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Condom use intentions among "forced" male bachelors in rural China: findings from a field survey conducted in a context of female deficit

1. INTRODUCTION

Excess female mortality, especially among children, has long been a characteristic of China's population (Banister, 2004). Over the past 30 years, this persistent excess female child mortality and the increasing sex ratio at birth (SRB) led to an increased deficit of females and to a concomitant surplus of males. As a consequence, it is estimated that there is a shortfall of more than 30 million women are currently in China (Klasen and Wink, 2002; Jiang *et al.*, 2005). Moreover, the imbalance in the SRB in the future will inevitably affect the sex ratios in the total population and increase the female deficit. Consequently, millions of young Chinese males may not be able to find a Chinese bride each year after 2010 (Tuljapurkar *et al.*, 1995; Poston and Glover, 2005; Li *et al.*, 2006). These males who cannot marry because of the male marriage squeeze are known in Chinese as *guang gun'er* ("bare branches" or "bare sticks") (Hudson and den Boer 2004), and are also called the "forced male bachelors". Such "bare branches" would tend to be concentrated in the extremely poor areas, where there is a greater shortage of marriageable females because of the female inclination to "marry up", high costs of marriage for males, and massive female out-migration (Chen, 2004; Peng, 2004; Tucker et al,. 2005; Zhang *et al.*, 2005; Shi, 2006). Indeed, males from poor rural areas are direct victims of the sex structure imbalance and are a new vulnerable group in the marriage market (Banister, 2004).

Marriage is traditionally universal in China, where everyone is expected to marry (Blayo, 1997). It remains an inevitable step to forming a family, producing offspring, and perpetuating patrilineal traditions. It remains "the route by which everyone must pass" (Evans 1997) and the only way to legitimate cohabitation of a man and a woman. Therefore, according to the prevailing social and moral norms, marriage is still a prerequisite for having "legitimate"

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sex in China's society (Liu, 1992). As a consequence of the increasing female shortage in the marriage market, male celibacy is now becoming a new demographic phenomenon in China. This growing male surplus is bound to impact sexual behaviors, by, for example, favoring sexual activity of forced male bachelors before and outside marriage and, in the medium run, relaxing social and moral norms.

Actually, some Western scholars suggest that an increasing male surplus and the subsequent number of forced male bachelors might lead to an increase in paid sex, male homosexuality, risky behaviors (such as alcoholism, drug abuse, etc) and violence, which would impact social stability, and even lead to serious political consequences (Eberstadt, 2000; Hudson and den Boer, 2004). For some Chinese scholars, the most important issue is the concentration of forced male bachelors in any given region, which may provide conditions for the development of the sex industry (Liu, 2005; Mo, 2005; Pang, 2006). Consequently, this could foster the transmission of sexually transmitted infections (STIs) and the spread of HIV (Poston and Glover, 2005; Ebenstein and Jennings, 2009; Merli and Hertog, 2010), because the forced male bachelors may become "bridging" persons between high and low risk populations (Tucker *et al.*, 2005).

In China as a whole, AIDS prevalence remains very low compared to most countries in Sub-Saharan Africa. Estimates shows that there were 48,000 people who became newly infected with HIV in China in 2009, compared to 1.8 million in Sub-Saharan Africa (UNAIDS, 2010). However, the situation is very critical in five provinces, which in turn account for more than the half of the population infected with HIV. According to China's Ministry of Health (2009), 42.2% of the newly infected persons at the national level were infected through unsafe heterosexual contacts, which remain the major transmission mode. But men who have sex with men and sex workers are also important factors in the development of the HIV epidemic. Consequently, safe sex promotion is one of the most important public health initiatives for preventing and controlling sexually transmitted infections. According to the World Health Organization, safer sexual behaviors include correct and consistent use of male and female condoms, sexual abstinence, a delayed first sexual experience and limiting the number of sexual partners (WHO, 2007). In particular, the male condom is currently the most effective means of reducing the spread of HIV and other STIs. The female condom is also effective and safe, but it cannot be used widely because of its high cost (WHO, 2007).

At the moment, sexual behaviors of forced male bachelors in rural China are still not well understood. What information we have is limited to historical speculations, derived from studies on male migrants (Li *et al.*, 2004; Tucker *et al.*, 2005; Hong *et al.*,. 2006; Yang and Xia, 2006; Li *et al.*, 2007) or from mathematic simulations (Merli *et al.*, 2006; Merli and Hertog, 2010). For instance, Tucker *et al.* (2005) stated that there was an obvious relationship between male surplus among migrant communities, the number of female sex workers, and the

prevalence of STIs, and concluded that males in surplus were engaging in increasingly risky sexual behaviors, and were then highly exposed to STIs and HIV. The mathematical simulation models proposed by Merli et *et al.* (2006, 2010) indicate that when fewer female sexual partners are available to males, the impact of the male surplus on the spread of HIV might be severe as these males may seek unprotected sexual intercourses with female sex workers. Another study recently conducted by South and Trent (2010) states that when Chinese men face a relative deficit of age-compatible women in their community, they are more likely to have sex with commercial sex workers but less likely to have premarital noncommercial sex and to be infected by STI's.

Reducing male heterosexual risk in HIV/STI's transmission is one of the most important but understudied aspects of HIV prevention and control in China (Tucker and Wang, 2009). Therefore, better understanding the factors affecting safe sexual behaviors of forced male bachelors in rural China may be important in decreasing this specific risk. This paper investigates the determinants of condom use intentions among forced male bachelors in rural China based on the theory of planned behavior, by analyzing the data of a field survey conducted in rural Anhui in 2008. In particular, it attempts to shed light on the specific socioeconomic characteristics of the forced male bachelors, their attitudes and practices toward condom use, and sexual behaviors. Are their behaviors and condom use intentions different from those of the married men? Do the factors influencing condom use intentions differ depending on marital status? As far as we know, the present study is the first quantitative investigation of the effect of condom use intentions among forced male bachelors in rural China.

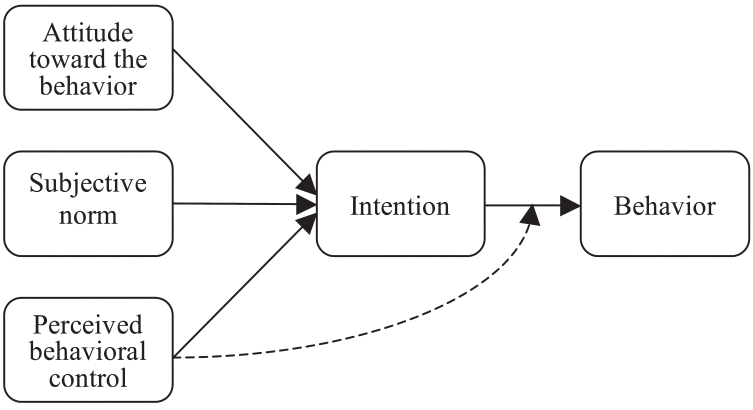
2. THEORETICAL FRAMEWORK

Theory-based interventions have been shown to be effective in reducing risky sexual behaviors (Sheeran *et al.*, 1999), and promoting healthy behaviors. Social cognitive theories have proven to be the most effective approach for addressing high-risk behaviors (Kirby, 1995; Kim *et al.*, 1997). Among such approaches, the theory of planned behavior (TPB)[1] (see Figure 1) is a widely applied model that has had some success in predicting a variety of health behaviors, such as automobile safety, exercise, sunbathing, behaviors in AIDS prevention, and especially condom use (see for instance Sheeran and Abraham, 1999; Albarracín, 2001). Armitage and Conner's meta-analysis

[1] The theory of planned behavior, which is an extension of the theory of reasoned action (TRA), includes the perceived behavioral control (PBC) as a predictor of intention, to account for situations in which behaviors are not under complete volitional control of the individual. For further explanation on this theory, see Fisher and Fisher, 2000; Liu and Cai, 2008; Schifter and Ajzen, 1985; Ajzen and Madden, 1986; Ajzen, 1985, 1991; Ajzen and Driver, 1991.

(2001) provides support for the efficacy of the TPB as a predictor of intentions and behaviors, as it suggests that the proximal determinant of volitional behavior is one's intention to engage in that behavior. Intentions and behaviors have proven to be strongly related when measured at the same level of specificity in relation to the action, target, context, and time frame, and when the time interval is short enough to ensure that intentions have not changed. Also, behavior intentions are influenced by the attitudes about the performing behavior, subjective norms, and perceived behavioral control.

Figure 1 – *The theory of planned behavior adapted from Icek Azjen (2006)*



Albarracín *et al.*, (2001) synthesized 96 data sets, using meta-analysis, to examine how well the TRA and TPB predict condom use. They reported a rather high correlation coefficient of 0.45 for the prediction of condom use from intention, and found that attitude was the best variable predicting behavioral intention. Armitage and Conner's (2001) meta-analysis for the TPB found that attitude could explain 49% of the variation of behavioral intention. However, because of the discrepancy in the operational definition of attitudes toward condom use, it is difficult to draw conclusions about the qualitative nature of the relationship between condom use attitudes and intention (Norton, 2005). According to Albarracín *et al.*, (2000), attitudes about condom use can be identified through four distinct factors: (1) The *protection factor*, which represents the beliefs about the effectiveness of condoms in preventing STIs, HIV and pregnancy. (2) The *pleasure factor*, which refers to the negative consequences of condom use on pleasure, intimacy, comfort, convenience, and mood. (3) The *interaction factor* which consists of anticipating the negative reaction of the sexual partner toward condom use. And finally (4) the *self-concept factor*, which includes items related to the positive emotions that result from condom use (e.g., less worry and responsibility, good feeling about oneself??). Given that these distinctions are relevant to respond to our research questions, the effects of these four factors will be measured in the following analysis.

As stated by Sutton (1994), "The past predicts the future". Indeed, condom use at the first sexual intercourse is reliably associated with subsequent condom use (Sheeran *et al.*, 1999). Condom use at last sexual intercourse also may affect future condom use because of a "recent effect". But some relationship between socio-demographic characteristics and condom use also exists. For example, age and marriage have a negative relationship with condom use (Sheeran and Abraham, 1999). Also, men with higher incomes are more likely to have unsafe commercial sex in China. The highest proportion of men who visited commercial sex workers were found among those with a senior high school education (Pan, 2004). Given that the poor and less educated males in rural China are more likely to remain unmarried, characteristics such as age, education and income will be added in the TPB model. Considering that more reliable contraceptive methods (such as IUD and female sterilization) are freely available to married couples and prescribed by the family planning authorities, the reasons for using condom would be very different between never-married and married men. Therefore, this paper examines the factors influencing condom use intentions among forced male bachelors in rural Anhui from two perspectives: one is a direct analysis of factors influencing condom use intentions, and the other is a comparison between these male bachelors and married men.

Finally, referring to the studies of Kashima *et al.*'s (1993) and Swan (1999), this paper makes a distinction between "sexual partner norm" and "general subjective norms" and examines their effects separately. "Sexual partner norm" can be defined as the influence and/or pressure exerted by one's sexual partner to use a condom or not during a sexual intercourse, while "general subjective norm" consists of one's beliefs about whether close relatives/friends (except the sexual partner) feel that they should use a condom or not. Perceived behavioral control (PBC), which reflects the opportunities and resources available to a person using a condom, is defined as ones perceived ease or difficulty in using a condom according to Ajzen's interpretation (1985; 1991).

In conclusion, although the TPB model can predict condom use intentions, it would be more effective if revised. Therefore, this paper analyzes the influence on condom use intentions by using revised variables in the model, namely four distinct condom use attitudes ("protective", "pleasure", "interactive", and "self-concept"); "sexual partner norm" and "general subjective norm", and "perceived behavioral control". It also includes an expanded variable of past behavior, and social-demographic variables.

3. METHODOLOGY

3.1 Data collection and survey limitation

Data used in this study are from the Older males' Reproductive Health and Family Life Survey in rural China which was conducted by the Institute for Pop-

ulation and Development Study (IPDS), Xi'an Jiaotong University, in JC county, Anhui province, from August to September (2008), in collaboration with INED in Paris. The survey collected data on opinions towards marriage and reproduction; HIV/AIDS/STIs-related knowledge; sexual behaviors; knowledge, attitudes and practices toward condom use; and socio-demographic characteristics of married and never-married men aged 28 or above (Zhang *et al.*, 2009; Li *et al.*, 2010). The decision to consider the age of 28 as a threshold for rural men is based on findings from qualitative interviews conducted during the pilot survey in YC county, Henan, in November 2007 (Li and Li, 2008; Wei *et al.*, 2008). This empirical observation is confirmed by China's 2000 census, which indicates that at the age of 28, 83% of males were ever married; at the age of 35, the proportion exceeds 95%. Indeed, the chance to marry is rather great for rural men before 28 years old but it decreases significantly after this age and diminishes almost entirely after the age of 35. As a consequence, the never-married men aged 28 and above are considered forced male bachelors in our analysis. It should be noted however that while this sample may include some men who voluntarily delayed their marriage until after the age of 28, this percentage is necessarily low. Our survey in JC county, Anhui, shows that while the vast majority of the never-married men still expect to marry one day, three out of four (71.6%) felt that it becomes difficult for a rural man to marry after the age of 30, and only one in six (15.4%) expects to marry within a year.

Anhui province is located in Eastern Central China, where a traditional patriarchal system and Confucian culture are prevalent, and where local residents have a strong son preference. In JC county, the sex ratio among the never-married population reached 177 males per 100 females in 2008, indicating that forced male bachelorhood may not be a residual phenomenon in this area.The survey sample was selected randomly (cluster sampling method) from the family planning administration registers in several villages attached administratively to the JC county. The county was divided into three zones, in which six townships or villages were selected, two in each zone. Four administrative villages were then randomly selected in each of these townships or villages, i.e. a total of 24 villages. Finally, 15 single men were selected from each village in order to obtain 5 men in each of the three age groups (28-34, 35-44 and 45 or +). Thereby a total of 360 single men aged 28 years or above were initially selected. However, when the total of 5 men by age group could not be reached, the remainder were primarily drawn from the next younger age group. In some cases, the selection was extended to men aged 27 years and to villages in a neighbouring township. In total, the sample of male celibates has been selected in seven townships and villages in JC county. Since the survey was purpose fully designed to study the characteristics of single men, they were intentionally overrepresented in the sample: the ratio of single to married men in our sample was 3: 2. In total, 665 men were

approached to complete the questionnaire; 38 of these withdrew during the process (a dropout rate of 5.7%). Six other questionnaires (0.9%) were excluded from the analysis because they were incomplete (and had been filled in in less than 20 minutes), which left a total of 621 usable questionnaires (93.4% of the initial sample), of which 41.5% (258) were married and 58.5% (363) were single. The questionnaires include 224 questions split into five main issues: 1) socio-demographic characteristics and opinions on celibacy and childlessness; 2) knowledge of reproductive health; 3) sexual behaviours and attitudes toward sexuality; 4) condom use; and 5) masturbation and use of pornography. Only results from parts 1), 3) and 5) are presented here. To guarantee anonymity to respondents and provide greater privacy and comfort, the CAPI (Computer-assisted Personal Interviewing) method was used. However, an interviewer was present to give technical assistance to the respondent when necessary, but sat in front of him so that he could not see the computer screen. Before starting the process, an interviewer read the regulations concerning privacy protection to each respondent, and informed him of the possibility of withdrawing at any time. In cases where the respondent was illiterate (38 cases) or had a low education level, the interviewer read the questions and explained how to answer alone. Respondents were given 45-60 minutes to answer the questionnaire. All investigators were male public health workers who work in the local population and family planning committee and had previous experience in administering surveys.

As in many other countries, particularly in the developing world, the survey could not have been conducted without the agreement of local authorities. They also took part in the focus groups. The questionnaires were handed out by employees of the local family planning bureau, trained and supervised by researchers from the IPDS who were also present throughout the data collection period. The presence and involvement of the local authorities did not seem to hamper data collection or affect the quality of the responses .

However, some limitations of the study should be noted. One limitation is that the survey was conducted in August, a peak period for temporary rural-to-urban migration. Given that high mobility among rural-to-urban migrants is associated with increased sexual risk (Li *et al.*, 2004), our study may have understated sexual risks among rural males to some extent, consequently finding fewer significant influencing factors. Another noticeable limitation is the rather small size of the in the present analysis. Because this paper focuses on condom use intentions, it actually considered only the respondents who answered "yes" to the questions "Have you ever had sexual intercourse?" and "Have you ever heard of the condom?". Ultimately, 97 questionnaires filled in by never-married men and 169 filled in by married men were used after removal of those who had never heard of condoms (13.5%), those who never had sex (24.5% in total, but 59.6% in never married men), and those males aged 55 years or above (11.9%). The latter were excluded because it was assumed that

men aged 55 or above were less sexually active and it was too sensitive for rural elder men to complete these questions in China, as observed by Pan (2004), and also because of missing data in some important items. Thirdly, JC County is similar to the whole country in many demographic characteristics (Li *et al.*, 2010) but the situation in JC cannot be generalized to the country as a whole. The findings in this paper pertain only to the localities sampled. Nevertheless, the findings shed light on current trends in condom use intentions that can be useful to researchers and health educators . Finally, due to the sample size limitation, only a limited number of independent variables were selected for the analysis. In spite of these limitations, however, this analysis below provides some useful information on condom use among male bachelors in rural area of China and suggests various avenues for further research.

3.2 Variable measurement

Condom use intentions. Condom use intentions are measured by two items (Swan, 1999; Valdez, 1999; Xiao, 2007). One is "How likely are you to use a condom when you have sex with your girl friend (when asked of never-married men) or wife (when asked of married men) in the future?". The other one is "How likely are you to use a condom when you have sex with a person like a prostitute, a sexual partner met on the internet, or other persons?". All used five-point Likert-type scales (1=very unlikely, 2=unlikely, 3=not sure, 4=likely, 5=very likely). These two items were combined to create a new synthetic variable with 9 points whose score is calculated as the mean of the two individual items. Considering the small sample and in order to simplify the analyses, the dependent variable is dichotomized into values equal to or lower than the mean (0) and values greater than the mean (1).

As explained above, there are three types of independent variables here: (1) variables of the TPB, namely attitudes, subjective norms, and perceived behavioral control; (2) expanded variables of the TPB, namely condom use at first and last sexual intercourse; and (3) three socio-demographic variables, namely age, education level and monthly income, which are identifiable characteristics of the forced male bachelors in rural China.

Condom use attitudes. Attitudes toward condom use are assessed by a 16-item scale, which was adapted from Xiao (2007) and DeHart and Birkimer (1997). Participants were asked to what extent they agreed or disagreed with 16 statements. The responses were converted into five-point Likert scales (ranging from 1 for "fully disagree" to 5 for "fully agree"), the higher scores indicating more positive attitudes toward condom use. Factor analysis revealed that one of these 16 items had factor loading lower than 0.4. After deletion of this item, exploratory factor analysis suggested four distinct dimensions in condom use attitudes, which are described above further in

details. (1) The "pleasure factor" (e.g., using a condom would decrease the sexual pleasure); (2) The "protection factor" (e.g., using a condom would decrease the risk of transmitting a sexually transmitted disease); (3) The "interaction factor" (e.g., using a condom would send a message that you don't trust your partner.), and (4) the "self-concept" factor (e.g., related to the positive emotions that result from condom use, e.g., less worry, more responsible behavior, feeling good about ones own). The Cronbach alphas for these four attitudes are 0.79, 0.81, 0.60, and 0.65 respectively.

General subjective norms. General subjective norms are assessed by asking respondents what would be the opinions of their close male and female friends, parents and other acquaintances toward them when using condoms. These items are rated on a scale from 1 ("strongly opposed") to 5 ("strongly in favor"). Participants' motivation to consider the opinions of these people was rated on a scale of 1 ("not influenced") to 5 ("very influenced"). The normative belief and influence rating are multiplied together to compute a product term. The total cross product for close male and female friends, parents and other acquaintances constituted the general subjective norms. The higher scores indicated greater subjective norms.

Sexual partner norm. Sexual partner norm is measured by asking participants what would be the opinion of their sexual partner toward them when using condoms. The same procedure and response scale as for general subjective norms are used to assess the individual's sexual partner norm.

Perceived behavioral control. Eight items adapted from Swan (1999) are used to assess perceived behavioral control (PBC) and all used five-point Likert-type scales (1 for "fully disagree" and 5 for "fully agree"). The higher scores indicate greater perceived control of condom use. The Cronbach's alpha of PBC is 0.80.

Past behavior. Two items are used to measure behaviors toward condom use in the past. "What prevention method(s) have you used at first sexual intercourse?" and "What prevention method(s) have you used at last sexual intercourse?". Responses included: "withdrawal method", "condom", "oral contraceptive", "safe period rhythm", "other methods", and "no method". Participants who specified "condom" were scored with a 1, and those who didn't specify condom were scored with 0.

Socio-demographic variables. The survey collected the age, education level, marital status, and monthly income of the respondents. We coded these socio-demographic variables as dummy variables: age (with 0 for ages equal to or lower than the mean age and 1 for ages above the mean age), education (with 0 for education level equal to or lower than 9 years and 1 for education level higher than 9 years), monthly income (with 0 for a monthly income lower than 1000 yuan and 1 for a monthly income higher than 1000 yuan), and marital status (with 0 for ever-married men and 1 for never-married men).

3.3 Analytic strategy

The role of marital status and other variables in the extended model of TPB was examined first. Then, the influence of condom use intentions as measured from variables and extended variables in TPB, and from socio-demographic variables, was tested directly among rural forced male bachelors and indirectly by comparison to married men.

Statistical descriptive analysis (frequency and mean) of all variables used in this study were conducted, Chi-square tests and t-tests being applied to assess the differences between never-married and married men. Several logistic regression models were conducted to test the effects of marital status on condom use intentions in the total sample: (1) effect of marriage on condom use intentions; (2) effect of marriage and variables of the TPB on condom use intentions; (3) effect of marriage and variables of the extended TPB on condom use intentions and (4) effect of marriage and variables of the extended TPB on condom use intentions after adding socio-demographic variables. Finally, separate logistic regression analyses were performed to identify variables associated with condom use intentions among forced male bachelors and married men in rural China.

Following the analytic strategy described above, 10 regression models were used. Models 1-4 were used to test the role of marriage and variables of the extended TPB on condom use intentions in the total sample. Models 5-7 were used to identify the factors of condom use intentions among rural forced male bachelors while models 8-10 were used to identify the factors of condom use intentions among rural married men. Models 5 and 8 tested the raw effect of the TPB. Models 6 and 9 tested the raw effect of the extended TPB while models 7 and 10 tested its net effect after adding the socio-demographic variables.

4. RESULTS

4.1 Descriptive statistics

Table 1 presents descriptive statistics of the variables selected in this paper. It indicates that never-married men were younger than married men (with mean ages of 35.4 and 38.5 years old respectively), but were significantly less educated and had lower monthly income. This is consistent with general knowledge about forced male bachelors in rural China (Banister, 2004, Tucker *et al.*, 2005). As compared to married men, a significantly higher proportion of never-married men reported more potentially risky sexual behaviors. Among those rural never-married men who ever had sexual intercourse, two-fifths (40.6%) reported more than one sexual partner in their life (versus 24.3% of the married men), and nearly one-third (30.2% compared to 14.2% for married men) reported transactional sex (i.e. exchanging money, food,

shelter, or other items for sex). Only 34.4% of never-married men reported using condoms every time when having sexual intercourse with a person like a prostitute, a sexual partner met on the internet, or other persons, in the past three months, and 42.7% reported that they never or rarely used condoms during the three months prior to the survey. Among the never-married men who had more than one sexual partner in their life and ever had transactional sex, 44.6% reported that they never or rarely used condoms during the three months prior to the survey. (Data are not shown here).

Table 1 – *Socio-demographic characteristics, attitudes, subjective norms, perceived behavior control, and past behavior according to marital status*

Characteristics	Never-married	Married	Total
N	96	169	265
Socio-demographic			
Mean age (SD)	35.4 (6.9)	38.5 (6.6)	37.4 (6.9)
More than 9 years education (%)	17.7	32.5	27.2
Monthly income over 1000 (yuans) (%)	51.0	55.0	53.6
Mean of condom use attitudes (SD)			
Pleasure	1.8 (0.7)	1.8 (0.7)	1.8 (0.7)
Protection **	3.2 (1.1)	3.6 (1.0)	3.4 (1.0)
Interaction	1.5 (0.6)	1.5 (0.6)	1.5 (0.6)
Self-concept	2.1 (0.9)	2.2 (0.9)	2.2 (0.9)
Mean of subjective norms (SD)			
Sexual partner norm	2.3 (1.4)	2.3 (1.4)	2.3 (1.4)
General subjective norms	1.5 (1.1)	1.4 (1.0)	1.5 (1.0)
*Mean of perceived behavioral control (SD)****	3.4 (0.7)	3.7 (0.6)	3.6 (0.7)
Past behavior (%)			
Condom use at first sexual intercourse +	24.0	15.4	18.5
Condom use at most recent sexual intercourse***	37.5	17.8	24.5
Condom use in the future *	58 (60.4)	78 (46.2)	136 (51.3)
Mean condom use intention *	2.7 (1.03)	2.6 (1.01)	2.7 (1.02)

Note: Level of significance: +p<0.1 *p<0.05 **p<0.01 ***p<0.001. SD=Standard Deviation.

The majority of never-married men (60%) reported that they were likely or very likely to use condoms in the future. This was significantly higher than among married men (46%). The mean score of condom use intention for never-married men is 2.71, which is slightly higher than that of the married

men (2.62). As expected, participants who were younger, with higher education level, and higher monthly incomes were more likely than others to report wanting to use a condom in the future (see Table.2). However, condom use intentions are significantly different by age and monthly income between never-married men and married men. Table 2 shows that younger never-married men are more likely to use condom in the future than younger married men, yet older never-married men are less likely to want to use a condom than older married men. Never-married men, regardless of income, are more likely to use a condom in the future than married men in the corresponding monthly income group.

Table 2 – *Mean scores on condom use intentions according to marital status, by selected characteristics*

Characteristics	Score		
	Never-married	Married	Total
*Age***			
Age<=mean age	3.05	2.77	2.90
Age>mean age	2.14	2.49	2.40
Education			
0-9 years education	2.60	2.65	2.63
More than 9 years education	3.21	2.54	2.69
*Income**			
Monthly income under 1000 (yuans)	2.52	2.43	2.46
Monthly income over 1000 (yuans)	2.89	2.77	2.81

Note: Level of significance: +p<0.1 *p<0.05 **p<0.01 ***p<0.001.

Of the four factors related to condom use attitudes, the score for "protection" was the highest and the score for "interaction" was the lowest for both never-married and married men. The mean score for "protection" factor, which was over 3 for both never-married and married men, indicated that both generally agree with the protection function of the condom, but the score was a little higher for married men (3.2 and 3.6 respectively). The scores of the other three factors related to condom use attitude ("pleasure", "interaction" and "self-concept"), which were lower than 3, indicated that males generally agree with the idea that condom use harms psychological and physical satisfaction, suggests less attention toward the partner's sexual feelings, and brings less positive emotion.

The scores of "sexual partner norm" and "general subjective norms", which were lower than 3, indicate that the respondents consider that the sexual partner and other people around them had little influence on whether they used a condom or not. There wasn't a significant difference in subjective

norms between never-married and married men. But relatively speaking, the sexual partner had a greater influence on them. Married men had a much higher score of "perceived behavioral control" than never-married men indicating that they have a significantly stronger ability to control condom use.

4.2 Role of marital status on condom use intentions

In our sample, the proportion of never-married men who used a condom at both the first and most recent sexual intercourse is significantly higher than that of married men. Table 3 illustrates the role of marital status on condom use intentions in the total sample (married and never-married men). We found that marriage is associated with an increased odds ratio of condom use intentions from model to model 1-3. This indicates that never-married men are more likely to use a condom than married men in our survey. Model 2 reveals that variables of the TPB, namely attitude, subjective norms, and perceived behavioral control, are to some extent associated with condom use intentions. Model 3 indicates that after adding past behavior, condom use at the most recent sexual intercourse is significantly related to condom use intentions, but perceived behavioral control is not significant any longer. Model 4 shows that after adding the socio-demographic variables, age is significantly associated with condom use intentions, but marital status becomes less significant.

Table 3 – *Odds ratios from logistic regression analysis of condom use intentions in total sample*

Characteristics	Model 1	Model 2	Model 3	Model 4
	OR	OR	OR	OR
Marriage (ref: married)	1.78 *	2.48 **	2.01 *	1.71 +
Attitudes				
Pleasure		0.97	0.97	0.98
Protection		1.35 *	1.36 *	1.41 *
Interaction		1.48 **	1.40 *	1.40 *
Self-concept		1.13	1.13	1.14
Subjective norms				
Sexual partner norm		1.08 **	1.07 *	1.09 **
General subjective norms		1.00	1.00	0.99
Perceived behavioral control		1.33 +	1.29	1.27
Past behavior				
Condom use at first sexual intercourse			1.62	1.56

...Cont'd...

Table 2 – *Cont'd*

Characteristics	Model 1	Model 2	Model 3	Model 4
	OR	OR	OR	OR
Condom use at most recent sexual intercourse			2.96 **	2.54 *
Age				0.40 ***
Education				0.57
Monthly income				1.31
Pseudo R2	0.014	0.127	0.167	0.206
LR x2 p value	<0.050	<0.001	<0.001	<0.001

Note: Level of significance: +p<0.1 *p<0.05 **p<0.01 ***p<0.001. OR=OddsRatio.

In performing sensitivity diagnostics, we found that marital status becomes less significant after the addition of age. This suggests that the association between marital status and condom use intentions might be a spurious function of age. However, we would also have expected that age and marital status were likely to have similar effects on condom use intentions. This means that the relationship between marriage and condom use intentions is not simple and needs further analysis. Thus, multiple logistic regressions were performed to examine condom use intentions separately among never-married and married men.

4.3 Factors influencing condom use intentions among forced male bachelors in our survey

Table 4 presents six logistic regression equations predicting condom use intentions among never-married men and married men. Model 5 reveals that never-married men who had a more positive interactive attitude, higher sexual partner norm, and higher perceived behavioral control are more likely to use a condom in the future. Model 6, which includes past behavior variables, shows that never-married men who used a condom at their first sexual intercourse have a higher probability of using a condom in the future ("condom use at last sexual intercourse" was omitted because of co-linearity between condom use at first and last intercourse and little effect of condom use at last intercourse on condom use intentions). Model 7, which includes the socio-demographic variables, indicates that age is significantly related to condom use intentions.

Table 4 – *Odds ratios from logistic regression analysis of condom use intentions according to marital status*

Characteristics	Never-married			Married		
	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
	OR	OR	OR	OR	OR	OR
Attitudes						
Pleasure	1.11	1.10	1.13	0.89	0.87	0.87
Protection	1.18	1.32	1.33	1.47 *	1.44 +	1.48 +
Interaction	1.91 *	1.87 *	1.90 +	1.48 *	1.43 +	1.51 *
Self-conception	1.07	1.01	1.35	1.23	1.23	1.23
Subjective norms						
Sexual partner norm	1.11 *	1.12 *	1.17 *	1.09**	1.07 *	1.08 *
General subjective norms	0.97	0.96	0.94	1.02	1.03	1.02
Perceived behavioral control	2.25 ***	2.17 **	2.25 *	0.92	0.91	0.89
Past behavior						
Condom use at first sexual intercourse		4.14*	4.08 +			
Condom use at most recent sexual intercourse					3.56 **	3.45 *
Age			0.10 ***			0.67
Education			1.42			0.40 *
Monthly income			1.10			1.30
Pseudo R2	0.20	0.24	0.37	0.10	0.13	0.17
LR x2 p value	<0.001	<0.001	<0.001	<0.01	<0.001	<0.001

Note: Level of significance: +p<0.1 *p<0.05 **p<0.01 ***p<0.001. OR=OddsRatio.

Model 8 through 10 show the factors influencing condom use intentions among rural married men. After comparing these six regression models, we found out that marital status is a factor that obviously influences condom use intentions in the sample. In comparison to married men, the only factors influencing condom use intentions among rural forced male bachelors are perceived behavioral control, condom use at the first sexual intercourse, and age.

Many other plausible influencing conditions and factors mentioned in the literature, including knowledge about the condom, experience of transactional sex, awareness of multi-partnered sex of the sexual partner, when

included individually or in combination with other risky conditions or factors, are not significantly associated with condom use intentions in our study and were consequently excluded from the models.

5. DISCUSSION

As stated in the introduction, China will face a growing male surplus on the marriage market. These males having only limited opportunities to get married with a Chinese spouse, or even to find a regular sexual partner (Li *et al.*, 2010). Being deprived of a "legitimate" sexual partner within marriage, these forced male bachelors are presumably more likely to have risky sexual behaviors with a higher number of sexual partners. This is apt to significantly increase the probability of HIV/AIDS and the transmission of other STIs, where forced male bachelors become "bridging" populations from high to low risk groups (Tucker *et al.*, 2005). But the extent to which these male bachelors increase the risk of transmission of such diseases depends on their attitudes and practices toward using a condom when having sexual intercourse. This is confirmed by our survey, which indicates that rural forced male bachelors have a higher propensity to risky sexual behaviors (such as multiple sexual partners and transactional sex) than married men. This finding highlights the need to promote condom use in sexual encounters involving high and low risk partners.

This study found that all TPB components (attitude, subjective norms, and perceived behavioral control), expanded TPB components (condom use at first sexual intercourse), and age are significant factors influencing condom use intentions among rural forced male bachelors. However, the factors that were significant for this group differ from those that were significant for rural married men.

For both forced male bachelors and married men in rural China, interaction related to condom use attitudes is an important factor influencing condom use intentions, while pleasure and self-concept factors are not. This is not consistent with the results of Albarracín *et al.* (2000), who found that self-concept and pleasure were more strongly associated with condom use intentions, whereas protection and interaction generally had little influence. One possible explanation for this difference could be that Americans are more concerned about the feelings brought through condom use (Norton, 2005) and agree more with "sex" perceived as an expression of emotion and interaction (Wyatt, 1994), whereas Chinese often consider that people can have "sex" but cannot talk about "sex" openly. Moreover, a positive protective attitude appears to be a significant predictor of increased condom use intentions only for rural married men. An alternative explanation for this is the Chinese traditional culture and context. On the one hand, a majority of Chinese people, especially in rural areas, still consider that the most important function of sex-

ual activity is to produce offspring. On the other hand, the strict birth planning policy sets fertility behaviors and contraception up as a social duty and responsibility (Zhu *et al.*, 1997). Therefore, as a rule, new couples need to be familiar with several different contraception methods when they receive an official marriage certificate. They are also told that a condom is a very important free contraceptive method. On the other hand, there is no official approach to contraception and protection from risky sex specifically targeting rural never-married men. This might be the reason why rural married men had significantly higher protective attitude scores as compared to never-married men.

This study supported the evidence that a higher sexual partner norm could improve condom use intentions (Kashima, 1993; Swan, 1999). Zhang, (2008) conducted research on intentions to have sexual intercourse among college students and found that subjective norms were not a significant predictor. He did not separate sexual partner norm from subjective norms. It might be culturally accepted that sexual partner norm is a significant predictor of condom use intention. First of all, "sex" is a very sensitive issue in China, especially in rural areas; it is a private concern that should be confined to the private sphere and not be discussed openly (Pan, 2004). This concept inhibits discussions and exchanges about sex, and hampers further knowledge about other people's opinions about condom use. Secondly, decision-making in sexuality does not depend only on the individual but to a large extent involves the cooperation of the sexual partner to a large extent (Soler *et al.*, 2000). Also, discussions and exchanges about sex with the sexual partner are in line with the traditional moral standards and can increase the likelihood of condom use intentions (Sheeran *et al.*, 1999).

It is important to note that perceived behavioral control is a significant factor influencing condom use intentions for rural forced male bachelors but not for married men. One possible reason might be that the determinants of condom use are completely different for rural married men and bachelors. For married men, the condom is free, readily available in local family planning cadres, and mainly a contraceptive device voluntarily chosen to the substitute of another long-acting method. According to the theory of reasoned action (Ajzen, 1975), volitional behavior is a function of attitudes and subjective norms. Thus, perceived behavioral control is not significantly associated with condom use intentions among rural married men. However, rural bachelors do not have any official channel through which to be informed about how to use a condom nor can they obtain them at no cost. In China, when a never-married person uses a condom, it is a voluntary and deliberate decision. This subpopulation is in need of better information, not only about when and how to use a condom correctly, but also greater access (such as how and where to obtain them Among never married men, higher perceived behavior control may improve condom use intentions.

This study also supports the evidence that past behavior is a significant

predictor of condom use intentions (Sheeran, 1999). In our survey, rural forced male bachelors who used a condom at first sexual intercourse are more likely to use it again in the future. But for the rural married men, those who used a condom at their last sexual intercourse are more likely to use a condom in the future. This difference may be explained by considering the different purposes of condom use depending on marital status. For most of the married men, the main purpose of condom is contraception (especially when the female partner does not use any other contraceptive method), and most of those who chose the condom once would have no choice but to continue using it in subsequent sexual encounters (Zhao *et al.*, 2006). So we could predict their next behavior from the last one. For the never-married men, the purpose of using a condom is more complex and unpredictable. However, condom use at first sexual intercourse could have an important impact on subsequent use (Sheeran *et al.*, 1999), as evidenced by the above analysis. This finding indicates that the sooner the intervention the better, and that when implementing HIV and STI prevention programs, it is critical to implement safe sex education before sexual initiation (Sheeran *et al.*, 1999).

Finally, our analysis indicates that although poverty and low levels of education are more likely to be characteristics shared by the rural forced male bachelors, they are not significantly associated with condom use intentions. Age is the only socio-economic variable significantly associated with condom use intentions. This indicates that bachelors in older age groups are less inclined to use a condom in the future. Such a result has also been evidenced by other surveys among male migrants in China and among males in other countries (Sheeran *et al.*, 1999; Zheng and Zhou, 2006).

Undeniably, the current study provides new information about sexual risk factors among forced male bachelors in rural China, and helps to better understand condom use mechanisms among this specific population group. It also provides theoretical support for implementing HIV/AIDS and STIs interventions early in the sexual life course. Moreover, this research may be a starting point for further in-depth research on sexuality of forced male bachelors in rural China.

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Appendix

Items and Factor Loadings for Condom Use Attitudes Factors

Item	Factor loading
Factor 1: Pleasure Attitudes	
The idea of using a condom doesn't appeal to me.	0.79
The price of a condom is too high	0.73
The sensory aspects (smell, touch, etc) of condoms make them unpleasant.	0.70
It would be embarrassing to buy or ask for a condom	0.69
Using a condom would interrupt the pleasure of sex.	0.53
Using a condom would decrease my psychological and physical sexual pleasure.	0.51
Factor 2: Protection Attitudes	
Using a condom would decrease the risk of transmitting asexually transmitted disease and HIV infection.	0.88
Using a condom would prevent be pregnant.	0.86
Factor 3: Interaction Attitudes	
Suggesting that we use a condom would send a message to my partner that I don't trust her.	0.79
A condom is not necessary if you know your partner.	0.64
It's a hassle to use condoms.	0.54
It would be closer if not using condom during sexual intercourse.	0.57
Factor 4: Self-concept Attitudes	
People can get the same pleasure from "safer" sex as from unprotected sex.	0.79
The proper use of a condom could enhance sexual pleasure.	0.82
Using a condom would demonstrate responsible sexual behavior.	0.62