of these slaves were married, but the census does not readily give enough information to identify which males match up with which females. Hence a whole class of marriages is excluded from our analysis and we can make no reliable statements about the marriage patterns of resident slaves.

We identified 2031 primary marriages, i.e. where the woman is identified as *ch'ŏ*. The patterns across husband and wife's social status groups are given in the first panel of table 5. Generally husbands and wives tended to be of the same status. There are a few things that stand out in table 5, however. First, a small but sizable portion (around 9%) of yangban men were married to women with the title of *sosa*. This is starkly at odds with the accepted view of yangban marriage and deserves more detailed study in future work. Second, petty elite tended to marry women with the same *ssi* title as yangban, though almost a third of them married *sosa*. Four of these men took slaves as their primary wives. Third, while commoners and slave tended to marry within status (75% of commoner men and 80% of slave men did so), there are still large numbers of marriages where one spouse is a slave and the other is a commoner. Indeed, such marriages account for 336 of those we identified, which is almost 17% of the total.

[15] *sagijang* (沙器匠) in the registers.

Of the 2031 marriages in 1678, 45 carried designations indicating remarriage. The wife in these cases was listed as "second wife" (二妻) or "later wife" (末妻 or 後妻). Table 5 shows the patterns for these marriages in the second panel. Here it becomes clear that this designation was used primarily by commoners and slaves. This is not to imply that remarriage did not occur in the yangban and petty elite status groups. Rather it tells us that when such marriages occurred they were not distinguished from first marriages. A study of two consecutive censuses would shed a great deal of light on the patterns of remarriage.

There were a small number of ch'op listed. These marriages are listed in the second panel of table 5. The overall pattern is for yangban men to take women of *sosa* status. Commoners and petty elite also take *ch'op*, but they are more likely to be slaves.

To summarize, the static picture painted by the census is one where monogamy is by far the prevalent form of marriage. It is difficult to comment on the prevalence of remarriage using this data, however, since the designation "wife" does not necessarily imply first wife.

2.3 Ancestry and Marriage

We will formally examine parentage to examine its effects on choice of spouse in later sections. Here we wish to simply look at the overall patterns. Table 6 …

sorts husbands and wives, not by their own social status, but by the status of their father. In many cases father's status is unknown, however, so the number of marriages yielding useful information is smaller here. The picture is much the same with a few exceptions. First, sons of provisioners are much more likely than sons of other commoners to marry daughters of yangban. Since these sons are not yangban, table 7 shows us that they are not marrying yangban women, it followes they must be marrying either daughters from secondary marriages or illegitimate daughters. Second, sons of purchased title holders have a good chance of marrying daughters of yangban.

Finally, we look at marriage as explained by both personal status and parents status. Table 9 shows husbands sorted first by their own social status and then, within these groups, by the status of their fathers. Their wives are sorted by the status of their fathers. There are some interesting patterns here as well. First, yangban sons of yangban fathers overwhelmingly marry daughters of yangban (95% of the time). Second, within social classes,

husbands with higher status fathers, tend to marry daughters of higher status men. For example, among slave husbands, 11% of those with yangban fathers married daughters of yangban, versus 1% for sons of slaves. As above, these daughters of yangban are most likely children by secondary wives.

These tables give a broad look at overall tendencies in marriage. We examine these tendencies using more sophisticated statistical tools in next section.

3. Statistical Methodology & Results

3.1 Explanation of the Estimation Method

We examine marriage patterns by using multivariate LOGIT estimation. LOGIT estimation was developed to work with binary response variables; that is where a condition is either true or false. In quality control, for example, a particular unit will either pass a quality test or fail. In economics one might examine workers in the labor market and classify them as employed or unemployed. LOGIT estimation allows a researcher to determine which observable characteristics significantly influence the probability of falling into one category as opposed to another. In the manufacturing example, these characteristics could include the shift during which the item was produced, the particular machine that stamped the parts, the worker who assembled it, the supplier of the items parts, etc. In the labor market one might examine the worker's gender, ethnicity, education, geographic location, marital status, industry, etc.

Multivariate LOGIT estimation extends this procedure to allow for more than two outcomes. A memory chip, for example, may pass a test for low access speed, but not pass one for a higher speed. Individuals may be categorized as full-time employed, part-time employed, or unemployed. In our case we allow individuals to fall into four different marriage categories: 1) unmarried, 2) married to yangban, 3) married to commoner or 4) married to slave. The number of cases with marriage to someone of other status was so small that we dropped these from our sample. We use multivariate LOGIT estimation to examine how probabilities of falling into each of these categories differ according to observable characteristics of the individual. The characteristics we examine are: age, own social status, geographic location and ancestral status. We examine males and females in separate datasets.

A multivariate LOGIT model takes the following functional form:

$$pr(y_i = k) = \frac{\exp\{X_i\beta_k + e_{ik}\}}{\sum_{j=1}^{J}\exp\{X_i\beta_j + e_{ij}\}};\ k = 1,...,J \tag{3.1}$$

Here pr() denotes probability of the event in the parentheses. y_i is the value of the response variable for individual *i* (in our case marriage status) and takes on a value between 1 and 4. exp{x} is the exponential function e^x. X_i is a vector of observable characteristics for individual *i* which are discussed in more detail below. β_k is a vector of coefficients to be estimated for the case where the response takes on the value of *k* (again between 1 and 4). e_{ik} is a random component that cannot be identified by the researcher using the available data and which is uncorrelated with *X*. *J* is the number of different possible responses, in our case 4.

With *J* possible responses the researcher must estimate *J*-1 equations of the form above. The values for the final response are found by default. In our case we estimate three different equations where the responses are married to yangban, married to commoner, and married to slave. The default unestimated case is unmarried.

The nonlinear form of equation (3.1) ensures that no probabilities are ever less than zero or greater than one. The key element of the equation is the term, $X_i\beta_k$, which can be viewed as an index that influences probabilities. All else equal a higher value of $X_i\beta_k$ leads to a higher probability that the response variable y_i will take on the value of *k*.

A simple version of this index would be to include terms that control for an individual's own age and social status. Age is given by an integer value of zero or higher. Social status is indicated by a set of binary "dummy" variables that take on a value of one if the individual is of that particular social class and a value of zero otherwise. This simple index would be written as:

$$\mathrm{X_i}\beta_k = \beta_0 + \beta_{Ak}AGE_i + \beta_{Yk}YANG_i + \beta_{Ck}COM_i + \beta_{Sk}SLAVE_i \tag{3.2}$$

In this formulation the default individual is of "other" status; $\mathrm{YANG_i}$ is the yangban dummy variable, $\mathrm{COM_i}$ is the commoner dummy variable and SLAVE is the dummy variable indicating a slave. If the values of each of the β's in equation (3.2) were known, the index value for someone of "other" status of any age could be calculated by calculating $\beta_0 + \beta_{Ak}AGE_i$. Similarly the value of the index for a yangban would be calculated by $\beta_0 + \beta_{Ak}AGE_i + \beta_{Yk}$. For a commoner it would be $\mathrm{X_i}\beta_k = \beta_0 + \beta_{Ak}AGE_i + \beta_{Ck}$ and for a slave it would be $\mathrm{X_i}\beta_k = \beta_0 + \beta_{Ak}AGE_i + \beta_{Sk}$

To generate probabilities we need β's for all the possible responses, not just for response k. Since the β's are not known they must be estimated using statistical techniques. Before doing this, however, we discuss useful additions to the index.

The simple index in equation (3.2) is useful as an illustration, but not very useful in actual estimation. For one thing the functional form implies that the index value for all individuals rises with age, and that it does so at a constant rate. There are strong reasons for believing that this is not true in reality. We would expect value of the index to be low and change little for young children, for example. As people enter their late teens and early twenties we would expect the value of the index to rise as marriage becomes more likely. The index would level off and possibly even fall for older people as their spouses die and they become single again. To allow for this type of non-linear response we allow the index to vary not only with age, but also with the square and cube of age. In effect we allow the age profile of the index to follow a 3rd order polynomial function in age. In addition, there are strong reasons for believing that the age profiles for marriage status vary across social classes. For example, yangban women might tend to marry earlier than their commoner or slave counterparts. These effects can be estimated by allowing for cross-terms[16] between age and the "dummy" variables.

For ease of reporting we will often refer to sets variables with a single name. For example, AGE will hereafter be used to refer to the three terms: own age in years, own age squared, and own age cubed. OSTAT will refer to own status being a set of three dummies (slave, commoner, yangban). When cross terms are used we will denote these with a *. For example allowing different age effects within each social class would use the cross-terms denoted AGE*OSTAT

3.2 Results from a Baseline Model

As a first baseline model we estimate a model with the two sets of regressors, AGE and OSTAT and their cross-terms. The results of this estimation are listed in Table 10. Dropping resident slaves gives us 3544 males and 3320 females in our samples. Estimation is done by maximum likelihood which tries to find the values of the β's that maximize the probability of observing the actual data. We assume the unobservable errors in equation (3.2) are

[16] Cross-terms allow for a unique effect for all possible combinations of each variable, rather than simply adding the effects of the two variables.

distributed according to a normal or Gaussian distribution, commonly known as a bell curve. The value of the likelihood can be viewed as a measure of how well the model fits the data; higher values meaning a better fit.

Interpretation of these coefficients by themselves is difficult at best. However, it is possible to use them to generate plots of marriage probabilities as functions of age, for males and females of various social classes. These plots are show in Chart 3.

Several interesting patterns are noticeable. First, people tend to marry within their own social class, though not exclusively. Female yangban marry only yangban, but for other cases some intermarriage does occur. Male yangban in their 20's through 50's are three to four times more likely to be married to a yangban than a slave or commoner. By age 70, however, they are just as likely to be married to someone from a lower class as they are to be married to a yangban. This could be due to a tendency for male yangban to take on concubines or second wives as they get older. It could also be that yangban in their 60's and 70's who were married in the early 1600's were more likely to marry outside the yangban class than those who married at later dates. For commoners, both males and females, the chance of being married to another commoner is about three times higher than being married to a slave. Female commoners also have an increasing chance of being married to a yangban as their age rises. Roughly 20% of married commoner women are married to yangban at age 70. We note, however, that older women have a much lower chance of being married in the first place. For slaves, the patterns look almost identical to commoners, except that the bias is toward marrying other slaves.

Second, males tend to remain married at older ages, while women are much more likely to be single. This is true across all social classes and is undoubtedly driven by higher mortality rates for males. This means that very few females die before their spouse, leaving most older men married and many older women widowed.

Third, for all social classes, women tend to marry earlier than men. This is clear from Chart 4, which plots the aggregate probabilities of marriage (i.e. to a spouse of any social class) for males in red and females in blue. For females, the age at which the probability of marriage exceeds 50% is 21 for slaves and 20 for commoners & yangban. For males the corresponding ages are 25 for slaves & commoners, and 30 for yangban.

Finally, the probabilities of marriage by age look very similar for slaves and commoners, but yangban probabilities are different. Chart 5 plots the same probabilities as Chart 4, but groups them by sex. The plots for commoners and slaves are almost identical, while female yangban tend to marry earlier and male yangban tend to

marry later. Both male and female yangban have slightly lower probabilities of marriage than slaves and commoners.

As table 4 shows we have finer gradations for social class than those used above. When we group these gradations into useful categories we have only 4 for females: slave, commoner, yangban and other. This is because the bulk of females in the commoner category are identified by the *sosa* title, the bulk of female yangban have the *ssi* title, and the only slaves in the sample are non-resident.

For males, however, we are able to sort commoners into five meaningful categories: craftsmen, soldiers, provisioners, stationers, and other commoners. Yangban can be sorted into "true" yangban, and other yangban; the latter category including children of questionable status, as well as members of the *hyangni* and *sŏja* groups. We denote the set of dummy variables associated with this finer gradation of social class as OSTAT2. We wish to determine if these finer gradations of status within the three broad social classes yield a significant difference from the baseline model.

We estimate the equivalent of the baseline model using OSTAT2 in place of OSTAT. The baseline model can be viewed as a special case of this model where the estimated parameters are constrained to be the same for all subclasses within the same social class. This makes it possible to formally test whether or not the inclusion of more detailed status yields a significantly better description of the data. The likelihood ratio test statistic is 91.85, with a p-value of .0051[17]. This indicates that the additional gradations are a significant improvement with at least 99% confidence.

We next test to see if we can combine some of these categories without a significant loss in fit. A series of likelihood ratio tests are performed on variously restricted models. These are reported in table 11. As a result of these tests we find that soldiers, provisioners, stationers and other commoners do not differ from each other significantly, while craftsmen do have significantly different marriage patterns. We also find a significant difference for true yangban and other yangban. The results of this model; with individuals classified in six classes; slaves,

[17] The likelihood ratio test statistic is two times the difference in the log-likelihood values from the constrained and unconstrained models. It is distributed as a chi-squared distribution with degrees of freedom equal to the number of constraints. The p-value is the probability we would observe the reported statistic if the constraints were valid.

craftsmen, other commoners, true yangban, other yangban, or other[18]; are presented in table 12. Plots of the marriage probabilities are shown in chart 6.

The major differences noticeable between chart 3 and chart 6 are as follows. First, craftsmen tend to marry earlier than other commoners and up until age 59 have a slightly higher chance of being married. They are more likely to be single (presumably widowers) at older ages. This could be because they remarry less frequently when their wives die. Also for every age they are more likely to marry a commoner and less likely to marry a slave than other commoners. Second, while all yangban of the same age have roughly the same probability of being married (at least up to age 40 or so), "true" yangban are more likely to marry yangban and much less likely to marry slaves at relatively young ages. Older yangban of both categories are more likely to marry out of their social class as they get older.

Table 11 also includes tests of hypotheses[19] concerning equality of marriage patterns across social classes and subclasses. We always reject any hypothesis that individuals of a given social class have the same patterns as individuals in another class. We reject the hypothesis that craftsmen and other commoners have the same pattern with 95% confidence. We cannot reject the hypothesis that true yangban and other yangban have the same pattern, however. This latter result conflicts with the likelihood ratio test, which shows a significant gain in fit when yangban are divided into these two subclasses.

3.3 Effects of Ancestor Status

We now examine the impact of ancestry on marriage probabilities. As noted earlier, information on ancestry is recorded in the census. This information generally consists of a name and status/occupation for the individual's "four ancestors": father, grandfather, great grandfather, and maternal grandfather. This is generally the case for yangban. For commoners, it is not unusual for some of this information to be missing. Sometimes the ancestry is explicitly listed as "unknown"[20], but at other times it is simply not listed. For slaves, information on only one generation – father's and mother's status – is more common. We are able to classify ancestors in much the same

[18] We denote this set of dummy variables as OSTAT3.
[19] These are Wald tests.
[20] 不知

way that we classify the individuals themselves. As before we place them into one of the four major social classes: slave, commoner, yangban, or other. In addition, we allow for a fifth category, "missing", when no information is available for the ancestor.[21]

Tables 8 and 9 show a tendency within social classes for sons of higher status men to marry daughters of higher status men. To formally test the effects of ancestry we create several sets of dummy variables corresponding to the social status of various ancestors. We label these designations FSTAT, MSTAT, GFSTAT, GGFSTAT and MGFSTAT. Each consists of four dummies, one each for: slave, commoner, yangban and missing; "other" is the default category for which a dummy is omitted.

We note that mother's status is not explicitly recorded for yangban and for many commoners. Instead, the convention was to record the status of the maternal grandfather. We create another set of dummies which we label M2STAT, which takes the value of mother's status if recorded, and maternal grandfather's status if this is unavailable[22]. We now search for the appropriate combination of ancestor statuses.

First we estimate our baseline along with only one set of ancestor statuses (including cross-terms with own status), to determine which ones improve the fit the most. These results are shown in table 13, which shows that for both females and males, father status and our adjusted measure of mother's status are the two most important factors. Father's status is most important for males, and mother's status is most important for females.

We next fit a model with both father and mother's status and compare this with other models. First we test if the model fits significantly better than including father or mother's status alone and find it does for both males and females. We then test whether the fit improves significantly by adding all the omitted ancestor statuses. We find for males, that this is not the case. However, for females, the additional ancestor statuses add significant improvement.

We further test females by estimating a model with unadjusted mother's status and maternal grandfather's status. We find that this model fits better than the previous one, and that there is no significant gain from adding

[21] Many individuals do not have ancestry explicitly listed because it is implied. Children in a household with both parents living, for example, have no ancestry listed since it is redundant to record this information. Our sample counts these cases as missing, though it would be possible with some effort to fill in these cases with the appropriate ancestral status designations.

[22] We note that these new variables are nonlinear functions of the old ones. For example if x is a dummy for mother being a slave, and y is a dummy for maternal grandmother being a slave, then our modified mother-is-a-slave dummy, z, is $z = \frac{3}{2}(x+y)^2 - \frac{1}{2}(x+y)$. This makes testing via Likelihood ratio tests easier, because this model is nested inside a model with separate effects for mother's and maternal grandfather's status.

omitted ancestors. The above tests are all reported in table 13. We label these new models PBaseline[23]. For males it is: (AGE FSTAT M2STAT)*OSTAT3. For females it is: (AGE FSTAT MSTAT MGFSTAT)*OSTAT3.

The estimated coefficients and standard errors from these two models are reported in table 13. Note that because some possible combinations never occur in the data, it was necessary to drop some coefficients. Selected plots are presented in charts 7 – 9.

While it is difficult to generalize what these graphs show, there seems to be a pattern of assortive mating based on parent's status. Having a mother or father of higher status appears to increase the probability of marrying a higher status spouse. The one major exception being that yangban women always marry yangban men. We consider the issue of assertive mating in more detail in section 3.5.

3.4 Effects of Geographic Location

Finally we test for the effects of geographic location. We do this by constructing two sets of dummy variables. First we create a set of 7 dummy variables for the eight townships, which we denote LOC1. We estimate PBaseline along with this set of dummies. These give a significantly better fit, as shown in table 16. We then create a set of 59 dummies for the 60 different villages. The above township model is a special case of this where coefficients on the dummies for all villages within a township are constrained to be equal. This model results in a much bigger increase in the goodness of fit. We view this as evidence that something about village structure significantly influences marriage probabilities, and that the effects of living in a particular township are dwarfed by these village-level effects. We also note that these effects are present even controlling for the effects of own status and parentage.

3.5 Evidence on Assorting Mating

It is clear from the above evidence that men and women in traditional Korea had strong preferences or societal pressures to marry within their own social class. There is weaker evidence that marriages tended to sort by parent's status as well. To examine the similarity of spouses we adopt a new approach.

[23] For baseline with parentage.

We first construct a sample of all regular marriages[24]. We then construct a vector of observable characteristics for both husband and wife in each marriage. These characteristics include: age, own status and status of ancestors. Location characteristics are not useful, since both spouses reside in the same place. We encode status using sets of dummy variables as before. We then calculate the means and standard deviations of these characteristics over the whole sample of married men and women. These are reported in table 17. For the dummy variables, averages are equivalent to the percentage of the population that have that characteristic.

More interesting are the correlations of characteristics across our sample between husbands and wives. For example, the mean age of husbands is 42 and for wives it is 37; a difference of 5 years. A correlation coefficient will tell us how well husband and wife ages match up on average. If all husbands are 5 years older than their spouse, then the correlation will be one, but if they match up randomly it will be zero. For our sample, the correlation is .821, indicating (not surprisingly) a strong tendency to match by age.

We can calculate similar correlations for sets of status dummy variables. These are presented in table 18. Since these are binary variables, a positive correlation means that the husband's characteristic tends to be 1 when the wife's is one and zero when hers is zero. Negative values mean the opposite. The diagonal elements correspond to cases where the husband and wife have the same characteristic. Since these are uniformly positive and the off-diagonal elements tend to be negative, this is also evidence of a strong tendency to match by status. We note that the correlations are strongest for yangban, and are weaker for grandparents than for parents. No yangban have mothers listed, so the columns and rows from this table are meaningless. Mother's slave status correlation is strongly positive, indicating sons of slaves tend to marry daughters of slaves. Correlations are also positive for Mother's status being commoner and the off diagonals between slave and commoner are also positive, though not big.

Table 19 presents similar correlations for own status with spouse's parent's status. Again the pattern of matching is evident by the positive diagonal elements for both wives and husbands with their spouse's fathers. The correlations with spouse's mothers are weaker, except for slaves.

[24] i.e. excluding secondary marriages to the degree possible

4. Conclusions and Areas for Further Research

This paper has examined patterns of marriage in Tansŏng country in 1678. Using multivariate LOGIT estimation we have found that there is a strong pattern of marriage within one's own social class broadly defined. This pattern holds for both males and females. Despite this overall tendency, we find significant probabilities of intermarriage for commoners and slaves. For both males and females of commoner and slave status, the probability of marrying outside one's own social class conditional on being married is somewhere between 10 and 20%. For yangban, the patterns are markedly different. Yangban females never marry outside the yangban class, but yangban males have significant probabilities of marrying slaves or commoners that increase with age. Much of this may be due to the way yangban women are identified. For example, a woman of yangban status might automatically lose her *ssi* title and be called *sosa* instead if she marries a commoner. These women would show up as commoners in our sample. For males, it is not clear how much of intermarriage at later ages is due to different marriage patterns when these men were young, and how much is due to marriage with second wives. The sample is restricted to full wives[25], however, and does not include concubines[26]. Both of these issues could be clarified if we had observations from other years and could observe changes in status or marriage to second wives after the death of a first wife.

We also identify significantly different marriage patterns for groups of males within social classes. We find that craftsmen and artisans have different marriage patterns than other commoners, being less likely to marry slaves. We also find that true yangban are much more likely to marry within their class than "other" yangban; the latter category including *sŏja*, *hyangni*, and others of marginal yangban status. Here the differences are quite large, with the probability of marrying a slave being around three times higher for "other" yangban.

We find strong effects of parentage on marriages patterns. The effects of father's status being most important, but mother's status being almost as important for females. Generally speaking, having a parent of higher social status increases the probability of marrying a spouse of higher status, and visa-versa. This is true for males and females of all classes.

Finally, we find strong effects of location on marriage patterns. These effects appear to be concentrated at the village level. We cannot identify the mechanism, but there are a variety of plausible causes. First, it may be that

[25] women listed as ch'ŏ (妻)
[26] women listed as ch'ŏp (妾)

most marriages occur between people of the same village, though this seems unlikely given the degree of village exogamy found by most anthropological studies of Korean marriage. Under this scenario, villages with high concentrations of commoners would be more likely to result in slaves marrying outside their class. Second, villages may be proxying for other sorts of social behavior. For example, if potters tend to arrange marriage of their children to children of other potters and potters reside only a few villages, then village effects would be quite large.

While this study has shed new light on marriage dynamics in traditional Korea, there is much work that could still be done. The greatest benefit would be to extend our sample to include other census years. This would allow us to estimate cohort as well as age effects. This would allow us to examine how marriage patterns changed over time. In addition, if we can use a pair of censuses only three years apart, we could identify changes in social status. This might shed more light on the strong preference for yangban husbands displayed by yangban women.

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Table 1
Coverage of the Tansŏng Census by Year

1678
1717, 1720
1729, 1732, 1735
1750
1759, 1762
1780, 1783, 1786, 1789

Table 2
Township Divisions of the Tansŏng Census

Wŏndang (元堂)

Hyŏnnae (縣內)

Pukdong (北洞)

Odong (悟洞)

Tosan (都山)

Saengbiryang (生比良)

Shindŭng (新燈)

Pŏpmulya (法勿也)

Table 3
Population and Household Size
Based on Census Summaries

year	households	population
1678	1113	8321
1714	2005	9131
1717	2278	10603
1720	2514	11943
1726	2558	12853
1729	2914	13178
1732	2925	13225
1735	2584	missing
1753	2609	12463
1756	2941	13486
1759	2941	13498
1762	2944	13505
1777	2805	13149
1780	2996	13804
1783	3001	13819
1786	3001	13828
1789	3012	13839

Table 4
Distribution of Residents by Social Class & Sex

Males		
Yangban	**345**	**8.3%**
Petty Elite	**158**	**3.8%**
Commoners	**1310**	**31.6%**
Craftsmen	151	3.6%
Soldiers	369	8.9%
Provisioners	431	10.4%
Yŏngni	79	1.9%
Misc Commoners	280	6.7%
Slaves	**2147**	**51.7%**
Non-resident Slaves	1531	36.9%
Resident Slaves	616	14.8%
Other	**189**	**4.6%**
TOTAL	4149	
Females		
Ssi	**294**	**7.1%**
Sosa	**617**	**14.9%**
Commoners	**749**	**18.1%**
Slaves	**2304**	**55.6%**
Non-resident Slaves	1474	35.5%
Resident Slaves	830	20.0%
Other	**183**	**4.4%**
TOTAL	4147	

Table 5
Marriages Identified

Primary Wives (Ch'ŏ)

	ssi	sosa	commoner	slave	other	total
yangban	144	15			8	**167**
petty elite	53	23	2	4	3	**85**
commoner		368	212	164	24	**768**
slave		32	140	795	22	**989**
other	2	6	3	8	3	**22**
total	**199**	**444**	**357**	**971**	**60**	**2031**

Second Wives Only

	ssi	sosa	slave	other	total
yangban	1				**1**
commoner		6	6	3	**15**
slave		2	25		**27**
other		1	1		**2**
total	**1**	**9**	**32**	**3**	**45**

Ch' ŏp

	sosa	commoner	slave	total
yangban	12	1		**13**
petty elite	3		2	**5**
commoner	1	1	4	**6**
other	1			**1**
total	**17**	**2**	**6**	**25**

Table 5
Marriages by Husband's Status/Father and Wife's Status

Husband	Father	Number of Marriages: ssi	sosa	commoner	slave	other	Percent: ssi	sosa	commoner	slave	other
Y	Y	123	12			7	87%	8%			5%
Y	P	7	2			0	78%	22%			0%
Y	C										
Y	S										
Y	O	14	1			1	88%	6%			6%
P	Y	198	86	12	14	12	61%	27%	4%	4%	4%
P	P	84	50			6	60%	36%			4%
P	C		35	15	21	2		48%	21%	29%	3%
P	S		2	1	3	0		33%	17%	50%	
P	O	36	19	10	14	0	46%	24%	13%	18%	
C	Y		90	3	16	2		81%	3%	14%	2%
C	P		20					100%			
C	C		252	177	117	19		45%	31%	21%	3%
C	S		11	9	18			29%	24%	47%	
C	O		157	101	97	9		43%	28%	27%	2%
S	Y		9	15	93			8%	13%	79%	
S	P			3	15				17%	83%	
S	C		21	42	219	3		7%	15%	77%	1%
S	S		32	251	1542	39		2%	13%	83%	2%
S	O		30	105	516	24		4%	16%	76%	4%
O	Y	1	3			1	20%	60%			20%
O	P				1					100%	
O	C		2	10	9			10%	48%	43%	
O	S										
O	O	1	9	9	46	18	1%	11%	11%	55%	22%

Y yangban
P petty elite
C commoner
S slave
O other

Figure 1

Typical Census Page

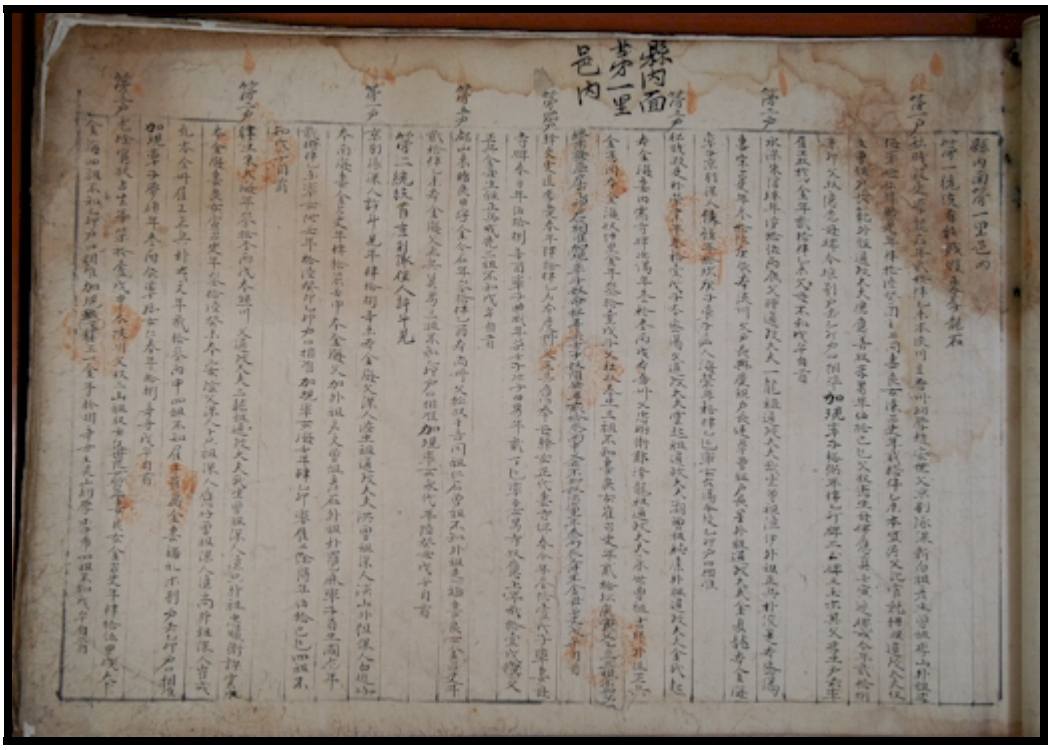


Figure 2

Corresponding Entries in Sunggyunkwan Dataset

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	原本	年度	面名	順番	里	村	統	統首	戶	主戶	戶內位相	血緣	男女	職役	姓	名	年齡	干支	出入	處	加入	本
2	원1	1678	현내	1	1	읍내	1	통수	1	이용석	주호	a	m	사천가리	이	용석	24	을미				본
3	원1	1678	현내	2	1	읍내	1		1	이용석	모	a	f	사비		조시	46	계유				
4	원1	1678	현내	3	1	읍내	1		1	이용석	처	a	f	양녀	진	소사	24	을미				본
5	원1	1678	현내	4	1	읍내	1		1	이용석	노비	c	m	노		이남	50	기사	도임인			
6	원1	1678	현내	5	1	읍내	1		1	이용석	노비	c	f	비		계금	28	신묘	별호거			
7	원1	1678	현내	6	1	읍내	1		1	이용석	자	a	m			유필	4	을묘			가현자수	
8	원1	1678	현내	7	1	읍내	1		1	이용석	노비	c	f	비		이옥			호거	기부이생	가현자수	
9	원1	1678	현내	8	1	읍내	1		1	이용석	노비	c	f	비		삼목			호거	기부이생	가현자수	
10	원1	1678	현내	9	1	읍내	1		1	이용석	고공	c	m	노		어질금	24	을미			가현자수	
11	원1	1678	현내	10	1	읍내	1		2	주신주	주호	a	m	수보	주	신주	65	병진				
12	원1	1678	현내	11	1	읍내	1		2	주신주	처	a	f		송	소사	39	경자				본
13	원1	1678	현내	12	1	읍내	1		2	주신주	자	a	m	경별보인		철추	19	경자				
14	원1	1678	현내	13	1	읍내	1		2	주신주	자	a	m	병인		해영	14	을사				
15	원1	1678	현내	14	1	읍내	1		2	주신주	녀	a	f			태양			금고			
16	원1	1678	현내	15	1	읍내	1		3	박영업	주호	a	m	사천가리	박	영업	31	무자				본
17	원1	1678	현내	16	1	읍내	1		3	박영업	처	a	f	내수사비		차양	33	병술				본
18	원1	1678	현내	17	1	읍내	1		3	박영업	노비	c	m	노		건리금	31	무자				
19	원1	1678	현내	18	1	읍내	1		3	박영업	노처	c	f	양녀	최	소사	29	경인				
20	원1	1678	현내	19	1	읍내	1		3	박영업	노비	c	f	비		증말			호거	발익		
21	원1	1678	현내	20	1	읍내	1		3	박영업	자	a	m	노		명지	7	임자			가현자수	
22	원1	1678	현내	21	1	읍내	1		3	박영업	노비	c	m	노		순발	23	병신			가현자수	
23	원1	1678	현내	22	1	읍내	1		3	박영업	노비	c	m	노		담사리	3	병진			가현자수	
24	원1	1678	현내	23	1	읍내	1		4	이애봉	주호	a	m	역리피장	이	애봉	44	을해			가호자수	본
25	원1	1678	현내	24	1	읍내	1		4	이애봉	처	a	f	시비		춘금	31	무자			가호자수	
26	원1	1678	현내	25	1	읍내	1		4	이애봉	처모	b	f	시비		춘일	58	신유			가호자수	
27	원1	1678	현내	26	1	읍내	1		4	이애봉	자	a	m			곡성	7	임자			가호자수	

Chart 1

Age Distribution of Females and Males by Social Class

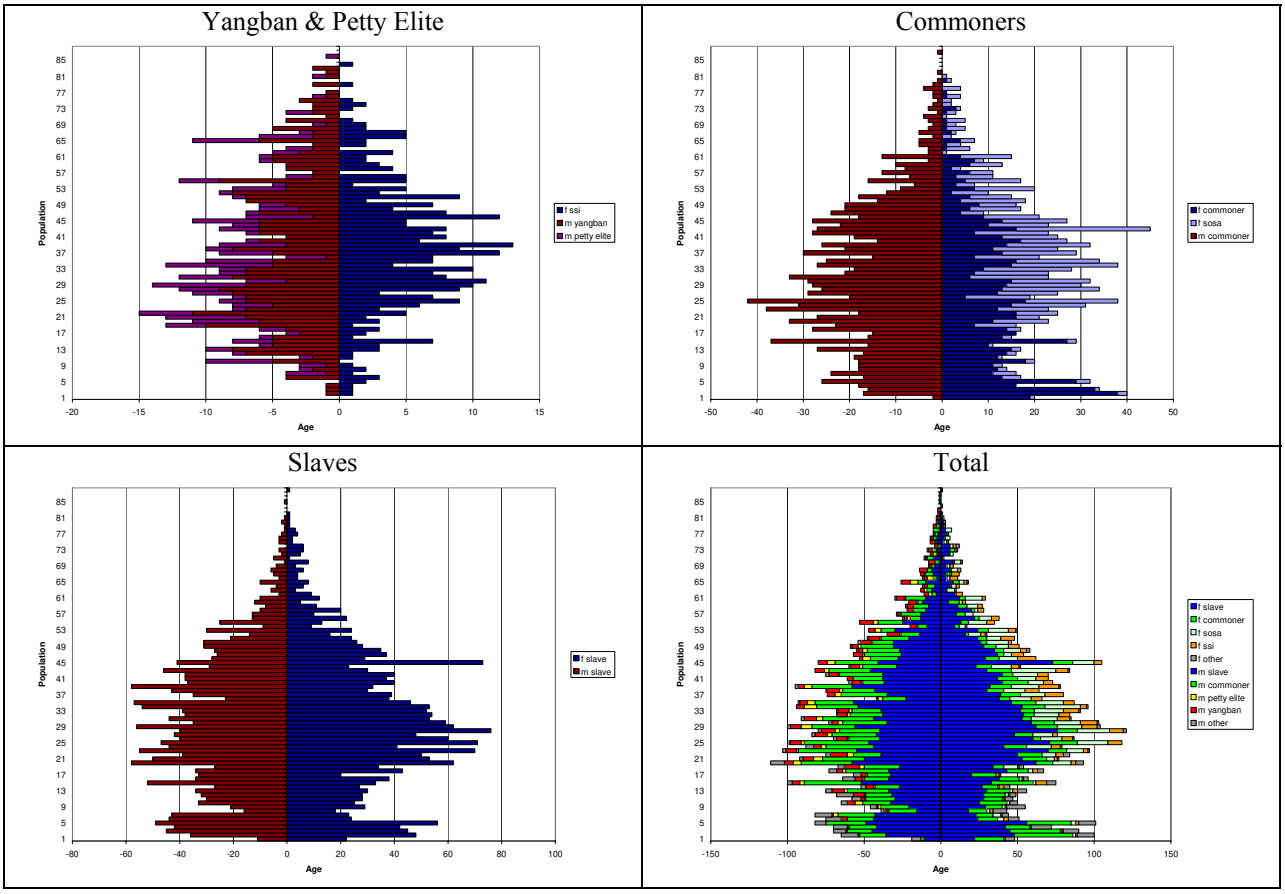
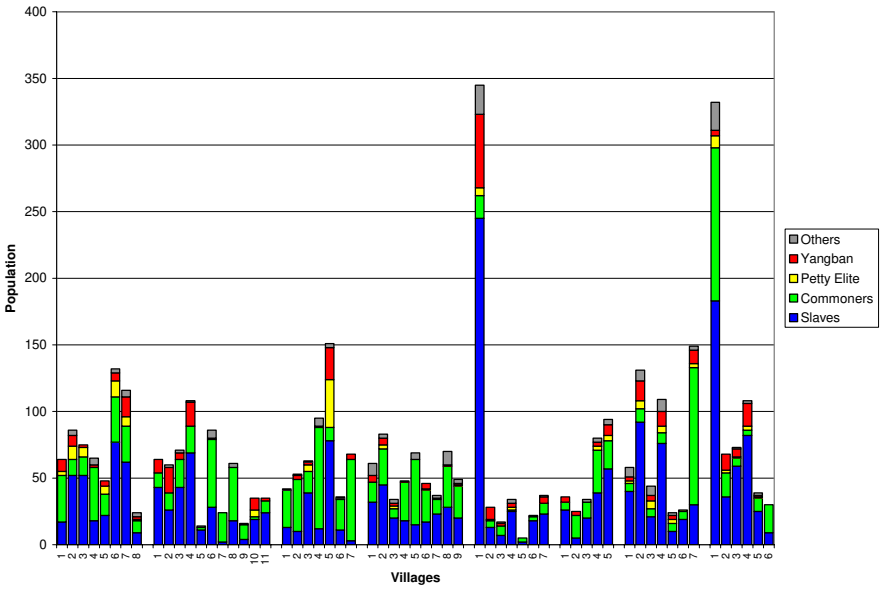


Chart 2

Distribution of Social Classes by Village within Townships

Males



Females

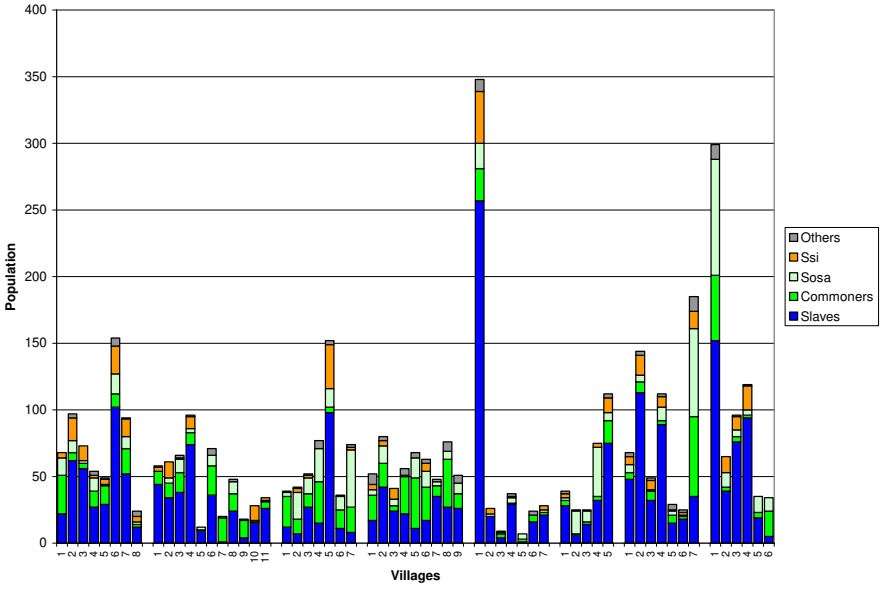


Chart 3

Marriage Probabilities by Sex and Social Class

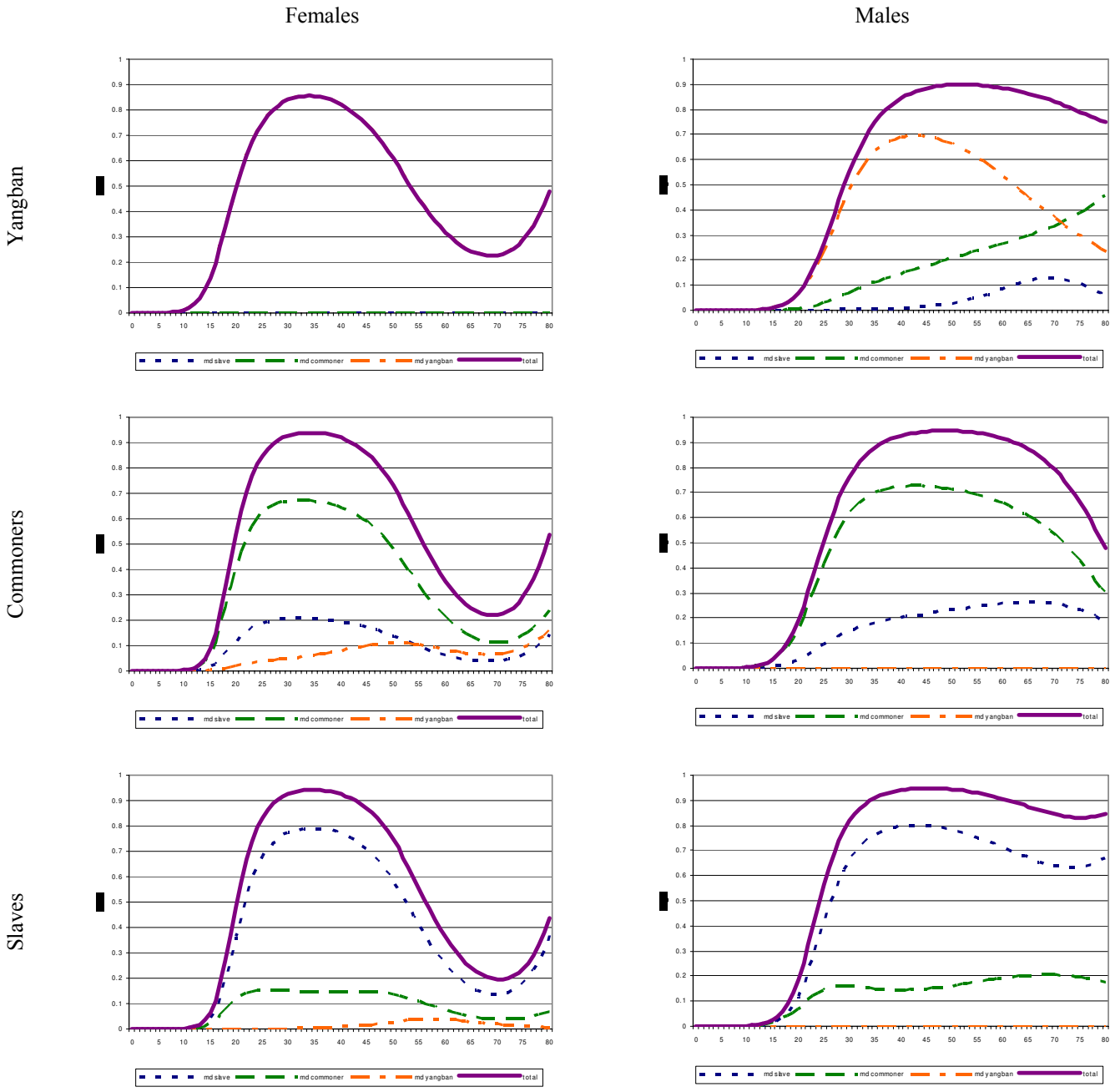
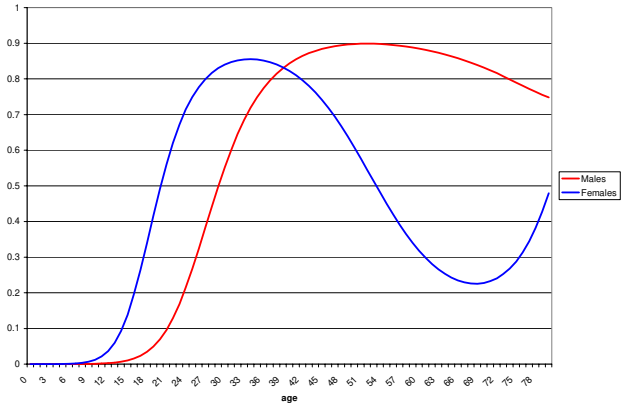


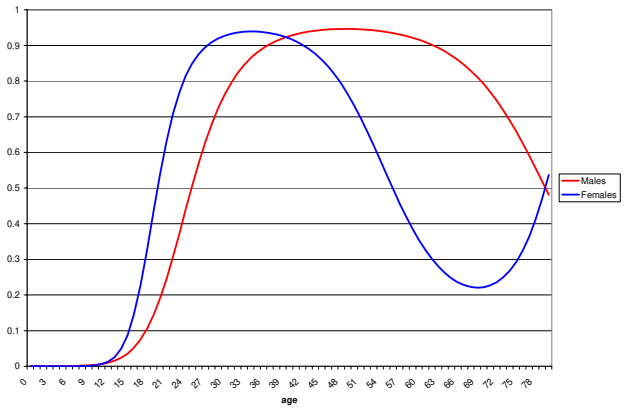
Chart 4

Probabilities of Marriage for Females vs Males by Social Class

Yangban



Commoners



Slaves

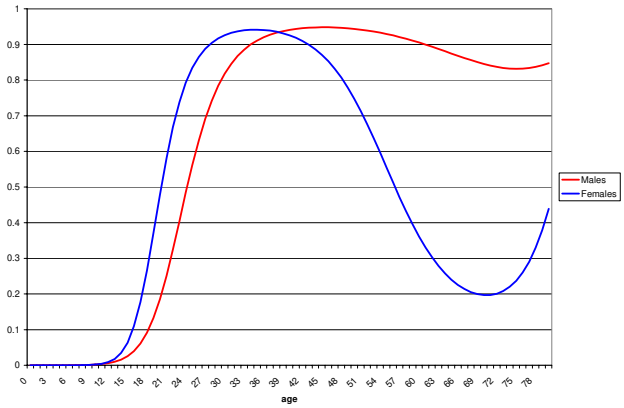
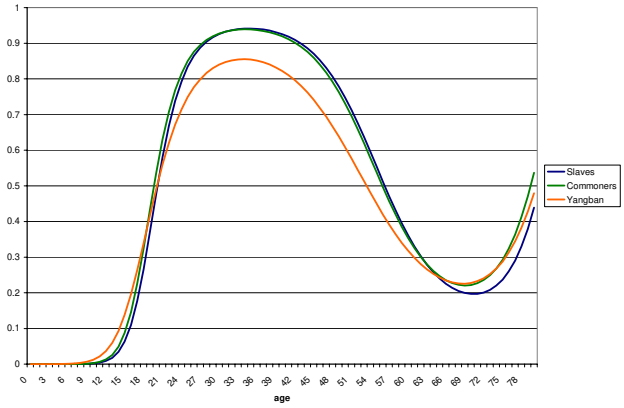


Chart 5

Probabilities of Marriage for Each Social Class by Sex

Females



Males

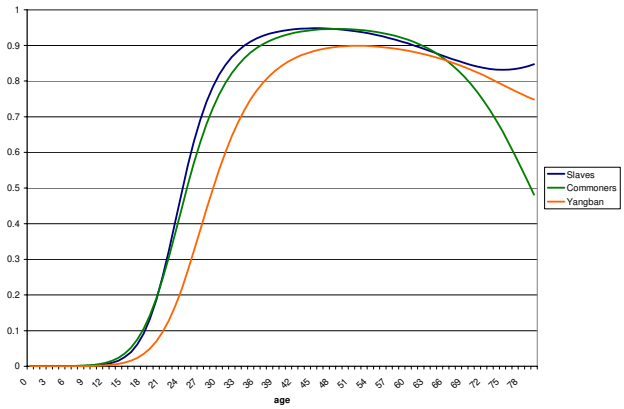
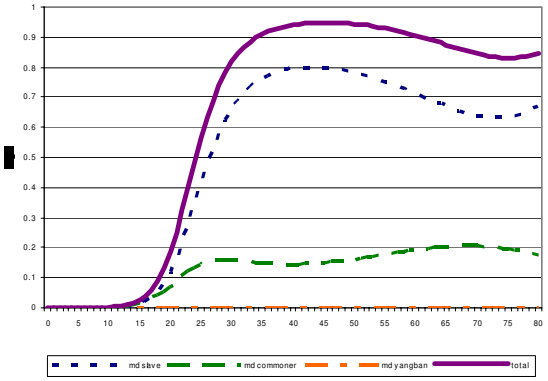
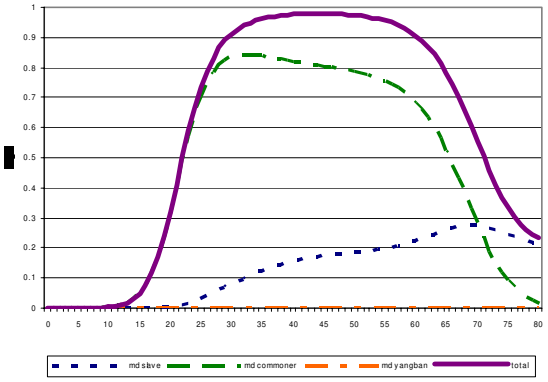


Chart 6
Male Marriage Probabilities by Expanded Status

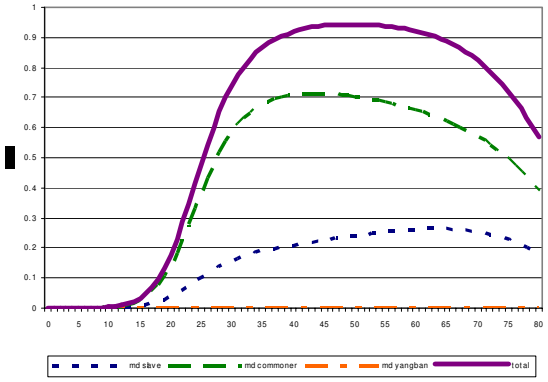
Slaves



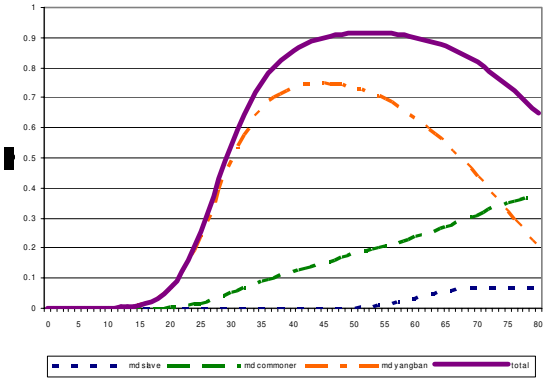
Craftsmen



Other Commoners



True Yangban



Other Yangban

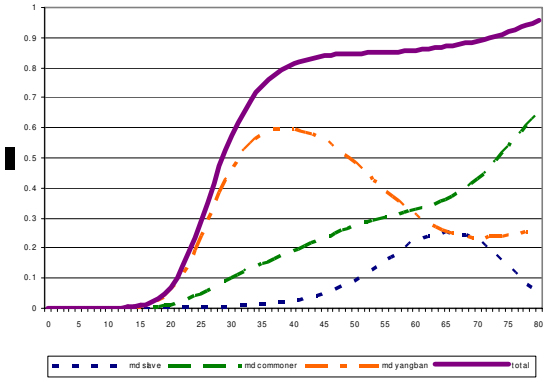
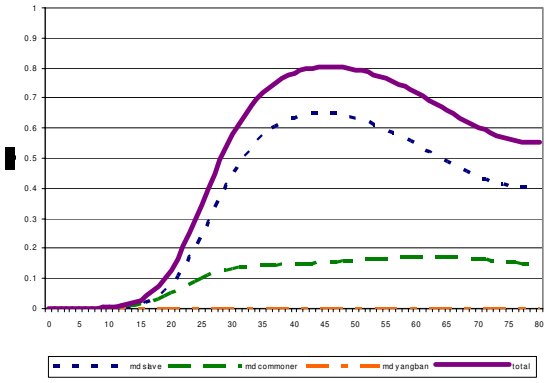


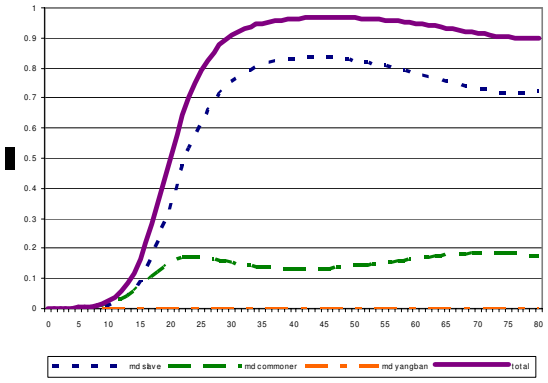
Chart 7

Selected Marriage Probabilities of Male Slaves by Parents' Status for Slaves

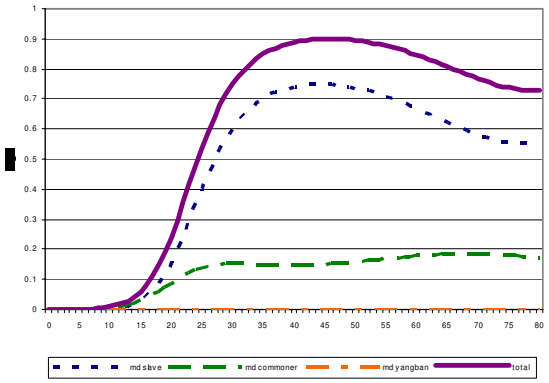
Father & Mother's Status Not Listed (634 cases)



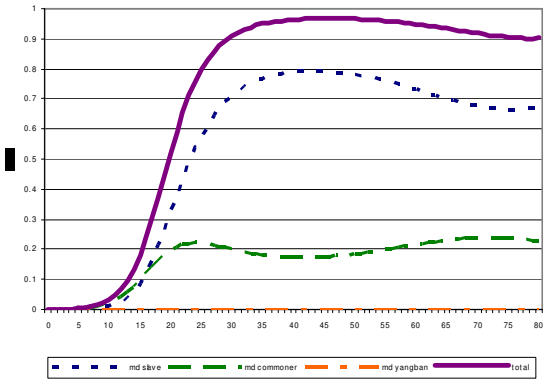
Father & Mother are both Slaves (518 cases)



Father's Status Not Listed, Mother is Slave (105 Cases)



Father is Commoner, Mother is Slave (82 cases)



Father is Yangban, Mother is Slave (29 cases)

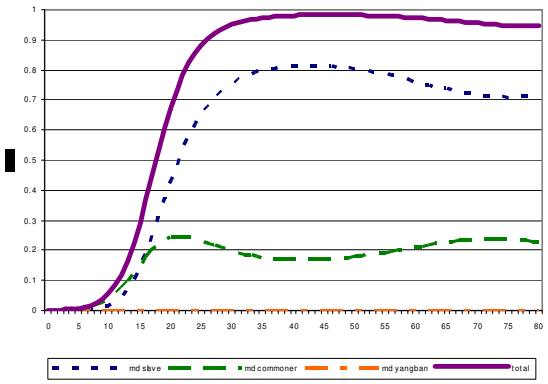
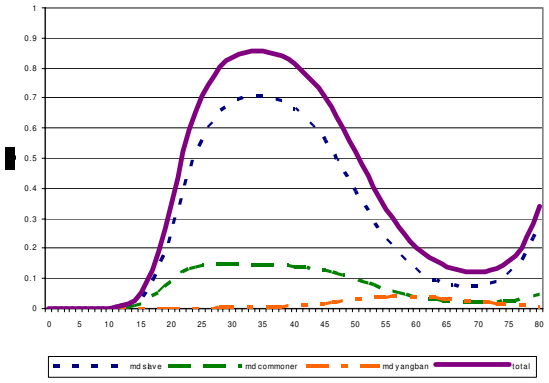


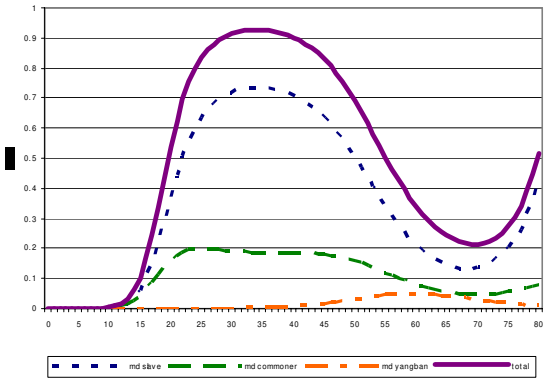
Chart 8

Selected Marriage Probabilities of Female Slaves by Parents' Status for Slaves

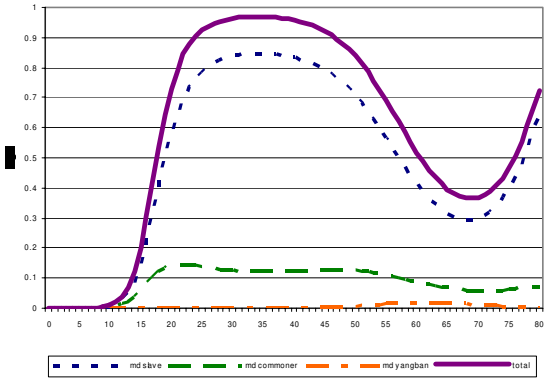
Ancestor Status Not Listed (630 cases)



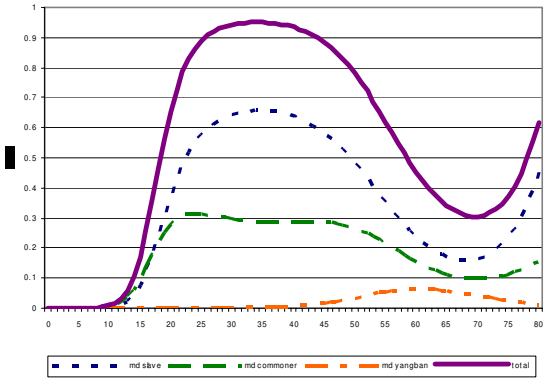
Father is Slave, Other Ancestors Not Listed (86 cases)



Father and Mother are Slaves, MGF Not Listed (380 cases)



Father is Commoner, Other Ancestors Not Listed (20 cases)



Mother is Slave, Other Ancestors Not Listed (165 cases)

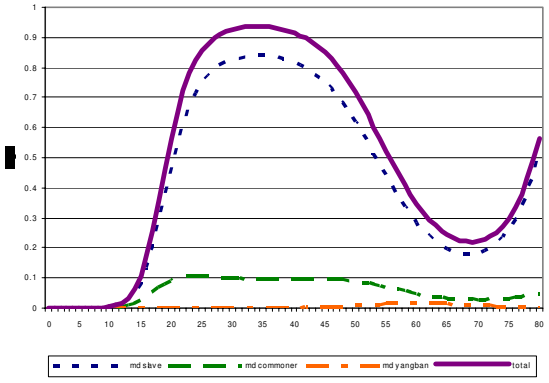
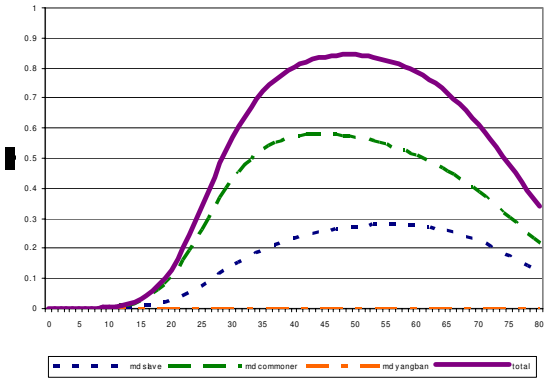


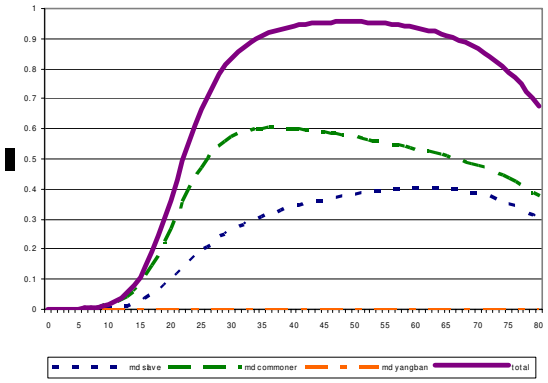
Chart 9

Selected Marriage Probabilities of Slaves by Parents' Status for Male Non-Craftsmen Commoners

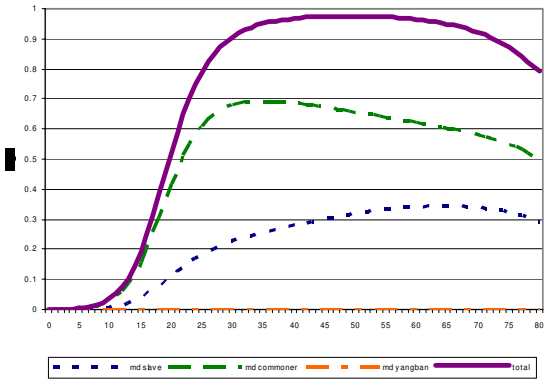
Father & Mother's Status Not Listed (659 cases)



Father is Commoner, Mother's Status Unknown (81 cases)



Father and Mother both Commoners (221 cases)



Father is Yangban, Mother's Status Unknown (13 cases)