Gender imbalance, involuntary bachelors and community security:

Evidence from a survey of hundreds of villages in rural China

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Abstract: The higher sex ratio at birth and the male marriage squeeze in China are receiving considerable attention. Scholars speculated that they might have a series of negative consequences for public safety, but there is little quantitative evidence. Using data from a survey of 364 villages in rural China, this study explores the challenge of gender imbalance to social order and safety at the village level. We found that gender imbalance had negative effects on the marriage market, community economy and order, and threatened communities' development and safety. Our findings confirm that the negative consequences of gender imbalance and the marriage squeeze are not just speculation, and effective policies are urgently needed to respond to and prevent negative consequences of gender imbalance.

Key words: gender imbalance; involuntary bachelors; community safety; marriage squeeze

Introduction

The sex ratio at birth (SRB) and female child mortality are key components of a population's gender structure. Since the 1980s, both the SRB and female child mortality have increased sharply in China under the combined effects of son preference, low fertility and sex-selective abortion. The SRB was 118.7 in 2005 and 118.06 in 2010 according to China's 1% national population survey in 2005, and the 2010 census data; in 2005 the sex ratios of male to female mortality at the ages of 0 and 1 were 0.80 and 0.84, respectively (Li et al. 2006). Data from China's 1% national population survey in 2005 show that the sex ratios in all age groups under the age of 20 are above the normal range, and the number of excess males under 20 has reached 33 million; many of these males will fail to find a wife in the next 20 years (Hesketh 2009; Zhu, Li and Hesketh 2009). The population sex ratios were above 105 in China's 1982, 1990, 2000 and 2010 censuses (Banister 2004; NBS 2011), while the normal range is 97.9 -100.3 (Coale 1991).

The potential consequences of gender imbalance are receiving increasing attention, and some, such as the marriage squeeze, and increasing rates of irregular marriages[1], are likely to become more serious in the future (Jin and Liu 2009; Li 2007). Census data, historical data and criminological studies have been used to predict that gender imbalance may have serious consequences for demography (e.g., population aging with the reduction of both population growth and labor force) , marriage, economy, health (e.g., expansion of the sex industry and HIV transmission) and public safety (e.g., increase of crime and antisocial behavior) (e.g., Cai and Lavely 2003; Das Gupta et al. 2010; Hudson and den Bore 2002; den Bore and Hudson 2004; Ebenstein and Jennings 2009). Referring to historical documents on the Nian Rebellion in the Qing Dynasty, it has been hypothesized that the excess males in China could threaten regional and even global security (Hesketh and Zhu 2006; Hesketh 2009; Hudson and den Bore 2002; den Bore and Hudson 2004).

Because of the higher SRB, the greater mortality of female infants, and the less developed economy in rural China, the consequences of gender imbalance are mainly experienced by the rural population (Das Gupta et al. 2010). However, among the massive number of rural-to-urban migrants, there are more men than women, and the majority of these men are young, poorly educated, and not married; the main aim of their migration is to search for work and to raise the financial capital required to afford a wife (den Bore and Hudson 2011). Thus, the consequences of gender imbalance will inevitably cross the boundary from rural areas into cities (Ebenstein and Jennings 2009; Tucker 2005).

Because the cohorts of excess males born in the 1980s have just reached the appropriate ages to marry and have children, most of the deleterious consequences of gender imbalance, especially those most destructive at the macro level, have not yet emerged. Therefore, most studies have been speculative, and there is a paucity of empirical evidence (Das Gupta et al. 2010; Hesketh 2009). This also means that most consequences of gender imbalance are represented as potential risks; it is not certain whether, when and in which forms they might occur, and what losses they would bring to the society. Fortunately, this uncertainty provides time and opportunity to mitigate potential problems in advance.

Evidence on security at the village level is an important tool for the government and society to recognize, explore and prevent potential social consequences of gender imbalance. Evidence of insecurity from villages can be considered as a manifestation of social problems and/ or conflicts at the village level; it is therefore an important signal that may presage larger-scale social instability. According to the Theory of Social Amplification of Risk, a potential or minor risk of instability may become exaggerated and elicit strong public reaction (Kasperson et al. 1998).

Due to a lack of quantitative data at the community level, the consequences of gender imbalance on community security have not been studied. In order to fill this data gap, the Institute for Population and development Studies in Xi'an Jiaotong University carried out a survey in 364

villages of 28 provinces in 2009, collecting village-level data on population, economy, marriage and community safety. This article is based on data collected in this survey, and explores gender structure, the marriage squeeze and characteristics of the unmarried men (involuntary bachelors) that result from the marriage squeeze, as well as perceptions of community safety in the surveyed villages. We focus on three issues: 1) the relationships among son preference, SRB, economic development level, population sex ratio and the marriage squeeze; 2) the effects that gender imbalance and the marriage squeeze have on the local marriage market; 3) involuntary bachelors' characteristics and the effects they have on their families and their villages.

The marriage squeeze and involuntary bachelors were a major focus of this survey. The reasons are the following: Most predicted consequences of gender imbalance are speculative, while the marriage squeeze is present and will exist for a long time. The male marriage squeeze and surplus males have been strongly emphasized in recent research, and are usually regarded as an important bridge between gender imbalance and its consequences for social stability. Especially in a society with a culture of universal marriage, the conflict between the strong demand for marriage and the shortage of marriageable women is likely to trigger a series of social problems that should be studied. Using data collected in Anhui Province, Liu and Jin (2011) find that most rural men get married between the ages of 22 and 27, and the probability of marrying deceases sharply after age 28. These authors also reported that 96% of never-married men above 28 had experienced difficulties in the process of finding a wife. Following Liu and Jin (2011), we define involuntary bachelors as those never-married men aged 28 and above.

The mainland provinces of China are commonly divided into three regions: the eastern region, which includes the 11 provinces of Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Zhejiang, Shanghai, Fujian, Guangdong and Hainan; the central region which includes the eight provinces of Heilongjiang, Jilin, Shanxi, Henan, Hubei, Jiangxi, Anhui, and Hunan, while the other 12 provinces belong to the western region (e.g., Gu et al. 2007). There are clear economic and demographic differences among these regions: eastern areas are the most developed, and

have the highest SRB; western provinces are the least developed, contain the majority of the poor, and have a relatively low SRB (Das Gupta 2010). Better economic conditions and more employment opportunities in eastern areas attract a large amount of labor from central and western areas (Wong 2007); at the same time, inter-provincial rural female marriage emigration also exhibits a trend from west to east. The largest numbers of female marriage immigrants are in eastern and central provinces, such as Hebei, Zhejiang, Jiangsu, Fujian, and Anhui (Fan and Huang, 1998; Min and Eades 1995; Davin 2007; Das Gupta et al. 2010). Economic and demographic regional disparities may have significant influences on the consequences of gender imbalance. For example, Das Gupta et al. (2010) predict that more men will remain single in the poorer inland and western provinces. The present study will explore regional similarities and differences in terms of gender imbalance, the marriage squeeze and security among eastern, central and western villages.

Recent research

Gender imbalance in China is not a new problem. Chinese history shows a male-biased sex ratio because of the prevalence of infanticide and higher mortality of female infants (Jiang 1997). Take the Qing dynasty and the Republic of China as examples. In the mid-Qing Dynasty, the population sex ratio was between 113 and 119 (Jiang 1993; Gao 2001); in Xuantong years (1909-1911), the national population sex ratio was 121.71, and the sex ratio in Beijing inner and outer city was up to 200.15 (Jiang 1997). The 1912 and 1928 national census data showed that the national sex ratios were 122.0 and 122.9, respectively (Tan 2002). China is not the only country with an unbalanced sex ratio; other Asian countries or regions, such as India, Pakistan, Bangladesh, Afghanistan, and Taiwan, also have many missing girls because of strong son preference; among these China and India have the largest numbers of both people and missing girls (e.g., Jha et al. 2011; den Boer and Hudson 2004; Guilmoto 2009). Between 1998 and 2001, the number of missing girls is estimated to have been more than 90 million in these six countries

or regions (den Boer and Hudson 2004). Asia has become the continent with the highest population sex ratio (Hesketh and Zhu 2006).

Demographic and economic implications

The shortage of females not only means that some female infants and children are deprived of the right to birth, but also the number of fertile women is decreased, causing a reduction in the size of the future population (Cai and Lavely 2003; Li 2007). The number of missing females reached 22 million just in the birth cohort of 1980-2000 (Ebenstein and Sharygin 2009). If the rate of missing girls continues at the level of 2000, the total population of China will be reduced by 13.6% at the end of the 21st century (Cai and Lavely 2003). It was reported that in a few poor and remote villages in Jilin and Gansu provinces, there had been no newborns for some years because of the shortage of marriageable women (Peng 2004; Lu 2006).

The falling fertility rate and the rising SRB will result in a declining labor supply and an increasing proportion of elderly in the population (Wang and Mason, 2004; Peng 2008). The Communiqué of the 6th National Population Census in China reported that the ratio of people aged 60 and older, which was 10.3% in 2000, increased to 13.3% in 2010 (NBS 2011). According to United Nations' projections, the ratio of the number of people aged 65 and older in China will increase from 8.2% in 2010 to 12.0 % in 2020, and to 16.5% in 2030 ,while both the number and the fraction of people aged 15-64 will begin to decline from 2020 (UN 2010). Aging of the population means that a smaller working-age population must support more old people, which will hinder economic development (Peng 2006). Furthermore, the elderly gradually lose production capacity, and become pure consumers; their demands for health care, social insurance and family support will also increase further (Bloom et al. 2010; Zeng et al. 2002).

The male surplus in the marriage market often results in enormous economic pressure on families. The shortage of marriageable women leads to an increase in marriage expenses for men, and families with sons must face heavy financial burdens. Since the 1980s, rural men's marriage expenses, including a new house, new furniture, bride price, and wedding, have increased rapidly.

In some villages, the cost of a son's marriage is 8-20 times the annual household income (Min and Eades 1995; Wei and Zhang 2009). Many rural households arrange a marriage for their son by borrowing money, and families with more than one son are often in debt (e.g., Lu 2006; Peng 2004)

Increasing household savings is an important strategy for families with at least one son to improve their sons' competitiveness in future marriage markets. The sex ratio can explain 68% of the increase in saving rates for rural households in China (Wei and Zhang 2009). A study of household savings in India came to a similar conclusion: in order to increase their sons' possibility of marrying, parents have to save more in advance (Chiu et al. 2010).

Marriage and women's security

In China, marriage is regarded as universal, and being married is a symbol of social status and acceptance, and the continuation of the family line (Hesketh 2009). According to a calculation by Davin (2007) based on China's 1990 and 2000 census data, the marriage rate was over 95% for both men and women who reach their late 30s. In 2002, the marriage rates for men and women aged 30-34 were 94.1% and 98.7%, respectively, based on the national rural household survey data from the 2002 Chinese Household Income Project (Meng 2009).

Paradoxically, the SRB in China has increased almost continuously since the early 1980s, which means that an increasing number of men face the risk of being forced to remain single. The marriage squeeze, an important consequence of gender imbalance, has emerged in some parts of rural China. The number of reported "bachelor villages" (a name given by some news agencies to villages with a high percentage of involuntary bachelors) is increasing in some remote rural areas (Jin and Liu, 2009). Furthermore, unmarried men outnumber unmarried women in every province (Davin 2007).

Large cohorts of surplus young men are only now reaching reproductive age, and the marriage squeeze is just beginning. In the next 20 years, when the cohorts born between the 1990s and 2010s reach marriageable age, the number of surplus males in the marriage market will

be larger, and the marriage squeeze will be more serious. Hudson and den Bore (2002) estimate that by 2020 there will be 29-33 million surplus men aged 15-34 who are unable to find a wife. If the rise in the SRB cannot be reversed and rapidly returned to normal, the male marriage squeeze will last longer. As Hesketh (2009) remarks, although there is nothing that can realistically be done in the short term to reduce the current excess of young males, much can be done to benefit the next generation.

Men's desire for marriage is likely to cause an increase in irregular marriages such as child marriage, exchange marriage, marriage fraud and mercenary marriage. In Chinese history, the shortage of women often stimulated adoption of various alternative forms of marriage, such as renting a wife, levirate marriage, exchange marriage, and child marriage (e.g., Sommer 2000; Wang 2000; Wolf and Huang 1980; Guo 2003). Historically, although such marriages did increase some men's marriage opportunities, women were often treated as tradable commodities, and their rights were not protected (Liu et al. 2009). A concern is that forced polyandry and the rise of trafficking in women will be inevitable (e.g., Bose 2001; Shanthi 2004; Sharma 2008). Additionally, there are increasing reports of marriage fraud where women pretend to marry men who are eager for marriage, and then disappear or run away after cheating the man and his family out of their money.

The few studies claiming that the deficit of women would improve women's status (e.g., Hesketh and Zhu 2006) have received much criticism. Most studies find that this is only an increase in women's marriage value, but not their status; men's demand for marriage and sex often stimulates crimes against women, such as abduction, rape, forced marriage and enslavement (Hudson and den Bore 2002; Banister 2004). In an analysis of 111 news reports on never-married men, Jin and Liu (2009) found that the prevalence of unmarried men indeed increases irregular or illegal behaviors relevant to marriage and sex, such as mercenary marriage, extramarital affairs, commercial sex and sexual assault.

Health implications

In a society with strong son preference, women are largely regarded as breeding machines. Some pregnant women undergo ultrasonic sex determination and sex-selective abortion, which may harm their health (Mo 2005; Li 2007). In Nepal, sex-selective abortion is an important cause of maternal deaths (e.g., Lamichhane 2011). The sex of her children often determines a woman's status in her home and what care she gets before and after a birth; women with unapproved pregnancies have a significantly lower chance of receiving prenatal examinations and being relieved of heavy physical work, and are less likely to give birth under aseptic conditions; in addition they are likely to receive poor nutrition and home care (Li 2004). Additionally, unwanted girl fetuses are very often aborted, and girl children face poor nutrition, and higher risk of death or poor health. The selective abortion of female fetuses has increased for families with a firstborn girl in both China and India (e.g., Ebenstein 2010; Jha et al. 2011). In India or Pakistan, a girl aged 0-5 faces a 30-50% higher chance of dying than a boy (Filmer, King and Pritchett 1998).

Their single status may affect unmarried men's mental and physical health (Li 2007; Festini and Martino 2004). Compared with married men, unmarried men often face heavy pressures; due to the lack of emotional support from a wife or a family, the rates of alcoholism, schizophrenia and suicide for the unmarried are significantly higher than for the married (Coombs 1991). Those men who are unable to marry are often scorned, are under great psychological pressure and sometimes may become alcoholic or resort to such extreme behaviors as self-mutilation and suicide (Li and Li 2008; Mo 2005). Because of the shortage of fixed partners and lack of related sexual knowledge, the likelihood of both buying sex and having unprotected sex are higher for poor young unmarried men who are then at a higher risk of contracting sexually transmitted diseases (Ebenstein and Jennings 2009; Tucker 2005). Chen et al. (2007) report that the odds ratio of being HIV positive for single individuals is 1.7 times that for married men; and 1.4 times higher for males than for women. In the last 10 years, the number of new HIV infections has increased rapidly, and sexual contact with infected partners (including via

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commercial sex, heterosexual and homosexual sex) is becoming the usual mode of transmission (Ebenstein and Jennings 2009). The vast numbers of young and single rural-urban male migrants may also exacerbate the spread of HIV between rural and urban areas (Ebenstein and Jennings 2009; Tucker et al. 2005).

Social stability

Compared to the high expense involved in obtaining a wife, it is easier for young, poor single men to afford commercial sex. Using the China Health and Family Life Survey, Ebenstein and Jennings (2009) found that 14.7% of single men admitted having paid for sex in 2000, while the proportion among married men was only 7.3%. The increasing shortage of marriageable women may increase the number of sex workers. It is estimated that the number of women whose primary income is from commercial sex may be from 1 million to 8 or 10 million (Fan 2007). Some studies confirm the relationship between the sex ratio, trafficking of women and the commercial sex industry. For instance, Zhao (2003) found that trafficking of women was increasing in China, which has a link with the rising sex ratio, and these trafficked women were often forced into prostitution or marriage. From cases reported in newspapers, Jin and Liu (2009) found that single men were more likely to interfere with others' marriages, or conduct sexual assaults, which can affect women's safety and damage family stability.

In addition to these behaviors related to extramarital sex, gender imbalance may increase crime rates. Crime, especially violent crime, is significantly correlated with gender and marital status. Violent crime is often carried out by single men who are young and poor (den Bore and Hudson, 2004; Messner and Sampson 1991). Disadvantaged young men are at greater risk for antisocial behavior, while marriage can make them responsible to their family and society (den Bore and Hudson 2011). Among the determinants of crime in China and India, the rising sex ratio may be an important factor; using annual province-level data between 1988 and 2004 in China, Edlund et al. (2007) estimated the increasing adult male population accounted for about one sixth of the overall rise in violent and property crimes. The authors also reported that this rising crime

rate was not due to more men, but to more single men. Studies by both Oldenburg (1992) and Dreze and Khera (2000) in India also found that regions with lower female-male ratios often had higher murder rates. In some studies male rural-urban migrants, of whom many are young single men, are reported as partly responsible for the rising crime rates in cities (e.g., den Boer and Hudson 2011; Hesketh 2009).

Although there is no current evidence that bachelors threaten society stability, the relationship between surplus men and security has received considerable attention. Studies of the Qing Dynasty have found that some illegal organizations and gangs, such as the Heaven and Earth Society, the Small Swords Society, Nian Army in North China, and *Luohanjiao* in Taiwan, of which bachelors were the main members, often engaged in rebellion, theft, robbery, and other criminal activities, and some even threatened the Qing government (Hudson and den Boer 2002; Zhou and Shao, 1993; Chang 2006; Tan 2002; den Boer and Hudson 2011). Referring to historical documents, den Bore and Hudson (2004) further found that poor bachelors would join together, and conduct crimes and participate in violence to improve their financial status. This view has begun to cause widespread concern, and led to heated discussion on the effect of the projected excess males in China and India on regional and even global security.

Data

The survey

In order to provide quantitative evidence of the relationship between gender imbalance, and the male marriage squeeze and their consequences at the village level, the Institute for Population and development in Xi'an Jiaotong University carried out a "Hundreds of Villages Survey" of 364 villages in 28 provinces during the summer vacation of 2009.

Village cadres are our respondents. They were asked to fill out a questionnaire to provide basic information for their villages, which included information about society, economy, population, marriage, involuntary bachelors' behaviors and community safety in villages. They

also filled out a registration form for involuntary bachelors, which included the name, age, and whether he was disabled for each never-married man aged 28 and older (those who had migrated out for work were also included) in their villages.

In order to cover more provinces or regions, and to explore the regional distribution of gender imbalance and the marriage squeeze in rural China, we recruited undergraduates coming from rural villages as investigators, and took advantage of the summer vacation, when most students returned to their home towns, to carry out this survey. There are many advantages to using undergraduates as investigators. First, their higher education allows them to understand and express the survey contents well, which helps to improve the data quality. Second, because they come from the villages, they are better acquainted with their village situation, and can more easily win the trust of village cadres and collect reliable data. Finally, they often come from widely separated villages, and most of them return to their hometown during the summer vacation, both of which allow us to investigate more villages. If each student were to investigate only his or her village, the number of investigators would be equal to the number of the surveyed villages.

We carried out the survey by recruiting freshmen or sophomores in four universities (three in Shaanxi Province and one in Shanxi Province) who came from rural villages. The higher proportion of rural students and good cooperative relationships with these universities are the main reasons that we chose these investigators. We recruited investigators according to the following criteria: first, they had to come from the countryside, have rural household registration (*Hukou*), and their family members still had to be living in villages during the survey. Second, they had to be freshmen or sophomores because school work for students in these two years is less arduous than for the more senior students, and they do not face the pressure of preparing for the postgraduate exam or looking for a job. Thus their probability of returning to their home villages is higher, which is helpful in increasing the response rate and improving the data quality. Third, each student would only investigate his or her home village, with only one investigator for each village. Finally, because a high proportion of students in these universities came from

Shaanxi and Shanxi provinces, we attempted to limit the number of investigators from these two provinces. In total 421 volunteers registered; this meant, in principle, 421 villages could be surveyed.

The survey was carried out from June 15 to August 30, 2009. We surveyed 371 villages from 28 provinces of mainland China (excluding Beijing, Guangdong and Tibet), and the response rate was 88.1% (i.e., (371/421) ×100% = 88.1%). There are two main reasons for missing questionnaires: one is that some students changed their schedule and did not go to their home villages; the other is that some students had difficulty in dealing with their village cadres. We took many measures to ensure data quality during the survey; these included training investigators and simulating the investigations in advance of the survey, guiding investigators and answering their questions through telephone and text messages during the survey, reviewing the questionnaires and asking investigators to explain or call back to fill in missing data from returned questionnaires. We also carried out logistical tests to ensure the quality of data entry. We obtained 364 effective samples, of which 94 and 105, respectively, were from Shanxi and Shannxi provinces (This is somewhat greater than the 50% maximum we had hoped for these two provinces; Table 1 shows the provincial distribution of the surveyed villages).

Clearly our sample is biased, and information on bachelors' behavior and community safety is not directly provided by involuntary bachelors themselves, but perceived and reported by village cadres. Nevertheless, our focuses are filling the data gap, and providing quantitative evidence of gender imbalance, the marriage squeeze and relevant security matters at the village level. Meanwhile, village cadres have the absolute authority in their village's matters in rural China; they always know what is happening in their village, and are mediators to deal with disputes. So they are more likely to provide reliable information on both their villages and villagers. Thus we believe that this study can provides a useful preliminary description of the basic characteristics of gender imbalance, the marriage squeeze and relevant security matters.

Another limitation is that we did not get information on how many never-married men aged 28 and older had migrated out of their villages, and who they were. Thus we could not directly judge the effect of migration on the number of never-married men, and whether they were forced to be single. Fortunately we could get indirect evidence from a subsequent individual survey carried out during the Spring Festival of 2010 with the never-married men aged 28 and older collected in the Hundreds of Villages Survey as the sampling frame; we found that 85 percent of the never-married male respondents aged 28 and older, including rural-urban migrants who had returned to their hometowns for Spring Festival, were involuntarily single.[2] Thus it is a reasonable assumption that most never-married men aged 28 and older were involuntary bachelors.

Table 1 here

Basic characteristics of the surveyed villages

Table 2 presents the basic demographic, labor migration, terrain and economic information of the surveyed villages. There are about five natural villages in each administrative village. The average population and number of households in a village are 2118.7 and 506.0, respectively. It is clear that the population size of western villages is larger, namely 2279.7 with 511.0 households. Labor emigration is a common phenomenon, and 423.3 laborers had migrated out of their town (*zhen*, which is an administrative unit below the county and above the village, not just one single small town/urban locale) in each village, i.e., 0.9 members per household had emigrated for work. The number of male emigrants is larger than that of females. There is also a significant regional difference in the number of rural migrants: on average 505 workers migrated out for work in each western village, which is 138.1 and 204.2 larger than those from central and eastern villages, respectively; 1.0 laborers per household migrated out, which is 0.2 and 0.3 greater than from central and eastern villages, respectively. Thus western and central rural areas are the main labor-sending areas, which is consistent with migrants' regional distribution at the national level.

Table 2 here

Table 2 also shows that the eastern villages are mainly in plains, and hills or valley, central villages are evenly distributed among plains, hills or valley, and mountains or plateaus, and western villages are mainly in mountains or plateaus. The average per capita income of the surveyed villages in 2008 was 3,571.0 Yuan, which is lower than the national average income of 4,761 Yuan in 2008. The income differentials from the national level may be due to a higher proportion of villages from less developed central and western China. The regional difference in income is also shown in Table 2: per capita income in eastern villages was nearly 6,000 Yuan, which is far higher than that in both central and western villages. Although the per capita income in western villages is slightly higher than that in central villages, this may be due to a sampling bias. The average income in central villages is underestimated while it is overestimated in western villages in this survey: more surveyed central villages were in Shanxi Province which was one of the less developed central regions, while more western villages were from Shaanxi province (one of the more developed western provinces), and fewer western villages were in the least developed provinces such as Yunnan, Gansu and Qinghai.

Son preference and the SRB

Table 3 presents data concerning gender preference in the surveyed villages. In a majority of villages (69.1%), most villagers still think each family should have at least a son, and this proportion is higher in western villages than that in both eastern and central villages. In recent years, most villages have seen a declining number of newborns; the main reasons are higher costs of feeding children and the strict family planning policy. In only about 19.9% villages, was it viewed the same to have a son or a daughter. There is a regional difference in son preference, and the fraction of villages with son preference is higher in the less-developed western villages where agriculture is the main livelihood.

Table 3 here

The SRB of the surveyed villages in 2008 is also shown in Table 3. On average, there were 31.2 new babies born in each village, including 17.1 boys and 14.1 girls. The SRB was 121.5, which was close to the national level in 2008 (namely 120.6). The average SRB in eastern villages was the highest (131.1), and in western villages it was the lowest (115.1), which is consistent with the national distribution. Thus our data reflect the national trend.

The high SRB is a reflection of son preference in fertility behavior; in areas where son preference is stronger, the SRB is higher. But as shown in Table 3, compared with western and central villages, eastern villages have a higher SRB as well as weaker son preference. This apparently contradictory result may reflect the effect of different family planning policies in different areas on villagers' fertility behavior. Generally, in areas with strong son preference, the low fertility impels couples to carry out sex-selective abortion in order to increase the chance of having a son (Banister 2004). In contemporary China, the one-child policy is strictly implemented in eastern China, and many families do not have the opportunity to have a son by having more children, so parents are highly motivated to prevent the birth of daughters, which leads to the extremely biased SRB in eastern China (Gu et al. 2007). We also present fertility information in Table 3. Clearly there is a higher percentage of one-child families in eastern villages, and most one-child families are one-son families in all regions, reflecting the combined effect of son preference and regional disparities in the family planning policy.

Population sex ratio and marriage squeeze

Table 4 shows the population sex ratio and the number of involuntary bachelors in each village. The average population sex ratio is 112.6, far above the normal level. Thus in rural China, the sustained high SRB and higher female child mortality since the 1980's have caused the population gender structure to deviate from normal. There is an inconsistency between the regional distributions of the SRB (shown in Table 3) and population sex ratio (shown in Table 4). The population sex ratio in eastern villages is about 105.5, slightly higher than the normal range

of 97.9-100.3 (Coale 1991), while the SRB is the highest. On the contrary, there is a higher population sex ratio and a relatively lower SRB in western and central villages.

A male-biased sex ratio makes the marriage squeeze inevitable. Table 4 reveals the number of involuntary bachelors in each village. There are 3268 involuntary bachelors in the 362 surveyed villages. The average numbers per village and per hundred households in each village are 9.0 and 2.7, respectively. There are more bachelors in western villages: 10.3 bachelors per village, and 3.2 bachelors per hundred households in each village. Based on the number of involuntary bachelors per hundred households, we divide the surveyed villages into high-bachelor-ratio villages (those with three or more involuntary bachelors per hundred households), and low-bachelor-ratio villages (those with less than three involuntary bachelors per hundred households). About 28 percent of villages have the higher ratio, and the proportion in western villages is the highest (30.7%).

Economic, demographic and geographical factors are correlated with the number of involuntary bachelors per hundred households (see Table 5). The greater the income per capita, the fewer involuntary bachelors, while the number of female labor out-migrants, distance form county seat, and distance from town seat are all positively correlated with the number of involuntary bachelors per hundred households. Our data also indicated that the number of bachelors per hundred households is highly correlated with topography. In mountain or plateau villages, the number of involuntary bachelors per hundred households is 3.9, higher than that in both plains villages, and hills or valley villages (which are 2.0 and 2.1, respectively).[3] This reinforces our finding that remoteness of a village and difficulty of conditions lead to female migration and an increased marriage squeeze. On the other hand, the number of male labor out-migrants does not correlate significantly with the number of bachelors per hundred households.

Table 6 reports the marriage squeeze according to village cadres' assessment of the degree of men's difficulty in getting married in their own villages. In nearly half the villages, some male villagers have difficulty in finding a wife. Thus in contemporary rural China, it is becoming common that some men are unable to marry; in both less developed western and central areas, and more developed eastern areas, some villages are facing a male marriage squeeze. There is also a parallel between the number of involuntary bachelors and the degree of difficulty in marrying: the more involuntary bachelors above age 28 in a village, the more difficult it is for men to find a wife. Western rural villages have more involuntary bachelors and a more serious marriage squeeze.

Table 6 here

Tables 3, 4 and 6 also show the relations between SRB, population sex ratio and marriage squeeze: the population sex ratio is not always consistent with the SRB, while the extent of the marriage squeeze is consistent with the population sex ratio. The key factors behind these differences are unbalanced regional economic development and the trend in female marriage migration. Due to a surplus of males, female's marriage value is raised, and females can marry up. In China, the wealthy economy in eastern areas attracts more women from western and central villages, and female marriage migration shows a trend of rural-to-rural migration from the less developed west to the more developed east (Davin 2007). As shown in Table 9, between 2006 and 2008, there were 24.2 out-of-county wives on average in each village; compared with central and western villages, there are more out-of-county wives in eastern villages (about 35.4 nonlocal wives per village), although the average population is smaller. This female marriage immigration makes up for the shortage of marriageable women, brings the gender structure closer to normal, and relieves the marriage squeeze in receiving areas. Besides the SRB, migration is also a key factor in determining the population gender structure, and long-distance female marriage migration relieves the shortage of women in receiving areas, while making it worse in sending

areas. Thus areas with a high SRB may not have a skewed population sex ratio or face a more serious marriage squeeze.

Table 6 also provides some evidence as to the reasons for the marriage squeeze reported by village cadres. More males born in the same birth cohort, a community's poor economy, more local women's emigration and high marriage expenses are important factors preventing rural men from marrying in western areas, while only high marriage expense is reported as the major problem in eastern villages. Thus their poor economy forces western villages to face the problem of more women migrating out and less women marrying in, producing a serious shortage of marriageable women, and the problem of more males in the same cohort is exacerbated. On the contrary, in eastern villages, the richer economy and employment opportunities attract more women for marriage, so the shortage of marriageable women is not so great. The key factor for men's failure to marry is their family's poverty; they cannot afford the high marriage expense.

Table 7 presents information of involuntary bachelors' age and physical health. Most involuntary bachelors are still relatively young; their average age is 41.4, about 18 percent are aged 28-30, about 38 percent are aged 31-40, and about 24 percent are aged 41-50. If men under 50 are regarded as marriageable, the overwhelming majority of bachelors are still of marriageable age.[4] Even regarding forty as the maximum marriageable age, still more than a half are marriageable. From the regional distribution, the younger age of bachelors in western villages is clear. Their average age is only 39.9 and the percent of bachelors under 40 is higher. The proportion of involuntary bachelors aged 28-30, who were born in the late 1970s or early 1980s when the family planning policy began to be carried out and the SRB began to rise, also deserves attention. Among all of the involuntary bachelors, 18 percent are in the age group 28-30, and this proportion in western China is significantly higher than in eastern areas, which means the surplus males born since the 1980s are already affecting the marriage market, particularly in less-developed areas. We can predict that in future, along with more surplus boys becoming adults and entering the marriage market, the trend toward younger involuntary bachelors will become more

evident. Furthermore, younger single men have a stronger demand for marriage and sex, and are more likely to cause trouble (Hudson and den Bore 2002; Edlund et al. 2007), which may become a potential threat to social stability.

<center>*Table 7 here*</center>

As shown in Table 7, 20.1 percent of bachelors are disabled, which is far higher than the national level[5]; health status is an important factor in men's failure to marry. Compared to non-disabled men, disabled men face a higher risk of being forced to be single. After controlling other variables, Liu and Jin (2011) find the probability of marrying for disabled men is only 20 percent of that of their non-disabled counterparts. In western and central villages, about 19 percent of male bachelors are disabled, which is obviously lower than in eastern villages, and implies that the marriage squeeze is more serious in central and western rural areas, where more healthy men have difficulties in marrying.

Marriage market

Increasing marriage expense

Information on marriage expenses is shown in Table 8. The average marriage expense for men is 95,058 Yuan, which is 3.5 times that of women's marriage expense (see Table 8), and 26.6 times as much as per capita income in 2008. It should be emphasized that women's marriage expense is mostly in the form of dowry, which is often called "indirect bride price" in rural areas because it often wholly or partly comes from the bride price offered by the groom's family (Yan 1996). Thus males absorb most of the marriage expenses and to families with sons, making a marriage is a heavy economic burden.

<center>*Table 8 here*</center>

Table 8 shows that marriage expenses for both men and women in central villages are the highest (115.4 thousand and 40.3 thousand Yuan), while the marriage expense ratios (i.e., for males relative to females) for eastern and western villages are higher (4.9 and 4.3, respectively).

In villages with a high bachelor ratio, although the average marriage expense for men or women is far lower than that in low-bachelor- ratio villages, the marriage expense ratio is higher (5.1). These differences among regions and bachelors' ratios reveal two features of marriage expenses in the context of marriage squeeze: first, villages with a higher ratio of bachelors are often less developed, so the absolute marriage expense is usually relatively low; second, marriage expense is a very competitive resource for marriageable men, and it is not surprising that the more serious the marriage squeeze, the more men's and women's marriage expenses differ.

Nonlocal brides from remote areas

Table 9 presents information about nonlocal wives from other counties, cities or provinces between 2006 and 2008. In more than half of the surveyed villages (i.e., 202 villages in total), there are nonlocal wives from poorer counties or provinces, and the payment to brokers for introducing a nonlocal wife is up to 5,000 Yuan. Brokers in eastern villages can charge more, and about half of them can obtain more than 1,000 Yuan, while in central and western areas about sixty percent of them make less than 1,000 Yuan. Compared with low-bachelor-ratio villages, brokers can earn more in villages with a high ratio of bachelors: in more than half of the latter villages, brokers can charge more than 1,000 Yuan, and the proportion without charge is also far lower. Thus the greater the shortage of marriageable women, the stronger the demand for marriageable women, and the more likely it is that male villagers will pay more to brokers in order to obtain a marrying opportunity.

Table 9 here

It is not rare that nonlocal wives run away. Between 2006 and 2008, cases of nonlocal wives' running away occurred in about 40 percent of villages with nonlocal wives, and on average there were 2.9 cases in these villages. Nonlocal wives ran away more frequently in villages with a more serious marriage squeeze, such as western villages or high-bachelor-ratio villages. A higher frequency of nonlocal wives' running away may reflect greater instability of nonlocal marriages and could involve some form of marriage irregularity. On the one hand, some

nonlocal women may be forced to marry at a certain price by their family members or criminals. In such cases, they will look for opportunities to run away if they are not satisfied with their marriage. On the other hand, some runaway wives are actually marriage cheaters. Men's strong demand for nonlocal women is easily exploited by marriage cheaters; some women pretend to marry local men, then disappear after taking the bride price. We also provide information on marriage fraud (see Table 10). In sum, the normal marriage order faces the risk of being commercialized and distorted because of gender imbalance; in poor areas and those with a serious marriage squeeze, these problems are worse.

Marriage fraud

Table 10 reports involuntary bachelors' experience of marriage fraud. In about twenty-eight percent of the surveyed villages, there were cases of marriage fraud against involuntary bachelors between 2006 and 2008. The percentages in eastern, central and western villages are very close, but significantly higher in high-bachelor-ratio villages than in low- bachelor-ratio ones. Involuntary bachelors' strong desire for marriage places them at high risk of marriage fraud, and the occurrence of marriage fraud is higher in villages with a more serious marriage squeeze. Involuntary bachelors and their families often suffer serious financial loss because of being cheated. In most villages with cases of marriage fraud, most victims are cheated out of more than 3,000 Yuan, and in 26.8% of villages, the amount of money taken is even more than 10,000 Yuan. A higher proportion of involuntary bachelors are cheated out of more money in eastern and central areas.

Table10 here

Involuntary bachelors and community security

The effect of being single on involuntary bachelors and their families

Table 11 reveals the effects of being single on involuntary bachelors and their families. In nearly half of the surveyed villages (48.2%), involuntary bachelors are discriminated against to

some extent. In western or high-bachelor-ratio villages, in both of which there is a more serious marriage squeeze, the proportion who suffer discrimination is slightly higher than in other villages.

Table 11 here

Being single is also more likely to affect involuntary bachelors' families: in only 9.1% of villages, is there no effect of being single on their families. The main effect of remaining a bachelor on their families is psychological. This may be due to the culture of universal marriage and parents' important role in arranging a marriage for their children. 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 after death (Wolf 1974; Wolf and Huang 1980; Gates 1996). Thus it is parents' responsibility and fault if their son(s) cannot get married. In nearly half of the villages, the presence of involuntary bachelors affects their family relationships and economy. Although our survey offers no detailed data on the causes, using qualitative data from YC County in Henan Province, Wei et al. (2008) found that involuntary bachelors could not get along well with others (including their siblings); their parents did their best, such as building a new house, and raising more money, to increase their son's opportunity to get married. However, these measures may be deleterious to the family's economic situation, and damage other children's interests. Other Chinese studies have claimed that involuntary bachelors manifest negative attitudes towards life, and they spend too easily and lack motivation for work (Mo 2005; Liu 2005).

In sum, in rural China both involuntary bachelors and their families are vulnerable. It is a social disgrace for a family to have a son who does not marry at a timely age. Not only is an involuntary bachelor unable to shift his role from a son to a husband or a father, but his family also suffers discrimination, psychological pain and financial loss.

Involuntary bachelors' behaviors

In the survey, we asked the village cadres to assess "whether most involuntary bachelors' behavior is different from that of married men in your village". In nearly half of the surveyed villages, cadres responded "yes"; and in western or high-bachelor-ratio villages, the fraction was higher (see Table 12). Although we have no data on married men's behavior, we can indirectly compare involuntary bachelors' behaviors and their effects on community security with married men by dividing villages into "villages where most bachelors' behaviors are obviously different from married men's" and "villages where there is no obvious difference in behaviors between the bachelors and married men". The regional distribution and the ratio-of-bachelors distribution are used to explore the effects of different degrees of marriage squeeze.

Table 12 here

We listed some positive and negative individual behaviors, and asked village cadres to assess them based on most bachelors' behaviors in their villages. We also asked whether group security incidents, such as group fighting, making trouble as a group, and group stealing, had occurred between 2006 and 2008 in their villages (see Table 13). Table 13 shows that the proportion of villages where involuntary bachelors are classified as being irritable, loafing, and gambling is higher (31.8%, 45.6% and 35.6%, respectively); in some villages, involuntary bachelors are claimed to harass women, destroy others' marriages, or buy sex (5.0%, 4.7% and 6.7%, respectively). Compared with individual negative behaviors, the occurrence of group security incidents is relatively low and the proportions of villages that have experienced group fighting, making trouble as a group, and group stealing are 7.8%, 10.6%, and 8.4%, respectively.

Table13 here

Table 13 also shows that in villages where most involuntary bachelors' behaviors are different from married men's, as well as western villages or high-bachelor-ratio villages, the percentage of villages with positive behaviors for most bachelors' is significantly lower, and that of villages with negative behaviors for most bachelors' is much higher. The trend for group

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security incidents is similar to that for the individual negative behaviors; that is, in villages where most involuntary bachelors' behaviors are different from married men's, or villages with a more serious marriage squeeze, the occurrence of group security incidents is much higher than in other villages. Thus, in the context of the male marriage squeeze, compared with married men, involuntary bachelors are at greater risk of both negative individual and group behaviors. With intensification of the marriage squeeze, the probability of such behaviors is likely to increase and augment the threats to public safety at the community level.

Involuntary bachelors' effect on community safety

In the survey we asked village cadres to assess the effect of involuntary bachelors on community development and safety (see Table 14). In only 37 percent of villages, cadre respondents thought involuntary bachelors in their villages had no negative effects on their community. The most common problem is an increase in the burden of old-age support. This may reflect the difficulty of old-age support for both involuntary bachelors and their parents. In rural China, with family support of the elderly being universal, involuntary bachelors are always financially vulnerable, and may not be able to support their parents in their old age. For old bachelors themselves, the absence of both marriage and family prevent them from obtaining support from family and they usually have not been able to save enough to support themselves in their old age (Das Gupta et al. 2010).

Table 14 here

Table 14 also shows that although most village cadres report that problems caused by bachelors do not exist or are not serious, 6.3% of respondents do report that these problems are very serious in their villages, while they are somewhat serious in 15.5% of villages. Thus the problems caused by gender imbalance and the marriage squeeze at present appear not to be too serious in contemporary China, so there is still an opportunity for the government and society to take positive measures to prevent further deterioration. However, if appropriate policies and measures are not adopted, village safety might face serious challenges in the future. There are

also significant differences between villages. Generally, in villages where bachelors' behaviors are different from married men's, and in villages with a more serious marriage squeeze (i.e., western and high-ratio-of-bachelors villages), there is a higher proportion of negative effects as well as a more serious community safety problem attributed to bachelors.

Conclusions

Using data from the Hundreds of Villages Survey carried out in 2009, this paper explores gender imbalance, the marriage squeeze, and their effects on community order and development, and the status of the marriage market in rural China. We directly assess the challenge of gender imbalance to social order and safety at the village level. We find that at present, both son preference and gender imbalance are widely prevalent in rural villages; both the SRB and the population sex ratio deviate from normal in eastern, central and western villages.

The marriage consequences of gender imbalance have become serious. A high proportion of villages are experiencing a male marriage squeeze where some men are unable to make timely marriages. Because of the effect of economic development and the trend of female marriage migration from west to east, in areas with a relatively low SRB, especially western villages, gender imbalance and the marriage squeeze are serious but in opposite directions. Men in less-developed western villages suffer more from the marriage squeeze and female out-migration. Evidence from our surveyed villages suggests that gender imbalance and marriage squeeze have negative effects on the marriage market, community economy and order, and threaten communities' development and safety. In areas with more serious gender imbalance and marriage squeeze, community safety is affected more. Because of the male marriage squeeze, women as brides have become commercialized, the marriage expense for men has increased sharply, mercenary marriage and marriage fraud have been emerging, and order in the marriage market is broken. The presence of involuntary bachelors also causes increasing irregular individual and

group behaviors, increases marriage instability, threatens community order and safety, and risks hindering economic development.

It is unfair to unilaterally emphasize involuntary bachelors' negative roles in community order and safety. Involuntary bachelors link gender imbalance, the marriage squeeze and community safety. First, they are a vulnerable group, and the victims of gender imbalance and the marriage squeeze. They and their families often suffer the discrimination and stress caused by their being single. Second, some of their irregular behaviors do have negative effects on community safety. Compared with married men, the probability of such behavior by involuntary bachelors is higher. Their desire for marriage and sex may increase the occurrence of extramarital affairs and harassment of women, and threaten family stability and women's safety. Their increased use of commercial sex entails risks of spreading venereal diseases into rural areas.

Our findings warn that the consequences of gender imbalance and the marriage squeeze are no longer just speculation. Because both gender imbalance and the marriage squeeze are expected to become worse, more men may fail to marry; community safety and even the wider security may be threatened in future years if the situation is not rapidly controlled. Therefore, the management of gender imbalance should also include controlling its consequences. The government and society should adopt and implement policies, such as regulating the order of the marriage market, severely punishing perpetrators of fraudulent marriages, developing a universal social insurance system, and taking steps to help vulnerable families, in order to respond to and prevent negative consequences of gender imbalance.

Compared with prior studies predicting the consequences of gender imbalance based on census data, historical data and criminological studies, this study offsets the paucity of empirical evidence, and yields interesting findings. Owing to data limitation, it only provides preliminary description on the relationship between gender imbalance and community safety. We expect further studies can provide more abundant quantitative evidence and deep analysis.

Notes

1 Irregular marriages here include mercenary marriage, fraudulent marriage, exchange marriage, and child marriage. Mercenary marriage (*Maimai hunyin*) refers to a marriage arranged by a third party, possibly a parent or a kidnapper, who, in order to obtain money or property, illegally forces someone to marry.

2 Because Spring Festival is the most important festival in China, most rural-urban migrants return to their hometowns and spend the holiday with their families and relatives.

3 Figures here were not shown as tables.

4 In some studies, such as Dykstra (2004), Liu and Jin (2011), age 50 is often regarded as the upper age limit, and those older than 50 are regarded as no longer marriageable.

5 Statistics from the Second China National Sample Survey on Disability in 2006 indicate that 6.34% of Chinese are disabled.

References

Banister, J. 2004. "Shortage of girls in China today," *Journal of Population Research* 21 (1):19-45.

Bloom, David E., David Canning, and Larry Rosenberg. 2011. "Demographic change and economic growth in South Asia," *PGDA Working Paper No. 67*.

Bose, A. 2001. "Fighting female foeticide: Growing greed and shrinking child sex ratio," *Economic and Political Weekly* 36 (36):3427-3429

Cai, Yong, and William Lavely. 2003. "China's missing girls: Numerical estimates and effects on population growth," *The China Review* 3 (2): 13–29.

Chang, Jianhua. 2006. *The Study of the State and Society in the Qing Dynasty*. Beijing, China: People's Press. (In Chinese)

Chen, Xiang-Shen, Yue-Ping Yin, and et al. 2007. "Detection of acute and established HIV infections in sexually transmitted disease clinics in Guangxi, China: Implications for screening and prevention of HIV infection," *Journal of Infectious Diseases* 196 (11): 1654-1661.

Chiu, Alice, Derek Headey, and Xiaobo Zhang. 2010. "Are India's gender imbalances inducing higher household savings?" *Selected Paper No. 10783 prepared for presentation at the Agricultural & Applied Economics Association 2010.*

Coale, A.J. 1991. "Excess female mortality and the balance of the sexes in the population: An estimate of the number of 'missing females'," *Population and Development Review* 17 (3): 517-523.

Coombs, Robert H. 1991. "Marital status and personal well-being: A literature review," *Family Relations* 40 (1):97-102.

Das Gupta, Monica, Avraham Ebenstein, and Ethan J. Sharygin. 2010. "China's bride shortage and upcoming challenges for elderly men," *World Bank Policy Research Working Paper No. 5351*.

Davin, Delia. 2007. "Marriage migration in China and East Asia," *Journal of Contemporary China* 16 (50):83-95.

den Boer, Andrea M. and Valerie M. Hudson. 2004. "The security threat of Asia's sex ratios," *SAIS Review* 24 (2):27-43.

den Boer, Andrea M. and Valerie M. Hudson. 2011. "Missing women and cycles of violence in China and India," (Unpublished).

Dreze, J. and R. Khera. 2000. "Crime, gender, and society in India: Insights from homicide data," *Population and Development Review* 26 (2): 335-352.

Dykstra P. A. 2004. "Who remains unmarried?" *Paper prepared for the symposium "The never-married in later life: Potentials, problems, and paradoxes" at the meeting of the Gerontological Society of America, Washington D.C.*

Ebenstein, A., and E. Sharygin. 2009. "The consequences of the 'missing girls' of China," *The world bank economic review* 23 (3):399-425.

Ebenstein, Avraham, and Ethan Jennings. 2009. "Bare branches, prostitution, and HIV in China: A demographic analysis," In Land, K.C., B. Gu, D.L. Poston, Q. Ren, C. Russell, J. Tucker, S. Wang, and X. Zheng (Eds.) *Gender Policy and HIV in China.* New York: Springer.

Ebenstein, Avraham. 2010. "The 'missing girls' of China and the unintended consequences of the one child policy," *Journal of Human Resources* 45 (1):87-115.

Edlund, Lena, Hongbin Li, Junjian Yi, and Junsen Zhang. 2007. "Sex ratios and crime: Evidence from China," *IZA Discussion Paper no. 3214.*

Fan, C. Cindy, and Youqin Huang. 1998. "Waves of rural brides: Female marriage migration in China," *Annals of the Association of American Geographers* 88 (2):227-251.

Fan, Maureen, 2007. "Oldest profession flourishes in China," *Washington Post,* http://www. Washingtonpost.com/wp-dyn/content/article/2007/08/04/AR2007080401309.html (August 5).

Festini, F., and de Martino, M. 2004. "Twenty five years of the one child family policy in China," *Journal of Epidemiology and Community Health* 58: 358-360.

Filmer, Deon, Elizabeth M. King, and Lant Pritchett. 1998. "Gender disparity in South Asia: Comparisons between and within Countries." *Policy Research Working Paper 1867.* World Bank, Development Research Group, Washington, D.C.

Gao, Kai.2001. "A review of studies on gender imbalance in ancient China since the 1990s," *Trends of Recent Researches on the History of China* (6): 22-25. (In Chinese)

Gates, Hill. 1996. *China's Motor*: *A Thousand Years of Petty Capitalism*. Ithaca: Cornell University Press.

Gu, Baochang, Feng Wang, Zhigang Guo, and Erli Zhang. 2007. "China's local and national fertility policies at the end of the twentieth century," *Population and Development Review* 33 (1):129-148.

Guilmoto, C.Z. 2009. "The sex ratio transition in Asia," *Population and Development Review* 35 (3): 519-549.

Guo, Songyi. 2003. "Examining the family relations in Ruzhui marriage from the angle of the Zhuixu's status," *History of Ming and Qing Dynasty* (1): 34-40. (In Chinese)

Hesketh, T. 2009. "Too many males in China: The causes and the consequences," *Significance* 6 (1):9-13.

Hesketh, Therese, and WeiXing Zhu. 2006. "Abnormal sex ratios in human populations: Causes and consequences," *Proceedings of the National Academy of Sciences* 103 (36): 13271-5.

Hudson, Valerie M., and Andrea M. den Boer. 2002. "A surplus of men, a deficit of peace: Security and sex ratios in Asia's largest states," *International Security* 26 (4): 5-38.

Jha, Prabhat, Maya A Kesler, Rajesh Kumar, Faujdar Ram, Usha Ram, Lukasz Aleksandrowicz, Diego G Bassani, Shailaja Chandra, and Jayant K Banthia. 2011. "Trends in selective abortions of girls in India: Analysis of nationally representative birth histories from 1990 to 2005 and census data from 1991 to 2011," *Lancet.* (Published online)

Jiang, Tao. 1993. *The History of Modern Population.* Jiangsu, China: Zhejiang People's Press. (In Chinese)

Jiang, Tao. 1997. "Gender and age structure in Chinese history," *The Study of Chinese modern History* (6): 1-22. (In Chinese)

Jin, Xiaoyi, and Lige Liu. 2009. "Identification of the social risks and anomia in the context of gender imbalance in China," *Journal of Xi'an Jiaotong University (Social Sciences)* (6): 41-50. (In Chinese)

Kasperson, R. E., Renn, O., Slovic, P., Brown, H. S., Emel, J., Goble, R., Kasperson, J. X., and Ratick, S. 1988. "The social amplification of risk: A conceptual framework," *Risk Analysis* 8 (2):177-187.

Lamichhane, P., T. Harken, M. Puri, P.D. Darney, M. Blum, C.C. Harper, and J.T. Henderson. 2011. "Sex-selective abortion in Nepal: A qualitative study of health workers' perspectives," *Women's Health Issues* 21 (3):S37-S41.

Li, Jianhong. 2004. "Gender inequality, family planning, and maternal and child care in a rural Chinese county," *Social Science & Medicine* 59 (4):695-708.

Li, S., Q. Jiang, and M. W. Feldman. 2006. *Gender Discrimination and Population Development.* Beijing, China: Social Sciences Academic Press. (In Chinese)

Li, Shuzhuo. 2007. "Imbalanced sex ratio at birth and comprehensive intervention in China," *4th Asia Pacific conference reproductive and sexual health and rights, Hyderabad, India.*

Li, Yan, and Shuzhuo Li. 2008. "Involuntary bachelors and stress and coping in rural China: An exploratory study of YC County in Henan Province," *Youth Studies* (11): 15-23. (In Chinese)

Liu, Lige, and Xiaoyi Jin. 2011. "Determinants of the rural men's possibility of first marriage in china: A perspective of social network." *Population Journal* (2): 21-30. (In Chinese)

Liu, lige, Xiaoyi Jin, Quanbao Jiang, and Shuzhuo Li. 2009. "Male marriage squeeze and interventions in Ming and Qing Dynasties: Implications for governing gender imbalance in contemporary China," *Zhejiang Social Science* (12): 77-82. (In Chinese)

Liu, Zhongyi. 2005. "Unbalanced ratio of marriage-age genders: Its effect on social operation," *Dongjiang Journal* 22 (4): 103-109. (In Chinese)

Lu, Juntao. 2006. "An investigation into the shortage of women in western rural China." *Chinese Writers* (19): 117-146. (In Chinese)

Meng, Lei. 2009. "Bride drain: Rising female migration and declining marriage rates in rural China," *Working Paper, Xiamen University Department of Economics.*

Messner, S. F., and R. J. Sampson. 1991. "The sex ratio, family disruption and rates of violent

      crime: The paradox of demographic structure," *Social Forces* 69 (3): 693–713.

Min, Han, and J. S. Eades. 1995. "Brides, bachelors and brokers: The marriage market in rural

      Anhui in an era of economic reform," *Modern Asian Studies* 29 (4): 841-869.

Mo, Lixia. 2005. *Study on the Effect of Rise in Sex Ratio at Birth*. Beijing, China: Chinese

      Population Press. (In Chinese)

National Bureau of Statistics (NBS). 2011. *Communiqué of the National Bureau of Statistics of

      People's Republic of China on Major Figures of the 2010 Population Census (No. 1)*.

      http://www.stats.gov.cn/english/newsandcomingevents/t20110428_402722244.htm. (April

      28).

Oldenburg, Philip. 1992. "Sex ratio, son preference and violence in India: A research note,"

      Economic and Political Weekly 27(49/50): 2657-2662.

Peng, X. J. 2006, "Macroeconomic consequences of population ageing in China: A computable

      general equilibrium analysis," *Journal of Population Research* 30 (4): 12-22 (In Chinese).

Peng, Yuanchun. 2004. "An exploration into the phenomenon of involuntary bachelors in

      poverty-stricken area," *Youth Studies* (6): 18-20. (In Chinese)

Peng, X. 2008. "Demographic shift, population ageing and economic growth in China: A

      computable general equilibrium analysis," *Pacific Economic Review* 13 (5): 680-697.

Sharma, M. 2008. "Twenty-first century pink or blue: How sex selection technology facilitates

      gendercide and what we can do about it," *Family Court Review* 46 (1): 198-215.

Shanthi, K. 2004. "Feminist bioethics and reproductive rights of women in India: Myth and

      reality," In Rosemarie Tong, Anne Donchin, and Susan Dodds (Eds.) *Linking Visions:*

      Feminist Bioethics, Human Rights and the Developing World. Lanham, MD: Rowman &

      Littlefield Publishers Inc.

Sommer, Matthew H. 2000. *Sex, Law and Society in Late Imperial China*. Stanford, CA:

      Stanford University Press.

Tan, Ping. 2002. "Gender imbalance and the rise and fall of the nation," *Journal of Chengdu University* (3): 24-29. (In Chinese)

Tucker, J. D., G. E. Henderson, T. F. Wang, Y. Y. Huang, W. Parish, S. M. Pan, X. S. Chen, and M. S. Cohen. 2005. "Surplus men, sex work, and the spread of HIV in China," *AIDS* 19 (6):539-547.

United Nations (UN). 2010. "World population prospects: The 2010 revision," http://esa.un.org/ unpd/wpp/unpp/panel_indicators.htm.

Wang, F., and A. Mason. 2008. "The demographic factor in China's transition," In Loren Brandt and Thomas G. Rawski (Eds.), *China's Great Economic Transformation*. Cambridge: Cambridge University Press.

Wang, Zhiqiang. 2000. "Marrying during a period of mourning, marrying a brother's widow and legal practices in the late Qing Dynasty," *Chinese Social Science* (6): 1105-117. (In Chinese)

Wei, Shangjin, and Xiaobo Zhang. 2009. "The competitive saving motive: Evidence from rising sex ratios and savings rates in China," *National Bureau of Economic Research Working Paper No. 15093, Cambridge.*

Wei, Yan, Xiaoyi Jin, and Shuzhuo Li. 2008. "Stress and coping in families with old unmarried male: Evidence from YC County in rural Henan China," *Population and development* 14 (5): 2-12. (In Chinese)

Wolf, A. P., and C. Huang. 1980. *Marriage and Adoption in China, 1845–1945*. Stanford, CA: Stanford University Press.

Wolf, Arthur P. 1974. "Gods, ghosts, and ancestors." In Arthur P. Wolf (Eds.), *Religion and Ritual in Chinese Society*. Stanford, CA: Stanford University Press.

Wong, Daniel Fu Keung, Chang-Ying Li, and He-Xue Song. 2007. "Rural migrant workers in urban China: Living a marginalised life," *International Journal of Social Welfare* 16 (1):32-40.

Yan, Yunxiang. 1996. *The Flow of Gifts: Reciprocity and Social Networks in a Chinese Village.* Stanford, CA: Stanford University Press.

Zhou, Yumin, and Yong Shao. 1993. *The History of Gangs in China.* Shanghai: Shanghai People's Press. (In Chinese)

Zeng, Y., W. Vaupel Vaupel, Zhenyu Xiao, Chunyuan Zhang, and Yuzhi Liu. 2002. "Sociodemographic and health profiles of the oldest old in China," *Population and Development Review* 28 (2): 251-273.

Zhao, Gracie Ming. 2003. "Trafficking of women for marriage in China: Policy and practice," *Criminal Justice* 3 (1): 83-102.

Zhu, Wei Xing, Lu Li, and Therese Hesketh. 2009. "China's excess males: Role of sex selective abortion and the one child policy," *British Medical Journal* 338: b1211. (Published online)

Table 1. Provincial distribution of surveyed villages

Eastern China		Central China		Western China	
Provinces	**Number of villages**	**Provinces**	**Number of villages**	**Provinces**	**Number of villages**
Liaoning	2	Heilongjiang	4	Chongqing	3
Hebei	7	Jilin	5	Sichuan	12
Tianjin	6	Shanxi	94	Guizhou	10
Shandong	15	Hunan	10	Yunnan	6
Jiangsu	5	Hubei	7	Shaanxi	105
Zhejiang	3	Jiangxi	8	Gansu	11
Shanghai	1	Anhui	11	Qinghai	7
Fujian	5	Hunan	10	Ningxia	4
Hainan	2			Xinjiang	3
				Inner Mongolia	1
				Guangxi	7
Total	**46**	**Total**	**149**	**Total**	**169**

Table 2. Basic characteristics of villages (averages)*

	Total villages	Eastern villages	Central villages	Western villages
Sample	**(364)**	**(46)**	**(149)**	**(169)**
Number of natural villages	4.9	5.0	4.3	5.4
Population				
Total population	2118.7	1839.6	2020.3	2279.7
Total households**	506.0	479.3	507.9	511.0
Family size	4.5	4.2	4.5	4.7
Labor migration				
Number of male migrant labor	270.8	195.0	233.1	323.8
Number of female migrant labor	152.5	105.8	133.8	181.2
Numbers of migrants per household	0.9	0.7	0.8	1.0
Male migrant labor per household	0.6	0.4	0.5	0.7
Female migrant labor per household	0.3	0.3	0.3	0.3
Terrain (%)				
Plains	35.2	58.7	35.6	28.4
Hills or valley	24.5	30.4	30.9	17.2
Mountains or plateaus	40.3	10.9	33.5	54.4
Average per capita income in 2008 (Yuan)	3571.0	5990.8	3146.6	3297.7

Note: * Figures in parentheses are sample size. Similarly hereafter.

** In 10 surveyed villages, the numbers of households are missing, so the sample size for both "Total households" and "Family size" are 354, including 41, 149 and 164 in eastern, central and western villages, respectively.

Table 3. Son preference, the SRB and one-child families

	Total villages	Eastern villages	Central villages	Western villages
Son preference	**(364)**	**(46)**	**(149)**	**(169)**
Most villagers still think each family should have at least a boy (%)	69.1	64.4	66.2	72.8
The number of newborns fell in recent years (%)	86.4	84.4	83.7	89.3
The main reason for the decline in births (%)*	**(305)**	**(37)**	**(119)**	**(149)**
It's the same to have a boy or a girl	19.9	23.7	21.8	17.4
Heavy economic pressure to feed more children	42.5	36.8	42.0	44.3
Strict family planning policy	35.0	36.8	33.6	35.6
Others	2.6	2.7	2.4	2.7
SRB	**(359)**	**(45)**	**(146)**	**(168)**
Total number of births	31.2	36.5	26.8	33.8
Boys	17.1	21.7	14.7	18.1
girls	14.1	14.8	12.1	15.7
The sex ratio at birth **	121.5	131.1	121.8	115.1
One-child families	**(354)**	**(41)**	**(149)**	**(164)**
One-child families/households (%)	12.2	21.4	10.1	11.9
One-son families/one-child families (%)	62.3	70.4	58.3	63.9

Note: * The sample sizes for "the main reason for the decline of newborns" are 305, 37, 119 and 149, respectively, based on the proportion of villages in which the number of newborns has declined in recent years.

** Because the number of newborns is too small in each village, the SRB for the total villages is the quotient of the total number of newborn boys divided by the number of newborn girls in 2008. That is, the SRB for the total villages = (the sum of newborn boys in the 364 surveyed villages / the sum of newborn girls in the surveyed villages) × 100%. The same method is used to calculate the SRB in eastern, central and western villages, respectively.

Table 4. Population sex ratio and involuntary bachelors

	Total villages	Eastern villages	Central villages	Western villages
Population sex ratio per village	**(364)**	**(46)**	**(149)**	**(169)**
Number of men	1122.7	944.5	1081.4	1205.6
Number of women	996.0	895.2	947.9	1074.2
Sex ratio of population	112.6	105.5	114.1	112.2
Involuntary bachelors	**(362)**	**(46)**	**(148)**	**(168)**
Total number of involuntary bachelors	3268	338	1200	1730
Number of involuntary bachelors per village	9.0	7.3	8.1	10.3
Number of bachelors per hundred households	2.7	2.3	2.4	3.2
Villages' distribution according to the ratio of bachelors*	**(354)**	**(41)**	**(149)**	**(164)**
High-bachelors-ratio villages (%)	27.6	24.4	25.2	30.7
Low-bachelors-ratio villages (%)	72.4	75.6	74.8	69.3

Note: *High-bachelor-ratio villages refer to those with three or more involuntary bachelors per hundred households, and low-bachelor-ratio villages refer to those with less than three involuntary bachelors per hundred households.

Table 5. Correlation between village characteristics and the number of involuntary bachelors per hundred households

Sample	Correlation with number of involuntary bachelors per hundred households (354)
Per capita income in 2008	-.105*
Male labor migrants/households	.102
Female labor migrants/households	.106*
Distance from county seat (Kilometers)	.210**
Distance from town seat (Kilometers)	.140**

Note: * p< .05, **p< .01, ***p< .001

Table 6. Evidence on men's difficulty in marrying from village cadres

	Total villages	Eastern villages	Central villages	Western villages
Sample	**(364)**	**(46)**	**(149)**	**(169)**
Assessment of the degree of men's difficulty in getting married (%)				
Very or somewhat difficult	47.5	38.9	49.3	50.9
Not or little difficult	52.5	71.1	50.7	49.1
Community factors affecting male villagers' marriage chance (%)				
More males than females in the same birth cohort	30.0	23.9	25.2	35.8
Poor economy leads more women to marry out and less to marry in	48.9	28.3	46.4	56.6
Many local women emigrate for work	42.2	32.6	29.8	55.5
Marriage expense is too high	55.4	65.2	64.2	45.1

Table 7. Basic characteristics of involuntary bachelors

	Total villages	Eastern villages	Central villages	Western villages
Sample	**(3268)**	**(338)**	**(1200)**	**(1730)**
Age (year)	41.4	44.3	42.6	39.9
Age group (%)				
28—30	18.2	10.5	15.2	21.8
31—40	37.6	33.3	35.9	39.5
41—50	23.6	25.9	25.4	21.9
51—60	12.5	17.7	14.1	10.4
60+	8.1	12.5	9.4	6.3
Physical health (%)				
Disabled	20.1	28.0	19.4	19.0
Not disabled	79.9	72.0	80.6	81.0

Note: Figures here were calculated using the data from the registration form for involuntary bachelors in 362 villages.

Table 8. Marriage expense

	Total villages	Region			Ratio of bachelors*	
		Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
Sample	**(364)**	**(46)**	**(149)**	**(169)**	**(256)**	**(98)**
Men's marriage expense (Yuan)	95,058.1	112,465.1	115,400.0	74,006.0	100,110.0	84,118.3
Women's marriage expense (Yuan)	27,151.9	22,744.2	40,346.9	17,184.8	31,624.3	16,473.4
Marriage expense ratio**	3.5	4.9	2.9	4.3	3.2	5.1

Note: * There are 10 cases with missing values on the number of households in the village, so the total cases for the villages based on the ratio of bachelors are 354. The number of villages with a low ratio of bachelors and with a high ratio of bachelors is 256 and 98, respectively. Similarly hereafter.

** The marriage expense ratio is the ratio of men's marriage expense to women's.

Table 9. Nonlocal brides from other counties between 2006 and 2008

	Total villages	Region			Ratio of bachelors	
		Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
	(364)	(46)	(149)	(169)	(256)	(98)
Number of out-of-county brides	24.2	35.4	21.5	23.8	26.3	18.4
Nonlocal brides from remote counties						
Are there nonlocal brides from more remote areas? (%)	**(364)**	**(46)**	**(149)**	**(169)**	**(256)**	**(98)**
Yes	59.9	54.4	63.1	58.6	56.7	63.9
Brokers' reward (%)*	**(218)**	**(25)**	**(94)**	**(99)**	**(145)**	**(63)**
0 Yuan	23.7	22.2	19.5	27.3	25.0	17.7
Below 1,000 Yuan	39.7	25.9	41.4	41.8	43.6	32.3
1,000-5,000 Yuan	30.4	40.7	29.9	28.2	26.9	40.4
Above 5,000 Yuan	5.2	11.1	9.2	2.7	4.4	9.7
Nonlocal brides' running away						
	(218)	**(25)**	**(94)**	**(99)**	**(145)**	**(63)**
Ratio of villages with runaway cases for nonlocal wives (%)	39.7	35.7	38.2	42.0	39.6	39.7
	(86)**	**(9)**	**(36)**	**(41)**	**(57)**	**(25)**
Average cases in villages with runaway cases	2.9	1.3	2.6	3.6	2.7	3.4

Note: * The sample size for both "Brokers' reward" and "Ratio of villages with runaway cases for nonlocal wives" is based on the number of villages with nonlocal brides from more remote areas.

** The sample size for "Average cases in villages with runaway cases" is based on the number of villages with runaway cases for nonlocal wives.

Table 10. Marriage fraud against involuntary bachelors between 2006 and 2008

	Total villages	Region			Ratio of bachelors	
		Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
Sample	**(364)**	**(46)**	**(149)**	**(169)**	**(256)**	**(98)**
Proportion of villages suffering marriage fraud (%)	27.8	28.3	27.4	28.0	25.0	34.4
Amount of financial loss (%)*	**(101)**	**(13)**	**(41)**	**(47)**	**(64)**	**(34)**
Below 3,000 Yuan	12.4	7.7	13.5	12.8	14.0	15.1
3,000-5,000 Yuan	28.9	30.8	10.8	42.6	29.7	21.2
5,000-10,000 Yuan	32.0	30.8	37.8	27.7	26.6	42.4
10,000 Yuan	26.8	30.8	37.8	17.0	29.7	21.2

Note: * The sample size for "Amount of financial loss" is based on the number of villages suffering marriage fraud.

Table 11. Effects of being single on involuntary bachelors and their families

	Total villages	Region			Ratio of bachelors	
		Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
Sample	**(364)**	**(46)**	**(149)**	**(169)**	**(256)**	**(98)**
Discriminated against because of being single (%)						
Very seriously	7.5	8.7	4.1	10.1	7.2	7.9
Seriously	40.7	39.1	38.4	43.2	40.1	43.3
Little or no discrimination	51.8	52.2	57.5	46.7	52.0	49.5
Effect on involuntary bachelors' family (%)						
No effect	9.1	10.9	11.4	6.5	10.8	6.2
On family members' psychology	73.4	67.4	67.1	80.5	70.5	81.4
On family relationship	53.8	41.3	48.3	62.1	51.8	59.8
On family economy	47.0	41.3	48.3	47.3	45.4	54.6
On reputation in the village	22.3	28.3	16.8	25.4	19.1	28.9

Table 12. Behavior difference between involuntary bachelors and married men

	Total villages	Region			Ratio of bachelors	
		Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
Sample	**(359)**	**(46)**	**(145)**	**(168)**	**(256)**	**(98)**
Most bachelors' behaviors are different from married men's (%)	49.2	42.2	48.3	51.8	48.2	52.1

Table 13. Behavioral characteristics of involuntary bachelors (%)

	Total villages	Involuntary bachelors' behavior		Region			Ratio of bachelors	
		Same as married men's	Different from married men's	Eastern villages	Central villages	Western villages	Low- bachelor-ratio villages	High- bachelor-ratio villages
Sample	(364)	(182)	(177)	(46)	(149)	(169)	(256)	(98)
Positive behaviors								
Helpful	40.4	45.3	36.4	45.7	38.8	40.5	40.1	41.2
Thrift	52.5	55.8	50.3	60.9	52.4	50.3	49.0	61.9
Filial	62.2	69.6	56.0	65.2	65.3	58.7	59.8	71.1
Negative behaviors								
Irritable	31.8	16.0	48.0	23.9	28.6	36.7	28.9	38.1
Loafing	45.6	33.1	58.2	43.5	43.5	47.9	45.8	45.4
Gambling	35.6	23.8	48.6	37.0	29.3	40.8	34.0	38.1
Harassing women	5.0	1.1	9.1	2.2	4.8	6.0	4.0	7.2
Destroying others' marriage	4.7	1.7	8.0	4.4	6.1	3.6	2.8	10.3
Commercial sex	6.7	2.8	10.9	4.4	7.5	6.6	5.6	8.2
Group security incidents								
Group fighting	7.8	6.0	9.6	6.5	8.2	7.7	7.5	9.3
Making trouble as a group	10.6	5.5	15.8	6.5	9.6	12.5	9.4	10.3
Group stealing	8.4	6.6	10.2	8.7	6.2	10.2	8.6	6.2

Table 14. Involuntary bachelors' effect on their communities (%)

	Total villages	Involuntary bachelors' behavior		Region			Ratio of bachelors	
		Same as married men's	Different from married men's	Eastern villages	Central villages	Western villages	Low-bachelor-ratio villages	High-bachelor-ratio villages
Sample	(364)	(182)	(177)	(46)	(149)	(169)	(256)	(98)
Involuntary bachelors' effects on their community								
No effect	37.1	46.7	27.1	39.1	42.3	32.0	40.9	30.9
The burden of old support	43.7	38.5	49.7	39.1	40.9	47.3	36.5	60.8
Moral value	25.8	18.7	33.3	26.1	20.1	30.8	26.6	22.7
Economic development	23.6	18.1	29.4	2.17	18.8	28.4	22.2	26.8
Community security	19.8	14.8	24.9	17.4	16.1	23.7	19.0	18.6
The severity of community safety problems caused by bachelors								
Nonexistent	23.2	29.7	16.4	20.0	23.6	23.7	27.6	14.4
Not serious	55.0	49.5	60.5	71.1	58.8	47.3	53.9	53.6
Somewhat serious	15.5	17.0	14.1	8.9	12.8	19.5	14.1	20.6
Very serious	6.3	3.8	9.1	0.0	4.8	9.5	4.3	11.3