Why Some Rural Chinese Men Cannot Get Married at the Expected Age: 
A Social Network Perspective

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Abstract: If a man has a matchmaking network, will this increase his chance of marrying? If so, do the different types of network ties play different roles? Using survey data from X County in Anhui Province (N = 412), we analyze the determinants of first marriage probability for 18 to 50-year-old rural Chinese men in terms of their social networks. Age at first marriage for rural Chinese men is concentrated in the interval between 22 and 27 years. Unmarried men aged 28 and older have become a vulnerable group in the marriage market because their probability of getting married is markedly lower. A man’s characteristics and possession of resources, including his matchmaking network, as well as individual, family and community factors, are likely to affect the probability that he marries. The chance that men with poorer individual and family characteristics and fewer resources succeed in making a first marriage is markedly reduced.

Key words: matchmaking networks; age at first marriage; involuntary bachelors; marriage market; probability of first marriage
Introduction

In recent years, in contrast to the decline of the marriage rate in the United States and Europe (Crowder and Tolnay 2000), the marriage rate in China has remained high. According to a calculation by Davin (2007) based on 1990 and 2000 census data, the marriage rate of the Chinese population is over 95% for both men and women who reach their late 30s. These data indicate that a “universal marriage” culture still exists in China. However, because of China’s increasingly unbalanced sex ratio at birth and excess female child mortality, some men are finding it more difficult to find a wife. Li et al. (2006) have predicted that the fraction of surplus men among China’s adult male population will exceed 10% after the year 2013 and about 1.2 million men on average will fail to find a first wife each year. At present, in addition to an increasing number of reported “bachelor villages” (a name used by some news agencies for villages with a high percentage of involuntary bachelors), deficits of women have been found in some rural areas of all provinces in China (Davin 2007). A survey conducted in 364 villages of 28 provinces of China found that there were at least 9 involuntary bachelors aged 28 and older on average per village (Jin et al. 2010).

In China, involuntary bachelors, often pejoratively called “bare branches,” are never-married men who want to get married, but cannot at a marriageable age for reasons such as poverty, limited individual ability or physical disability. Data from the 1% national population sample survey of China in 2005 shows that the average age at first marriage for rural men is 25.05 years. In general, in rural areas, few first marriages occur after age 30 (Das Gupta et al. 2010), so if a man is not married before the age of 30, he will have difficulty getting married and be at risk of being forced to remain unmarried for his whole life. These involuntary bachelors are victims of the marriage squeeze (Chen 2004).

Sons are still the main source of old-age support in rural China. Lifelong involuntary bachelors who will have no children to rely on in their old age therefore become a truly
vulnerable group (Shi 2006). Failure to marry may develop into a personal stigma and even threaten social stability (Mo 2005). Although involuntary bachelors are often found to be honest and upright (Peng 2004), they are believed by an increasing number of people to be a potential threat to social stability. For example, Hudson and den Boer (2002) are concerned that China’s contemporary involuntary bachelors may endanger international security, while Perry (1980) indicates how, in the midst of chronic poverty in the late 19th and early 20th centuries, a large population of surplus males helped fuel endemic violence. Perceptions of unmarried men as “rootless” and frightening have a long history in China. In the late imperial novel Shuihuzhuan, older unmarried men are depicted as single rogue males on the road making a living through violence, shunning “decent society,” and defying normative values and civil authority (in this counter-discourse novel they are glorified as anti-heroes). Such portrayals can prove dangerous. Kuhn (1990) documents 18th-century hysteria which spread to educated officials as well as among commoners, causing violence against migrant men as fears of rootless single men were incited. Therefore, whether because of concerns about this vulnerable group’s well-being or concerns about maintaining social order, it is important to explore problems associated with the marriage squeeze affecting men in rural China.

Men’s difficulty in marrying is receiving increasing attention from the Chinese government and society. Some scholars (e.g., Chen 2004; Liu 2005; Lu 2006; Zhang and Zhong, 2005; Jin et al. 2010; Das Gupta et al. 2010) have begun to explore the determinants and potential consequences of men being forced to remain unmarried as well as measures to improve the well-being of these involuntary bachelors. Generally speaking, under the current male marriage squeeze in China, men’s individual socio-economic attributes are important in determining their attractiveness in the marriage market. Women are more likely to marry men with better jobs, higher social status, and higher incomes (Liu 2005). Indeed, many women have migrated from inland to coastal areas or from mountains to plain regions with the intention of making better marriages. This migration has created geographic variability in the severity of the marriage
squeeze. Men in poverty-stricken rural and remote mountainous areas comprise the majority of victims of the marriage squeeze (Liu 2005; Lu 2006; Zhang and Zhong 2005; Davin 2007; Das Gupta et al. 2010). Families that are poor or have many sons cannot afford the immense amounts of money necessary to contract a marriage (Zhang and Zhong 2005; Lu 2006). Men who are poor due to unemployment or lack of the skills to earn enough money or who are unable to purchase a new house have difficulty getting married (Hudson and den Boer 2002; Peng 2004; Das Gupta et al. 2010). In addition, individual characteristics play important roles. For example, men who are older, less educated, more introverted, and poor communicators will have fewer opportunities to find brides (Peng 2004; Ye and Lin 1998; Zhang and Zhong 2005).

Social networks are important components of the marriage process in China. Finding a bride can be seen as utilizing social networks to seek new social resources (Zhou and Liu 2007; Kalmijn 1998; Xia and Zhou 2003). Under pressure from the marriage squeeze and the rising cost of marriage, social networks, especially matchmaking networks and loan networks, are important in providing opportunities for single rural men to get to know women and to borrow enough money for marriage. Therefore they are likely to have direct impacts on success in finding a bride and getting married. Although social networks have been well studied since the 1970s in the social and behavioral sciences (Wasserman and Faust 1994), there has been little research on their role in the marriage process. A few studies (Zhou and Liu 2007; Xu and Li 2004; Kalmijn 1998; Xia and Zhou 2003) have mentioned the roles of network in contracting a marriage, but quantitative analysis has not been used to explore the relationship between networks and the probability of first marriage. Most studies of the marriage squeeze affecting Chinese men use qualitative methods or case studies. The rich material in those studies provides important background for this paper.

In this study, we are concerned with rural men’s matchmaking network, a social network in which members introduce unmarried women to unmarried men. If a rural man possesses a matchmaking network before marriage, does it increase his opportunities to get to know women,
thereby increasing his chance of marrying? Using data from the survey “Gender Imbalance and Social Stability: Life of the Rural Population in Anhui” conducted in X County (a pseudonym) of Anhui Province, we apply event history analysis to explore factors affecting rural men’s probability of first marriage from the perspective of matchmaking networks.

**Theory and hypotheses**

Marriage market theory can be applied to rural men’s probability of first marriage under the current male marriage squeeze. This theory is often applied to explain marital phenomena and the consequences of imbalance between supply and demand in the marriage market. It proposes that individual social and economic characteristics and resources determine the criteria for selecting one’s future partner and also determine who is likely to be in an inferior position in the market (e.g., Tucker and Taylor 1989; South 1991). With a male surplus in the marriage market, not everyone faces the same risk of being forced to remain unmarried. Men with different individual characteristics and resources will have different probabilities of marriage. Generally speaking, men with high socio-economic status are likely to have plenty of potential marriage alternatives and higher rates of marriage (South 1991; Das Gupta et al. 2010).

**Matchmaking network characteristics**

In contemporary rural China, the process by which a man achieves a marriage includes getting to know women and paying the high costs that marriage involves. The former is the first step in the process, and having others introduce a woman and making the acquaintance of a woman independently are the two main ways men get to know their future spouses (Zhou and Liu 2007). In the period of Chinese history which most Chinese today think of as “traditional” – roughly 1500 through 1950 – most marriages were arranged by parents (e.g., Wolf and Huang 1980; Ebrey 1991, Gates 1996), thus relying on the social network of the groom’s (or bride’s) family. In contemporary China, a matchmaker, who may be a relative or another network member,
still often helps a man and a woman to meet; even in inter-provincial “rural-rural” marriage, or transnational marriage from poor countries to richer countries, matchmakers (including independent brokers) play important roles (Han and Eades 1995; Yan 2002; Wang and Chang 2002). Relationships between a person and his or her network members, including kin, neighbors, friends, colleagues, and so on, remain important for unmarried persons who haven’t found suitable partners (Xia and Zhou 2003). However, kinship’s once-dominant role in this process is being replaced by the role of friends and colleagues (Xu and Li 2004; Tian 2001). Moreover, the proportion of free choice of partners is increasing steadily and the fraction of marriages where partners are introduced is decreasing. In some urban areas, the former is now the most common (Xu and Li 2004; Ye and Ye 2005). Thus, we ask, in rural China, is the matchmaking network still important for men’s ability to marry? If so, are there some differences among the roles of different types of network ties?

Social networks can be characterized by a number of structural elements, including size, density, configuration of ties, homogeneity, and so on (see also Tucker and Mitchell-Kernan 1990; White and Riedmann 1992). In this study, we measure the matchmaking network by size and configuration of network ties. Network size is the number of network members; normally, the larger a person’s social network, the more social capital he or she possesses and the more likely it is that he or she occupies an advantageous position in society (Coleman 1988). Network tie configuration of a focal person is the set of relations between that person and members of the network. It is usually measured in terms of strong and weak ties, or kin and non-kin ties, or relatives, neighbors, friends, and so on (e.g., Merz and Oliver 2010; Xia and Zhou 2003; Lai 1998).

In this study, in order to recognize how and whether tie configuration contributes to successful arrangement of a man’s marriage, we will measure tie configuration in two steps. First we determine whether he does or does not have a network. Then we characterize the network as having only kin ties, only non-kin ties, or both kin and non-kin ties. Our first hypothesis is: the
poorer the matchmaking network resources that a rural man possesses, the lower his probability of marriage. This hypothesis includes three components: (1) men with a larger matchmaking network are more likely to marry; (2) compared to men without a matchmaking network, men with such a network are more likely to marry; (3) there are significant differences among the roles of different tie configurations.

*Individual characteristics*

Recent studies emphasize the important role of individual socioeconomic status in achieving a marriage, including occupation, income, education, and social status. For example, studies conducted in the US and Europe on marriage criteria have found that there are clear gender differences in people’s stated spousal preferences. Women often value men’s economic status and economic potential, while men pay more attention to women’s age and appearance (Shackelford et al. 2005; Greitemeyer 2007). Some studies find that men are also concerned about their potential partners’ socioeconomic status; for example, those who have no stable job, low income, and limited education — both men and women — are often in inferior positions in the marriage market (South 1991; Lloyd and South 1996; Dykstra 2004; Greitemeyer 2007). Generally, however, men’s socioeconomic status is more important to men’s ability to marry than women’s socioeconomic status is to women’s ability to marry. In China, men’s economic characteristics can determine their marital status: women are more likely to marry men with better occupations and higher socio-economic status, while men in poor socio-economic positions are more easily rejected in the marriage market (Zhang and Zhong 2005; Peng 2004). A calculation using China 1990 (1% sample) and 2000 Census (0.1% sample) also shows the effect of education on Chinese men’s marriage: for men in the birth cohort of 1956-1965, over 98% of male college graduates married by age 35 while the proportion of men with less than a primary school education who married was only 72% (Das Gupta et al. 2010).

Non-economic individual characteristics also have important effects on rural Chinese men’s
marriage. Being older, disabled, more introverted, or less articulate all make marriage for rural men less likely (Peng 2004; Ye and Lin 1998; Zhang and Zhong 2005). Age is an important factor in spouse selection process. Most first marriages occur before age 30 in China (Das Gupta et al. 2010). A study in Taiwan found that men who did not marry until their 40s or older, with wives from mainland China or Southeast Asian countries, and who usually belonged to vulnerable groups and were unable to marry at younger ages (Tsay 2004). The disabled always face more difficulties in finding a spouse, but due to the population sex-ratio imbalance, disabled men are at an even greater disadvantage than disabled women; the marriage rate of disabled men is far below that of both able-bodied men and disabled women (Kohrman 1999; Guo and Xie 2009). A study on inter-provincial female marriage migration also revealed that men who married women from poor provinces were mainly those whose poverty, older age, or disability prevented them from marrying local women (Davin 2005).

The importance of character traits in the spouse selection process has received less attention (e.g., Yan 2002; Peng 2004). Xia and Zhou (2003) found that young women in a north Chinese village placed more value on romantic love and shared aspirations after economic reform. Being extroverted and articulate are thought by young village women as essential traits in an ideal spouse. Those men who don’t know how to express their feelings have difficulty in the marriage market. Men who are not articulate and not sociable are looked down upon by women who think they are unable to adapt to a changing society and to have poor economic potential (Yan 2002; Peng 2004).

In exploring the effect of individual characteristics on men’s probability of first marriage, our second and third hypotheses are: (2) rural men with lower socio-economic status are less likely to marry; (3) rural men with less attractive individual non-economic characteristics are less likely to marry.
Family and community characteristics

Marriage is a major event for both the groom’s and the bride’s natal families. In rural China there is a long-standing cultural expectation that parents will help their son(s) get married, or face no support in old age and no worship as venerated ancestors after death (Wolf 1974; Wolf and Huang 1980; Gates 1996). However, since China’s economic reforms began in the early 1980’s, the expense of rural marriage for men, including a new house, bride price, and wedding ceremony, has risen dramatically; some calculations claim that in some villages the cost of a son’s marriage is usually eight to twenty times the annual income of a family (Han and Eades 1995; Wei and Zhang 2009). As a result, rearing a son is much more costly than rearing a daughter, and parents’ economic status and their ability to borrow large amounts of money have become very important in ensuring a son’s marriage. At the same time, it has become more difficult for a family with more than one son to pay for all sons’ marriages (Chu 2001; Zhang 2000). Most families can’t afford more than two sons’ marriages (Chu 2001) and the probability that all sons in such families will marry is relatively low. A quantitative study of the late 19th and early 20th centuries has found that factors such as family poverty and many sons often result in differentiation between brothers in their family’s contribution to financing a marriage (Wolf and Huang 1980).

In the Chinese tradition of virilocal marriage, where a woman marries into her husband’s household, marriage is a major opportunity for women, especially rural women, to escape poverty and improve their socio-economic status (Fan and Huang 1998; Davin 2007). So the condition of the prospective husband’s village is important in spouse selection process, and women usually move up to wealthier villages by marriage (Fan and Li 2002). For example, Laveley (1991) found that in Shifang County, Sichuan Province, in-marrying brides were always from low-income counties, whereas women marrying out of Shifang always moved to more prosperous areas. Thus, when women consider a potential husband, the economic status of the future husband’s community is of particular importance. From economic development, location in the mountains
or on the plains, transportation, communication conditions, and other differences between regions often influence an entire community’s capacity for young men to attract brides. Women from poor and remote mountainous areas often adopt a strategy of migrating to the plains to marry, while women from plain areas are unwilling to marry into mountainous areas (Liu 2005; Lu, 2006; Davin, 2007). This pattern inevitably leads to net transfer of the male marriage squeeze to poverty-stricken areas. Recent studies suggest that female marriage migrations all over the world — including rural-rural and rural-urban migrations in China, as well as international migrations — reflect rational economic decisions and show the widespread importance attached to geographic location and the local economy (Davin 2007). Hence, our fourth and fifth hypotheses are: (4) rural men from disadvantaged families are less likely to marry and (5) rural men from poor communities are less likely to marry.

We now investigate Chinese rural men’s probability of first marriage in terms of the five hypotheses proposed above.

Data

Data for this study came from a sample survey in four towns (zhen, which is an administrative unit below the county and above the village, not just one single small town/urban locale) in X County of Anhui Province in August 2008, conducted by the Institute of Population and Development Studies, Xi’an Jiaotong University. X County is located in eastern Anhui Province, near Jiangsu Province, and includes plain and mountains. The county is at a medium economic level and the rural per capita net income was 4,383 Yuan in 2007, slightly higher than the national average of 4,140 Yuan. Towns and villages in this county that are located on the plains were more developed than those in the mountains. Compared with local villagers’ incomes, the marriage costs here are very high. In 2006–2008, it cost a man in that county more than 100,000 Yuan to get married, of which 70–100,000 Yuan were spent to build a house and 30–50,000 Yuan to cover bride price, new furniture and appliances, and the wedding itself. On
the other hand, the sex ratio at birth (SRB) in X County was very high. The 2000 census data showed the SRB here was up to 130, seriously above normal (104-107). If this situation is not controlled in time there will be more “surplus” men – men who can’t marry although they want to. In the four towns covered in the survey, with a population of 187,188, the number of bachelors aged 28 and above totaled 1,757. Almost all of them are forced to be single; for example, the primary analysis of our data found that 96% of never-married men above 28 reported that they had experienced various difficulties in marrying, while the proportion of married men reporting difficulties marrying was only 37%. In sum, X County is a suitable site to examine the marriage squeeze and its consequences in rural China.

The objective of this survey was to explore who was being excluded from the marriage market, as well as what effects such exclusion has on the bachelors themselves, their families, and their communities. In addition to never-married and married men, we surveyed never-married and married women, some men’s and women’s parents or parents-in-law, and village cadres.

We used stratified random sampling to select respondents from three levels: town, village, and individual. Based on their geography and economic development, we selected four neighboring towns in X County. Two towns were on the plains and the other two were in the mountains. In every town, we selected nine or ten villages randomly, for a total of 38 villages. In every administrative village (which includes multiple natural villages), we selected the respondents from the sampling frames for never-married men aged 28 and above and married men and married women under 50. Because most young never-married men and women (those less than 28 years old) migrated out of the villages to work, we could not obtain a valid sampling

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2 The sampling frames for never married men aged 28 and older, and married men and married women under 50, respectively, provided by local government, including those who lived in villages, and those who migrated out of village for work. Because the latter ones could not be investigated during the survey, we only surveyed those who lived in their villages.
frame for them. Consequently, we included any young never-married man we found in the
homes of the never-married men aged 28 and older, married men, and married women we
surveyed. This procedure was also used to identify elderly parents to be respondents: when we
investigated never-married men aged 28 and above, married men, and married women, if at least
one of their parents or parents-in-law was alive and in good enough health to accept our survey,
he or she was asked to participate in the survey. Only one elderly parent was interviewed per
household. For never-married women, we used cluster sampling; we sampled five factories in W
Town (pseudonym), one of the plains towns where there were many township enterprises that
employed young people, especially unmarried men and women. As a supplement, we also
sampled one factory in which to survey young never-married male workers.

To ensure reliability, the data were collected through face-to-face interviews and each
investigator surveyed all of the respondents in the village to which he or she was assigned.
Interviewers were village family planning staff who had high school education or above, and
each was assigned a village with which he or she was familiar. Altogether 1,701 valid
questionnaires were collected. The subtotals for never-married men under 27, never-married men
aged 28 and above, married men under 50, never-married women, married women, elderly
parents, and village cadres numbered 77, 323, 265, 160, 256, 518, and 102, respectively.
Because the survey was organized with the support of local government authorities, the response
rate was close to 100%. Additionally, the Xi’an Jiaotong University research team trained
investigators in advance of the survey, supervised investigators during the survey, reviewed
questionnaires, and re-interviewed a 5% sample to ensure data quality. Preliminary analysis
suggests that the quality of data is quite reliable, with a consistency rate above 90% between
formal sample interviews and post-survey re-interviews, apart from some items concerning
attitudes (these were about 80% consistent).

In rural China, men’s age at first marriage has been increasing in recent years (Ru, Lu and
Li 2007), but 18 is still usually recognized as the critical age of manhood and most rural males
are considered marriageable from age 18 (see also Lloyd and South 1996; Liu, Larsen and Wyshak 2005). Although generally expected to marry before age 28, men occasionally marry as late as age 50, after which they are considered too old to father children and thus no longer marriageable (Dykstra 2004). On the other hand, over the past half-century, especially after the economic reforms and opening-up of Chinese society in the early 1980s, economy and culture have changed dramatically, and men above 50 today are distinctly different with respect to education, occupation, and so on from men under 50. For this reason we did not include men who were older than 50 in this study, restricting our sample to ages 18–50. We also excluded those never-married men who came from the factory. There were 436 men in this age range in our survey, but in order to ensure that all analyses were based on the same respondents, we removed 24 cases with missing values for any of the variables shown in Table 1, leaving a total sample of 412, of whom 161 were never married and 251 were married men.

Measures and method

Dependent Variables

In the survey, we asked respondents the date of their birth, their marital status, and the date of married men’s first marriage to make it easier to calculate the duration of their bachelorhood after 18 years of age. For the never-married, we do not know whether they will marry in the future or, if they do, when they will marry, so the data for them are “censored”. Therefore, we use event history analysis to analyze the effects of relevant factors on rural men’s probability of first marriage. The dependent variable is the duration of a rural man’s being never-married after 18 years of age, which terminates with the event of his first marriage. Thus 161 cases are censored.

Independent Variables

The independent variables concern the matchmaking network. In the survey, each
respondent was asked to answer “when you looked for a potential spouse, how many family members, relatives, neighbors, friends, or others, respectively, helped you?” First, we add the numbers together as the value for the variable “network size”. Then we divided the network ties into having a network (when the network size is positive) and no network (when the network size is equal to 0), with no network as reference. We also divide network members into kin and non-kin ties: the former were patrilateral family members and other relatives (e.g., matrilateral or affinal kin), and the latter includes neighbors, friends, and others. Thus we could measure the different types of ties, including no network, only kin ties, only non-kin ties, and both kin and non-kin ties, with no network as the reference.

Control Variables

Control variables include individual socio-economic variables, individual non-economic variables, family variables and community variables.

Individual socio-economic variables are measured by education and occupation. We asked the education level of respondents, coded as: “primary school and lower”, “middle school” and “high school and higher”, with “middle school” as the reference. For occupation, we asked the respondents to report “what is your occupation now?” and classified the responses into agricultural labor and non-agricultural labor, with non-agricultural labor as the reference. This measure may be slightly biased to reflect men’s occupation in their 20s relative to those who are older. Though people may change their occupations, the new ones usually still belong to agriculture or non-agriculture. We, therefore, regard it as acceptable to measure people’s social economic status before marriage.

Individual non-economic variables include age, age square, personality, and the presence of physical disability. Age is a continuous variable. Because the effect of age on the dependent variable may be non-linear, the square of age is also considered. Personality is measured simply; we asked the respondents to report “do you think you are extraverted?” In our analysis, we coded
the responses as extraverted (including “very extraverted”, “extraverted”), neutral, and introverted (including “introverted” and “very introverted”), with the first one as the reference. For the presence of physical disability, we asked respondents “do you have any physical disability”? The response is coded as “yes” and “no” with “no” as the reference.

Family characteristics include the family’s economic condition when the respondent was about 20 years old and the number of brothers (himself included). We asked “what was the economic situation of your parents when you were at about 20 years old?” The self-reports were coded as “medium and above” and “poor” with “medium and above” as reference. The number of brothers is treated as a continuous variable.

For community characteristics, there is a strong correlation between a village’s economic standing and its geographic location. Only geographic location is entered into our analysis. We coded it as dichotomous: plain and mountains, with plain as the reference.

Methods and models

We apply three event history analysis methods. First, a Kaplan-Meier survival analysis is used to estimate the duration of rural men’s bachelorhood (see Table 1). Second, a life table analysis is used to construct curves of the probability of first marriage for tie configurations of the matchmaking network. These curves allow us to compare the dynamics of network tie configurations and men’s probability and timing of first marriage. Finally, multivariate Cox hazard regression models are generated to analyze how the various factors affect the probability that rural men enter first marriage.

Three models are generated in this paper. Model 1 is designed to analyze the effects of individual socio-economic status, individual non-economic characteristics, and family and community characteristics, respectively, on the dependent variable. Models 2 to 3 are designed to analyze the effects of the matchmaking network, including gross effects of network and net effects after controlling for covariates. Model 2 explores the effect of having a matchmaking
network, and Model 3 explores whether various types of network ties have different effects on the basis of Model 2. The statistical information for dependent, independent, and control variables is listed in Table 1.

Table 1. Descriptive statistics (N=412)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of bachelorhood (Years)</td>
<td>15.11</td>
<td></td>
</tr>
<tr>
<td>Being married</td>
<td>.61</td>
<td>.489</td>
</tr>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matchmaking network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>1.44</td>
<td>2.067</td>
</tr>
<tr>
<td>Having a network</td>
<td>.62</td>
<td>.486</td>
</tr>
<tr>
<td>Only kin ties</td>
<td>.38</td>
<td>.486</td>
</tr>
<tr>
<td>Only non-kin ties</td>
<td>.13</td>
<td>.341</td>
</tr>
<tr>
<td>Both kin and non-kin ties</td>
<td>.11</td>
<td>.309</td>
</tr>
<tr>
<td><strong>Individual social-economic characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school and lower</td>
<td>.34</td>
<td>.475</td>
</tr>
<tr>
<td>High school and higher</td>
<td>.11</td>
<td>.315</td>
</tr>
<tr>
<td>Agricultural labor</td>
<td>.41</td>
<td>.494</td>
</tr>
<tr>
<td><strong>Individual non-economic characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>35.50</td>
<td>7.248</td>
</tr>
<tr>
<td>Age$^2$</td>
<td>1312.83</td>
<td>501.017</td>
</tr>
<tr>
<td>Neutral</td>
<td>.32</td>
<td>.466</td>
</tr>
<tr>
<td>Introverted</td>
<td>.44</td>
<td>.497</td>
</tr>
<tr>
<td>Physically disabled</td>
<td>.17</td>
<td>.378</td>
</tr>
<tr>
<td><strong>Family and community characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents with poor economic condition</td>
<td>.49</td>
<td>.500</td>
</tr>
<tr>
<td>Number of brothers</td>
<td>1.94</td>
<td>.838</td>
</tr>
<tr>
<td><strong>Community characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountains</td>
<td>.49</td>
<td>.501</td>
</tr>
</tbody>
</table>

From Table 1 we see that among the 412 men sampled, the proportions of never married and married men are 39% and 61%, respectively. The average period of bachelorhood of all men
(from 18 years old to age at marriage for married men or to 2008 for unmarried men) computed by Kaplan-Meier survival analysis is 15.11 years. The duration of bachelorthood for married men was 5.35 years, while the never-married men had, on average, been bachelors for 18.86 years, which means the average marriage age for the married men was more than 23 and the average age of the never-married men was almost 37 at the time of the survey. As to the independent variables, the average size of the matchmaking networks is not large (1.44) and the proportion who had a network is 62%. Among those having a network, the proportion of those with only kin ties is 38%, significantly higher than those with only non-kin ties (13%) and those with both kin and non-kin ties (11%). This indicates family members and relatives have been the main matchmakers in our sample.

Results

Network Tie Configuration and Men’s Age at First Marriage

A life table analysis was applied to analyze changes in the probability that men in our sample remained single with increasing age under different network tie configurations (Figures 1 and 2).
Figure 1. Having a matchmaking network before marrying and the probability of men’s remaining single

![Graph showing the probability of remaining single for men with and without matchmaking network connections over age]

Figure 2. Matchmaking network ties before marrying and the probability of men’s remaining single

![Graph showing the probability of remaining single for men with and without matchmaking network connections over age]
Figures 1 and 2 first show that, with increasing age, the probability of men remaining single decreases. Each curve can be roughly divided into three stages: from 18 to 21 years old, when the probability of remaining single decreases slowly, indicating that only a few rural Anhui men marry in this age group; from 22 to 27 years old the curves drop rapidly, indicating that these are the ages at which most men in our sample got married and at which the proportion of married men in the population increases rapidly; and after age 28, when the probability of remaining single decreases slowly again, and the curve of “no network” remains almost constant.

Second, the effects of different network tie configurations on the probability that a man in our sample gets married show significant differences. Figures 1 and 2 reveal that men with no network have the highest probability of remaining unmarried (about 60% at 28 years old, by which age the overwhelming majority of first marriages have already occurred), and most men with no network are effectively removed from the marriage market at an earlier age (by about 28); however, men with a network, no matter what kind of network ties, have a relatively lower chance of remaining single (less
than 30% at 28 years old), and they have a longer time period in which they have opportunities for a first marriage to occur, until their early 30s.

Third, Figure 2 also shows that among men with a network, there are some interesting findings for different network tie configurations. Before age 25, the curve of “kin ties” is the lowest, indicating kin ties play more important roles at the most common marriage ages than other network ties, but the difference seems not to be significant. After age of 25, the curve of “non-kin ties” is the lowest, showing that among this older age group, non-kin ties play a more important role in increasing men’s probability of marrying. Surprisingly, the curve of “both ties” is higher after age 20. In sum, having a matchmaking network does indeed increase the chance of first-marriage for men in our sample. Moreover, kin and non-kin ties contribute differently: at the primary ages for marriage (18-25), kin ties play a more important role, but at the later ages (over 25), non-kin ties are more important for a marriage to occur while the combined role of both ties is less important.

Thus, our analysis shows that having a matchmaking network has a significant effect on the duration and probability of bachelorhood for men in our sample. Different ties also have different effects. So far only the gross effect of the network tie configuration has been taken into account. After other factors are considered, does the matchmaking network play an important role in increasing rural men’s probability of first marriage, and are there markedly different effects of different ties on this probability? For more details we use multivariate regression.

Results of Multivariate Regression

A Cox Hazard regression method was applied to produce three models, the results for which are reported in Table 2. Model 1 is intended to estimate the effects of individual socio-economic status, individual non-economic characteristics, and family and community characteristics, on the probability of first marriage for men in our sample. Models 2 and 3 then estimate the effects of the matchmaking network on that probability.
Table 2. Cox regression of determinants of rural men’s risk of first marriage (N=412)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gross effect</td>
<td>Net effect</td>
<td>Gross effect</td>
</tr>
<tr>
<td><strong>Matchmaking network</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>.960 (.036)</td>
<td>.940 (.040)</td>
<td>.962 (.041)</td>
</tr>
<tr>
<td>Having a network</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only kin ties</td>
<td>2.651 (.168)**</td>
<td>2.225 (.174)***</td>
<td></td>
</tr>
<tr>
<td>Only non-kin ties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both kin and non-kin ties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Individual socio-economic</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school and lower</td>
<td>.354 (.161)***</td>
<td></td>
<td>.571 (.171)***</td>
</tr>
<tr>
<td>High school and higher</td>
<td>.798 (.202)</td>
<td></td>
<td>.811 (.210)</td>
</tr>
<tr>
<td>Agricultural labor</td>
<td>.743 (.134)*</td>
<td></td>
<td>.979 (.145)</td>
</tr>
<tr>
<td>Variable</td>
<td>M1</td>
<td>M2</td>
<td>M3</td>
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<tr>
<td>--------------------------------</td>
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<td>-------------</td>
</tr>
<tr>
<td></td>
<td>Gross effect</td>
<td>Net effect</td>
<td>Gross effect</td>
</tr>
<tr>
<td><strong>Individual non-economic characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.966 (.099)</td>
<td>.961 (.104)</td>
<td>.952 (.104)</td>
</tr>
<tr>
<td>Age$^2$</td>
<td>1.000 (.001)</td>
<td>1.001 (.001)</td>
<td>1.001 (.001)</td>
</tr>
<tr>
<td>Neutral</td>
<td>.654 (.149)**</td>
<td>.710 (.154)*</td>
<td>.707 (.155)*</td>
</tr>
<tr>
<td>Introverted</td>
<td>.392 (.178)***</td>
<td>.478 (.180)***</td>
<td>.472 (.181)***</td>
</tr>
<tr>
<td>Physically disabled</td>
<td>.237 (.264)***</td>
<td>.274 (.267)***</td>
<td>.273 (.268)***</td>
</tr>
<tr>
<td><strong>Family characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents with poor economic condition</td>
<td>.536 (.135)***</td>
<td>.698 (.149)*</td>
<td>.692 (.149)*</td>
</tr>
<tr>
<td>Number of brothers</td>
<td>.756 (.086)***</td>
<td>.783 (.090)***</td>
<td>.786 (.091)***</td>
</tr>
<tr>
<td><strong>Community characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountains</td>
<td>.666 (.129)***</td>
<td>.733 (.131)*</td>
<td>.725 (.132)*</td>
</tr>
<tr>
<td>-2LL</td>
<td>2765.517***</td>
<td>2726.494***</td>
<td>2783.423***</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>Notes: Numbers are relative risk ratios and standard errors; the latter are in parentheses.</td>
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<td></td>
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<tr>
<td>A relative risk ratio lower than 1 means a negative effect while a relative risk ratio higher than 1 means a positive effect.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>*p&lt; .05 **p&lt; .01 ***p&lt; .001</td>
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</tbody>
</table>
From Model 1, most non-matchmaking network factors have significant effects on the probability of rural men’s first marriage. In terms of individual socio-economic characteristics, education level and occupation have significant effects. Compared to men with middle school education level, men with an educational level of primary school or lower are less likely to get married. Compared with men in non-farming jobs, the probability of a first marriage for men working on farms is lower. Both the risk ratios and the model are significant, indicating individual socio-economic characteristics are important factors in rural Anhui men’s marital status.

As to individual non-economic characteristics, personality and disability have significant effects. Personality has a linear effect on the dependent variable. Compared with extroverted men, the probability of first marriage for neutral personalities is lower (65.4%), but that for introverted men is the lowest (39.1%). Relative to men who are not disabled, the probability of getting married for disabled men is greatly reduced.

Family and community factors, too, have significant effects. For men whose parents’ economic condition was poor when these men were around 20 years old, their probability of first marriage is only 53.6% of that for men whose parents’ economic condition was not poor. The number of brothers also has a significant negative effect: for any man, each increase in the number of his brothers will decrease the probability of first marriage by 24%. Living in mountainous areas greatly decreases men’s opportunity for a first marriage.

In Models 2 and 3, social network factors are entered to explore the gross effects of matchmaking network on the probability of rural Anhui men’s first marriage and the net effects after covariates are controlled. We find that the tie configuration, but not the size of the matchmaking network, has an important effect on the probability of men’s first marriage. From Model 2, in terms of gross effects, the probability of first marriage for men having a network is more than twice of that for men without a network. After covariates are controlled, the net effect
of network configuration is still significant, although the risk ratio changes somewhat.

In Model 3, in order to explore whether there are significant differences among different kinds of network ties, we divided “having a network” into three categories: only kin ties, only non-kin ties, and both kin and non-kin ties on the basis of Model 2. We find that all categories of network ties have positive and significant effects on the probability of men’s first marriage compared to having no network, which further confirms the results in Model 2. Moreover, we also find that among the three categories of network ties, the probability of a first marriage for men with only kin ties is slightly higher than that of men with the other two kinds of ties. This indicates kin ties still play a more important role in matchmaking. The probability of a first marriage for men with both kin and non-kin ties is still the lowest, which is unexpected. But the difference between all three is not much significant. Perhaps this just reflects the matchmaking strategy for some men who have difficulty in getting married. To families with available networks, when a man can’t get married at an appropriate age, his family may attempt to ask more people (including both relatives and non-relatives) for help to introduce him to unmarried women. This phenomenon may weaken the role of both ties, as well as partly explain why men with larger matchmaking networks are not always the most likely to marry. Thus among men who can’t get married smoothly, a majority have no network, but some may have different kinds of network.

Relative to Model 1, except for occupation, the significant levels of covariates are nearly unchanged, although some slight changes emerge for the risk ratios. For occupation, the strong correlation with education and disability explains this result, but the selection of respondents and the local economy in the survey site may also contribute. The survey was carried out in rural villages, so the respondents were engaged in agricultural production, or were hired by local enterprises, or had been running their own business within the county for a long time, while migrants who left the rural county for the urban county seat, or for other cities, were not covered in the survey. In addition, local cash crops and poultry farming can increase farmers’ income, so
the income level of people engaged in agricultural occupations in our sample may not be much lower than that of the non-agricultural workers. Because the birth rate has declined since the implementation of family planning in the late 1970s, there is also a strong correlation between age and number of brothers and when both of these variables are entered into the same model the effect of age may not be significant.

Discussion

Event history analysis has been applied to data collected in four towns in X County of Anhui Province in August 2008 to analyze determinants of rural men’s probability of first marriage. The analyses support most of our hypotheses except that occupation and age seem not to have significant effects. That is not to say they are not important determinants of rural men’s probability of first marriage. The strong correlations among occupation, education, and disability, and between age and the number of brothers can partly explain why occupation and age appear not to affect the dependent variable in our analysis, while the survey site and respondents selected can also account for the effect of occupation.

Our study site, X County, is a medium-developed rural county in central China, containing both plain and mountain areas. It is a good place to investigate the male marriage squeeze and its consequences in central China and possibly to differentiate the effect of geographical location between plain and mountainous areas. It provides an important comparison case because most studies on the male marriage squeeze in China focus on poverty-stricken, remote, and mountainous western China. Our investigation finds that men’s difficulties in marrying are not confined to such poor remote areas. Even in a rural area of central China, where the economy is reasonably developed, such as the medium-level site of our study, men face a marriage squeeze that makes it difficult for some of them to marry at the appropriate time, or even at all. Even some men in the plain areas of our study site faced difficulties in getting married, but the problem is more serious for men living in mountainous areas. Thus, the male marriage squeeze
exists in both western and central China and in both plain and mountainous areas.

This paper reveals the major factors behind rural men in this part of China becoming involuntary bachelors and what can facilitate rural men’s marriage. Age is an important determinant of men’s status in the marriage market, and age 27 is an important boundary for rural men’s marriage probability. Most men marry between the ages of 22 and 27. The probability of first marriage decreases sharply from age 28, and drops to almost zero when they are older than 34.

Matchmakers, who are men’s relatives or non-relatives, play an important role in increasing men’s chance of marrying. Those men who have no matchmaking network face a high risk of remaining single. Among men with a matchmaking network, different network configurations have slightly different effects on men’s probability of first marriage: men with only kin ties have a slightly higher probability of getting married, while men with both kin and non-kin ties have a slightly lower probability, although the difference is not significant.

Apart from the matchmaking network, other characteristics, such as having poor socio-economic status, an introverted personality, being disabled, having many brothers, and coming from a poor community, greatly increase the probability of remaining unmarried. This study suggests that marriage market theory can well explain which men are at competitive disadvantages in local marriage markets in rural China. Men with different individual characteristics and resources always have different probabilities of marriage. Those with lower socio-economic status and resources are more likely to be disadvantaged and to be excluded from marriage market.
Acknowledgements

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References

   Nanjing, China: Nanjing University Press. (In Chinese)


Coleman, J. S. (1988). Social capital in the creation of human capital, American Journal of 
   Sociology, 94 (1), 1-11.

Crowder, K. D., & Tolnay, S. E. (2000). A new marriage squeeze for black women: the role of 

   of market reforms. Indian Journal of Gender Studies, 12(2-3), 173-188.

   16 (50), 83-95.

   married in later life: Potentials, problems, and paradoxes” at the meeting of the 
   Gerontological Society of America, Washington D.C.

   Watson and Patricia Buckley Ebrey (Eds.), Marriage and inequality in Chinese society (pp. 


Fan, C. C., & Li. L. (2002). Marriage and migration in transitional China: a field study of 

   University Press.


Tsay, C. (2004). Marriage migration of women from China and Southeast Asia to Taiwan. In Gavin Jones and Kamalini Ramdas (Eds.), (Un)tying the Knot: Ideal and Reality in Asian Marriage (pp.173-191), Singapore: Asia Research Institute, National University of Singapore.


