The Impact of Subjective Norms: The Theory of Reasoned Action Together with the Social Ties Structure Predict the Intention to Select Fetal Sex in Rural China

Abstract:

In this paper we use the concepts of Behavioral Intention (a person's relative degree of intention to perform a given behavior) and the Theory of Reasoned Action (TRA) (behavioral intention can be predicted by the individual's attitude and subjective norms of other people's attitude) to develop a model of fetal sex selection in rural China. Using the TRA model and primary data collected from surveys conducted in three counties of SX Province, we analyzed the impact of subjective norms on an individual's behavioral intention to select the sex of their fetus. Results suggest that, whether or not to select the sex of one's fetus during pregnancy is determined primarily by the individual's attitudes toward the relative worth of having a male or female child (son preference). In this model, the subjective norms of groups in an individual's social ties structure strongly affect the individual's intention to sex-select. Different types of social ties correlate differently with the intention to sex-select indicating that the choice to sex-select during pregnancy is an outcome of a tension between blood ties and marital ties, strong ties and weak ties.

Key words: Son preference, Sex-selection Induced Abortion, Birth Control Policy, Uxorilocal Marriage, Sex ratio

BACKGROUND

The decrease in fertility rate and the widely used B-ultrasound for following a pregnancy and determining the sex of the fetus has led to an increase in sex ratio at birth (SRB) which demonstrates a preference for male children (Das Gupta et al., 2003; Jiang et al., 2005; Guilmoto, 2009). As one of the regions of the world in which there is a culture of son preference, China has been observing higher SRB since 1980, with an increase from 108 males/100 females to around 120 in 2005, decreasing slightly after 2005. Data from the National Bureau of Statistics of China Report #119.45 show that 2009 marked the first decline of the SRB in the last five years (National Bureau of Statistics of China, 2009). This generally high SRB suggests that sex-selection behaviors among parents exist with a preference for sons driving the statistics (Qiao, 2004; Shi, 2011).

Many surveys reveal that fetal sex-selection is a process that starts from an attitude, progresses to a behavioral intention and then becomes an actual behavior With respect to son preference in China it mainly occurs in rural areas or among rural-urban migrants (Chu, 2001; Qiao, 2004; Liu & Pan, 2005). Existing research has analyzed fetal sex-selection from two perspectives: 1) the micro-economic perspective which uses a cost-benefit analysis to suggest that fetal sex-selection is a process of reasoned action—a son bestows more benefits since a son is expected to provide old-age support for his parents and economic support for the family (Tang, 1991; Zhu, 2010) and 2) the cultural which is based on a traditional culture that values boys more highly than girls, a son preference which has been inherited historically

(Lv et al., 2002; Wei, 2006). Although the above two perspectives are not mutually exclusive in their explanatory value for the intention to sex-select, they ignore the relationship between the individual's behavior and the current society's norms. As well, they ignore the role that current culture plays in the psychological mechanisms of decision-making (Liu, 2005).

Therefore, the current study aims to analyze the underlying psychological mechanisms on decision-making for fetal sex-selection within the contemporary culture of rural China. Combining the Theory of Reasoned Action (TRA) and social ties structure into one model reveals the impact of subjective norms on fetal sex-selection and provides insights for developing policy directed at sex imbalance in China.

STUDY FRAMEWORK

Son preference originated in the strict patrilineal family system, under which a son has an important role in three key areas: economic, cultural and religious; without a son, it is impossible to have economic security in old age, representation on the family tree, and the ability to include the family's name in ancestral temple (Li, 2003; Liu, 2006; Deng, 2008). Therefore, fetal sex-selection during pregnancy is regarded as a reasoned action for achieving the above functions (Zhu, 2010). Within contemporary Chinese culture fetal sex-selection commonly occurs in two phases: 1) first there is a B-ultrasound to determine the sex of the fetus with non-medical purpose then 2) there is an illegal, induced abortion to eliminate the fetus of the unpreferred sex (Liu et al., 2005). When a family or parents hope to have a son, they undergo an ultrasound to

determine the sex of the fetus after four-months of pregnancy. If ultrasound reveals a male, parents bring the pregnancy to term. However, if it reveals a female the pregnancy will be aborted (Chu, 2001).

TRA was proposed as a classic model in social psychology for predicting an individual's decision-making behavior based on these individuals being rational actors (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980). Because the actual behavior is hard to measure, intention often becomes a proxy for the behavior itself (Fishbein & Ajzen,1975). TRA involves two variables for predicting behavioral intention: 1) attitude and 2) subjective norms. Attitude is a hypothetical construct that represents an individual's degree of like or dislike for something; subjective norms is an individual's perceptions of surrounding people's (their family, friends, and the society) degree of like or dislike for something (Fishbein & Ajzen,1975; Ajzen & Fishbein, 1980). According to this then, we can infer that during pregnancy the sex-selection intention (SSI) is determined by the individual's attitudes toward the infant's sex plus the individual's perception of surrounding people's attitudes toward the infant's sex. The question is: in rural China, whose attitudes have the greatest impact on the individual's SSI during pregnancy?

In China, high SRB was reported to have been closely related to regions in which son preference is dominant. It was found that in Yangtze River valley and Huanghe River valley where the Han culture is intensive and son preference is strong, the SRB is much more distorted and much higher than elsewhere (Li, 2001; The expert group of National Office for Care for Girls Campaign, 2008). Such regions not only have a son preference but they adhere to a traditional societal structure, Chaxugeju, a societal

system that establishes both the associations between people and the relative strength of those associations (social ties structure). In this societal structure, the individual's ego is at the center and all other human roles are deployed in different distances around the ego, like the image of the ripples resulting from throwing a stone into a pond (Fei, 1997, 1999; Bian,1997; Chang, 2010). The rings of the ripple represent different spheres each sphere representing social ties with different strengths of influence on the individual's attitude and behaviors (as shown in Figure 1). According to other researchers studying "Chaxugeju", the subjective norms in rural China involves four social ties: blood, marital, regional, business/friendship and seven groups: parents, siblings, spouse, spouse's parents, acquaintances/friends, neighbours and villagers (Bian,1997; Chang, 2010). A previous qualitative study using this subjective norms scale demonstrated that expressions of SPA varied according to the seven groups. Groups directly related to infant, such as an individual's parents, spouse and spouse's parents, commonly expressed their attitudes toward the sex of the infant as "happy" or "unhappy"; groups not so directly related to the infant, such as individual's siblings, neighbors, villagers, acquaintances or friends, commonly expressed their attitudes toward the sex of infant as "envious" or "not envious".

In rural China, strong ties are blood, marital or regional ties. Weak ties are business or friendship ties. Any and all of these may have an impact on an individual's attitudes and behaviors regarding fetal sex-selection. For example, in Xu's master's thesis she measured how the strength of social ties influence an individual's son preference. Comparing the interaction between an individual and their fathers (who are blood ties) and between an individual and their spouses (who are marital ties), she found that both strengths of tie affect the individual's son preference but in a different direction (Xu, 2010). This study was unusual in that it

looked at the strength of the ties; most studies that include the effects of social ties structure to understand fetal sex-selection focus only on the number of people in an individual's strong or weak social ties. For example, Wu found that among rural-urban migrants son preference is affected by the number of members in a migrants' circle of weak social ties (Wu et al., 2008).

Figure 1 here

In our study we have brought these different approaches together to understand the role of subjective norms in fetal sex-selection. To do this, we studied the relationship between an individuals' SSI during pregnancy and the subjective norms of people within an individual's social ties structure focusing on the strength of the ties rather than the number in any one type of tie (Figure 2).

Figure 2 here

Since sex-selection behavior is hard to measure directly, we used SSI as a proxy for the actual behavior. Thus, SSI during pregnancy is determined primarily by i) an individual's sex preference 's attitude (SPA) towards sex of their fetus, and ii) the subjective norms of sex preference (SNSP) of the groups within an individual's social ties structure whose influence depend on the weight of the tie. Strong ties include: i) blood ties such as parents and siblings; ii) marital ties such as spouse and spouse's parents; and iii) regional ties such as neighbors and villagers. Weak ties include business or friendship ties such as acquaintances or friends. This study also has three important variables: i) SSI during pregnancy, or an individual's behavioral intention for fetal sex-selection; ii) SPA, or an individual's degree of preference for the infant's sex; iii) SNSP, or an individual's perceptions of the surrounding people's (family, friends, and society) degree of preference for the infant's sex.

DATA AND METHODS

Sampling and Survey

Data used in this study are from surveys conducted during December 2009 in three rural areas of SX Province in China. SX province is located in inland China, at the middle reaches of The Yellow River, connecting the east and the west, the south and the north. Due to north-south differences in geology, culture and history, SX is naturally classified into three regions, which are the southern, the middle and the northern SX. Differences in geology and history have led to a distinctive cultural environment in each of the three regions (Bashu, Central Plain and Northern Frontier cultures). In rural China, a 1.5 child policy has been in place since 1984 . This means that if the first child is female, parents are authorized to have a second child; if the first child is male, parents are not authorized to have another child. SX Province is typical of the rest of rural China in that there have been sharp increases in SRB since 1990 with fluctuation around the higher level in SRB since 2000. This region is atypical in that it is the one of the 14 provinces with the highest SRB in China. Data from a sampling survey of 1% of the population reveal that in 2005 SRB in SX was 132.1, the third highest level in China (National Bureau of Statistics of China, 2007).

In this study, three classic rural counties from the southern, the middle and the northern areas were selected for survey. They are: LY County representing the southern area where the uxorilocal marriage is prevalent and the SRB is approaching normal; SM County representing the northern area, where a strong son preference is dominant; and ZZ County representing the middle area, where son preference is in between the previous two selected counties. With the cooperation of local family planning institutions, three townships from each county, five villages from each township, and twenty residents aged from 20 to 60 years old from each village were randomly selected. All participants were interviewed at the township offices with

questionnaires issued and answered on the spot. Each participant received a gift package of a towel, toothpaste and washing powder for participating in the survey. From 908 interviews, 906 valid questionnaires were obtained.

Measurements

Sex-selection intention during pregnancy (SSI). Due to a current rural culture that prefers sons, the objective of fetal sex-selection is usually to achieve the birth of a male (Chu, 2001; Qiao, 2004). Data from the survey, "Rural Residents' Expectations on Family Planning," conducted by the National Population and Family Planning Commission reveal that having both a son and a daughter is the ideal for contemporary residents of rural China when a couple is allowed two children (Mo, 2005). Hence, there exists a possibility that fetal sex-selection could be aimed at getting a daughter. Therefore, two items were proposed for measuring SSI during pregnancy:

Sex-selection intention-son (SSI-S):

If the policy allowed, would you have an induced abortion to obtain a son?

(1) Definitely would (2) Would (3) Not sure (4) Would not (5) Definitely would not

Sex-selection intention-daughter (SSI-D):

If the policy allowed, would you have an induced abortion to obtain a daughter?

(1) Definitely would (2) Would (3) Not sure (4) Would not (5) Definitely would not

Sex preference attitude (SPA). Since the SSI could be for a son or daughter, the SPA accounts for the whether a son or a daughter is preferred. Thus, in this study, SPA has two subscales: sex preference attitude-son (SPA-S) and sex preference attitude-daughter (SPA-D). Given that son preference plays an important role in

economic, cultural and religious areas (Li, 2003; Liu, 2006; Deng, 2008), both SPA-S and SPA-D include economic, cultural and religious dimensions yielding six items (as shown in Table 1). The Alpha internal consistency coefficients of the total scale, subscales and dimensions calculated are all above 0.8, indicating satisfactory reliability; the confirmatory factor analysis on total scale shows good constructive validity as well. Son and daughter preference were measured independently with total scores calculated by adding the score each received as affiliated items. The higher the score, the stronger the preference.

Table 1 here

Subjective norms of sex preference (SNSP). With the measurements above and with SSI and SPA as reference, the measurement on SNSP will include both son and daughter preference (SNSP-S and SNSP-D). Since the social ties structure has four types of ties which are blood, marital, regional, business/friendship and seven groups which are parents, siblings, spouse, spouse's parents, acquaintances/friends, neighbours and villagers, measurements for each of the different groups were assigned their own category:

Group 1:

SNSP-S for parents, spouse or spouse's parents:

If you gave birth to a son, what do you think your parents' (spouse/spouse's parents) attitude would be?

(i) Extremely unhappy (ii) Unhappy (iii) Neither unhappy nor happy (iv) Happy (v) Extremely happy

SNSP-D for parents, spouse or spouse's parents:

If you gave birth to a daughter, what do you think your parents' (spouse/spouse's parents) attitude would be:

(i) Extremely unhappy (ii) Unhappy (iii) Neither unhappy nor happy (iv) Happy (v) Extremely happy

Group 2:

SNSP-S for siblings; neighbours, villagers; acquaintances or friends:

If you gave birth to a son, what do you think your siblings' (neighbours/ villagers/ acquaintances or friends) attitude would be?

(i) Not very envious (ii) Not envious (iii) Neither envious nor unenvious (iv) Envious (v) Very envious

SNSP-D for siblings; neighbours, villagers, acquaintances or friends:

If you gave birth to a daughter, what do you think you're your siblings' (neighbours/ villagers/ acquaintances or friends) attitude would be?

(i) not very envious (ii) Not envious (iii) Neither envious nor not envious (iv) Envious (v) Very envious

This measurement involves seven groups, each with two subscales namely SNSP-S and SNSP-D and thus contains fourteen items. The Alpha internal consistency coefficients calculated on total scale and subscales are all above 0.7; the exploratory factor analysis on this scale indicates a good constructive validity as well. The subjective norms of the seven groups are denoted by the score obtained on each item. The higher the score, the stronger the sex preference (son or daughter) of the social ties group.

Control variables integrated into the analysis include demographic and socio-economic variables such as age, sex, marital status, education and annual income. Since other studies have demonstrated that the sexes of current children are strongly

correlated with an individual's sex preference (Xu, 2010), the sexes of current children are also included as control variables in the analysis.

Data Analysis

In order to validate the framework described for data analysis, the Ordinary Least Square (OLS) regression method was adopted for the four models constructed. Model 1 adopts SSI-S as the dependent variable, the SPA-S and the SNSP-S as the independent variables. Model 2 includes age, sex, marital status, sexes of current children, education, and annual income as control variables, with SSI-S as the dependent variable, the SPA-S and the SNSP-S as the independent variables; Model 3 adopts SSI-D as the dependent variable, the SPA-D and the SNSP-D as the independent variables; Model 4 includes age, sex, marital status, sex of current children, education and annual income as control variables, with SSI-S as the dependent variable, the SPA-S and the SNSP-S as the independent variables as well.

As mentioned previously, data were taken from three different areas with distinct cultures, which might lead to the data having a nested structure. So the Chow test was used to test the differences between samples from the three areas using the regression coefficients obtained from the previous regression analysis. Results of the Chow test elucidate the nested structure and therefore while a hierarchical linear regression method should be used, due to our limited sample size, there is no convergent result. So, to simplify matters, the total of all samples was split into three-area samples, and the above four models were applied independently to the three different samples.

The basic information on variables and the comparison between the three regions is shown in Table 2. In SM County where son preference is strongest SSI-S, SSI-D and SPA-S are significantly higher than that in other two areas. SNSP-S and SNSP-D are significantly higher as well. In LY County where the uxorilocal marriage prevails,

the SSI-S and SSI-D and SPA-S for all groups are the weakest. The values in ZZ county are between those for SM and LY Counties. The distribution of age, sex, marriage, education and income vary quite a bit between the three counties, but there is no apparent difference in the distribution of the sexes of current children.

Table 2 here

RESULTS

As indicated in Table 3, the regression results using model 1 on LY samples show that only the SPA-S of one's spouse and one's spouse's parents are negatively correlated with SSI-S (spouse:-0.17; spouse's parents:-0.23). For ZZ samples, the individuals' SPA-S, SNSP-S of siblings, neighbours and villagers all have positive correlations with SSI-S (individual: 0.12; brothers and sisters: 0.21, neighbours:0.18, villagers 0.15). Furthermore, the SNSP-S of one's spouse and spouse's parents have negative correlations with SSI-S (spouse:-0.27, spouse's parents:-0.32). For SM samples, the individuals' SPA-S have a significant positive correlation with SSI-S (individual: 0.30), and the SNSP-S of the spouse's parents has a significant negative correlation with the SSI-S (spouse's parents: -0.49). The Adjusted R^2 which indicates how well the regression function fits the data, is much higher for SM and ZZ samples (SM:10.8%; ZZ:14.9%) than for LY samples (LY:6.4%).

The regression results of model 2 (which includes control variables such as age, sex, marital status, and the sexes of current children), show that for LY samples, the impact of the SNSP-S of one's spouse on SSI-S is also significant without any obvious difference in the correlation. However, the impact of the spouse's parents' SNSP-S is no longer significant. The sexes of current children have a significant positive correlation with SSI-S. This means that people with a son or both son and daughter are more likely to adopt sex-selection behaviors favoring sons than people

who have no children. It further suggests that the impact of one's spouse's parents' SNSP-S on SSI-S is mediated by control variables such as the sexes of current children. ZZ samples that include control variables show that the impact of SPA-S and most SNSP-S on SSI-S remains significant without changes on the value of the regression coefficients. However the impact of the parents' SNSP-S goes from being insignificant to significant. Of the control variables in ZZ samples, only annual income has a significant impact on SSI-S: people having annual incomes of more than 10000 Yuan are more likely to adopt sex-selection behavior with a preference for sons than those having incomes of less than 4000 Yuan. SM samples with control variables included show that the SPA-S and the SNSP-S of a spouse's parents have a significant impact on SSI-S, without obvious changes on the values of the coefficients. Control variables which include marital status, sex, sex of current children and annual income, all have a significant impact on SSI-S. Married versus unmarried, males versus female, people with annual income more than 10000 Yuan versus those with annual income less than 4000 Yuan, people with no children versus people with only daughters, are all more likely to adopt sex-selection behavior preferring sons. When compared with the R^2 of model 1, the R^2 among LY samples is relatively low; the R^2 among ZZ and SM samples are higher (ZZ:14.4%; SM:18.8%).

Table 3 here

As shown in Table 4, regression results of model 3 for the LY samples reveal that only the SNSP-D of neighbors has a negative correlation with SSI-D at a 10% level of significance (neighbors: -0.25). For the ZZ samples, the SNSP-D of acquaintances or friends has a positive correlation with SSI-D (acquaintances or friends: 0.21). For SM samples, only individual's SPA-D has a positive correlation

with SSI-D (individual: 0.22). For all three-regions, the R^2 are quite low (LY: 0.9%; ZZ: 2.9%; SM: 3.4%).

In model 4, the impact of neighbors' SNSP-D on SSI-D is loosing significance for the LY samples. However, in model 4, the sexes of current children have a significant impact on SSI-D, i.e compared to those without any child people who only have a daughter or who have both a son and a daughter are more likely to adopt sex-selection behaviors that favor a daughter. For ZZ samples, the impact of the parents' SNSP-D on SSI-D moves from insignificant to significant, but with a negative correlation (parents: -0.20), while the impact of acquaintances' and friends' SNSP-D no longer reaches significance. Of the control variables, only sex reaches significance with males more likely than females to adopt sex-selection behaviors favoring daughters. For SM samples, the impact of a person's SPA-D on SSI-D no longer reaches significance, while the impact of the parents' SNSP-D increases in significance with the coefficient increasing in same direction. Concurrently, the effect of the spouse's SNSP-D approaches significance but with a negative correlation (spouse: -0.18). Of the control variables, only age, education and annual income are significant. People who were born between 1970-1979 as opposed to those who were born after 1980, people with junior high school education level as opposed to those with less education and people with annual income more than 10,000 Yuan as opposed to those with annual income less than 4,000 Yuan are more likely to have sex-selection behavior favoring a daughter. With the control variables included, the adjusted R^2s among LY and SM samples for model 4 decrease (LY: 3%; ZZ: 7%) with LY samples increasing slightly but still very low (LY: 6.7%).

Table 4 here

DISCUSSION

Using data from three demographically distinct regions in China we have modeled the likelihood of fetal sex-selection using the Theory of Reasoned Action in combination with the concepts of Behavioral Intention and Chaxugeju. What is new in the current study is: i) we compared three different rural regions allowing a comparison of sex preference cultures, income levels, and education levels; and ii) we developed a measurement of the relative strength of social ties and not just the number of a given type of tie. Together these have allowed us to understand not just who plays a role in SSI but also who is likely to engage in SSI as well as the whether they will select for sons.

Our primary finding is that regression results obtained from regions with a strong culture of son-preference are statistically highly significant. This suggests that the fetal sex-selection is indeed a process of reasoned decision-making involving rational actors. A second important finding is that the TRA model is more suitable for explaining SSI-S than SSI-D in that the adjusted R^2s obtained were greater for son-preference than for daughter-preference and SSI-D could not be completely explained by SPA-D and the SNSP-D of the groups in the individual's social ties structure. This may be because while there exists sex-selection behavior that favors daughters, sex-selection behavior that favors sons is dominant (Chi, 2006). It may also be the case that more environmental factors go into daughter-preference behavior, such as family background, child-rearing norms, etc. Interestingly we did find that sex and annual income as a proxy of social-economic status (SES) played a role in a sex preference for daughters with males more likely than females and families with higher annual incomes more likely than those with lower annual incomes. Given the greater strength of the TRA model for elucidating son-preference, subsequent discussion will focus

primarily on SSI-S in ZZ and SM, skipping over analyses of SSI-D and data from LY since this is a region in which the SRB is normal.

We found from our analysis of data from ZZ and SM that SSI-S is determined by SPA-S, namely the stronger the SPA is for a son, the more likely will be the intention to select for a son. This finding supports many other more general studies of the relationship between attitudes and behavioral intention. For example, a Korean study showed that the attitudes of clients toward health services influenced their intention to use health services (Choi et al., 2004). An American study showed that attitudes toward laws that protect property rights predicted behavioral intentions toward the purchase of fake products (Cordel et al.,1996). As well, Jeonga and Lambert's study reveals a strong correlation between the attitudes about hotel reservations and the behavioral intention to make hotel reservation (Jeonga & Lambertb,2001).

We also found that the SNSP-S of any of the members in an individual's social ties structure will have a significant impact on SSI-S but in different directions depending on the strength of the social ties. For example, the SNSP-S of parents and siblings, all of whom are connected by blood ties, has a positive impact on SSI-S. In other words, the stronger the perception that one's parents or siblings have a son preference, the more likely will an individual be to adopt sex-selection behavior favoring sons. Conversely, the SNSP-S of the spouse and the spouse' parents, all of whom are connected by marital ties, correlate negatively with sex-selection behavior favoring sons. In other words, the more strongly an individual perceives that their spouse or spouse's parents' favor a son, the less likely they will adopt behavior favoring a son. These results are so strong that they are observed in all three regions with the finding most pronounced in males who favor sons.

Taken together, these data suggest that although parents, siblings, spouse and spouse's parents represent strong social ties, the impact of blood ties differs from that of marital ties. This supports Xu's findings that among people of child bearing age in urban regions the more interactions an individual (male or female) had with their father (blood tie), the more strongly they favored sons. Conversely, the more interactions an individual had with their spouse, the less strongly they favored sons (Xu, 2010). This suggests that it is not sufficient to think only in terms of strong or weak ties but that the nature of the ties within the category is important. One possible explanation is that in a person's subjective cognition, blood ties are the 'real' strong ties. This is supported by Chinese expressions like (as translated): "one of us," "one of family," and the "community interest" that represents family of origin and expressions like: "outsiders" used to describe one's marital ties. Another possible explanation is that there is a 'conflict' with or 'reverse' psychology with respect to the "outsider's" sex preference.

Other studies highlight the tension between marital and blood ties; in rural China marital and blood ties accrue different economic benefits from communal property leading to competition for resources between the two types of tie (Yang et al., 1999; Zhang, 2003). It is often the case that in traditional agricultural societies with a patrilineal system blood social ties will prevail; with social and economic transition of these societies to an industrial and modern society, marital social ties become more and more important for the allocation on all kind of resources and increases the liklihood of 'negotiating' views (Yang, 2006).

With respect to regional strong ties, the SNSP-S of neighbors and villagers were correlated positively with SSI-S. With respect to weak ties, the SNSP-S of acquaintances or friends was correlated negatively with SSI-S. This finding is in

contrast with Xu's study in which she showed that in urban dwellers of child bearing years, strong but not weak ties are correlated with individual's son preference (Xu, 2010). However, our finding is similar to Wu's who also found that weak ties too influence individual's son preference (Xu, 2010; Wu et al., 2008) and the difference may be due to a rural vs. urban dwellers.

We found that in addition to attitudes and subjective norms, the sex of current children is correlated strongly with SSI-S. This supports Xu's finding that son preference is strongest among those who already have sons, less strong among those who do not have any children, and weakest among those who have daughters (Xu, 2006),

Data from SM suggests that education and annual income are both correlated strongly with SSI-S. Those with a junior high education and those whose annual income was more than 10,000 Yuan are more likely to have SSI-S than those with less education and income. This is surprising because it suggests that in rural areas more education and more income will actually reinforce the traditional behavior of favoring the birth of sons. One possibility is that the culture of SM overrides education or income. As a region, SM has the strongest preference for sons of any of the three areas studied. This supports other studies from China, South Korea, and Taiwan demonstrating that in areas where son preference is very strong, economic and social development doesn't reverse it but rather, materially aids its realization so that son preference becomes stronger (Yang et al., 2009; 2010).

CONCLUSIONS

The TRA model can be used to explain SSI-S in areas where son preference is strong but not in areas where son preference is weak or the preference is for daughters. An individual's SPA-S is the determining factor of SSI-S during pregnancy. People with

stronger SPA-S are more likely to manifest sex-selection behavior favoring sons. The model predicts that the stronger a region's culture of son preference, the more likely will be SSI-S, even when education and income levels are high. In rural areas the SNSP-S of an individual's social ties structure has a significant impact on SSI-S, but these effects differ depending on strong or weak social ties and within strong ties, whether they are strong ties of blood or of marriage.

Policy Implications

We have shown that regardless of education or income that traditional cultures favoring sons is a fundamental determinant for fetal sex-selection. Given this, the role that culture plays must be attended to. As well, since the social ties structure is important, especially the role of strong, blood ties, social strategies that strengthen spousal marital ties may lead to a disintegration of son preference in rural areas. These findings have important policy implications for SRB governance.

At the macro-level, national governments have promulgated a series of benefit-oriented policies that are beneficial to girls and only-daughter families. While these have achieved some parity for girl children, the impact of these macro-level policies on traditional culture are still very limited, especially in the short-term. The results of this study demonstrate that the traditional culture favoring sons is deeply rooted in rural regions in which strong social ties, especially those of blood, form the structure of that society.

Change will come at the micro-level by affecting and modifying unconsciously and progressively individuals, families and villages by means of community-based participatory intervention. New and diverse relationships within families and marriages should be developed. For example, uxorilocal marriage should be supported; means of support in old age other than the son need to be developed; the impacts and

constraints of strong social ties need to be weakened and shifted toward strengthening marital ties. To do this will require community-based participatory interventions into traditional culture and these should be conducted with support from academic groups and non-governmental organizations. For example, the "group discussions of mothers-in-law" held by Juchao County of Anhui Province and "the revisions on village's regulations with gender equality perspective," conducted by Zhoukou City in Henan province are examples of successful micro-level attempts at culture change.

Study Limitations

There are limitations to our study. Although the total sample size is 906 interviews overall, the three regions chosen had great cultural differences, data are nested, and there are some missing data points. While we dealt statistically with missing data, we view the fact that our regions are culturally diverse as a key benefit of our study design. Much was learned in comparison even though data from the LY region proved sufficiently different as to not allow us to use those numbers in the total data set. Given that, it is unlikely that we would have been able to conduct an even larger study with more regions.

Second, the model, itself, has limitations given the legal reality in China. The hypothesis proposed in this study is that the act of fetal sex-selection is a reasoned action. However, this overlooks the input from social conditions beyond the individual's control. The theory of Planned Behavior takes the individual's perception of their own control into account. Thus, future studies should not only enhance the data quality and increase the sample size, but should also measure perceived control in order to better understand the role that current government policy plays in the psychological aspects of decision-making around prenatal sex selection behavior.

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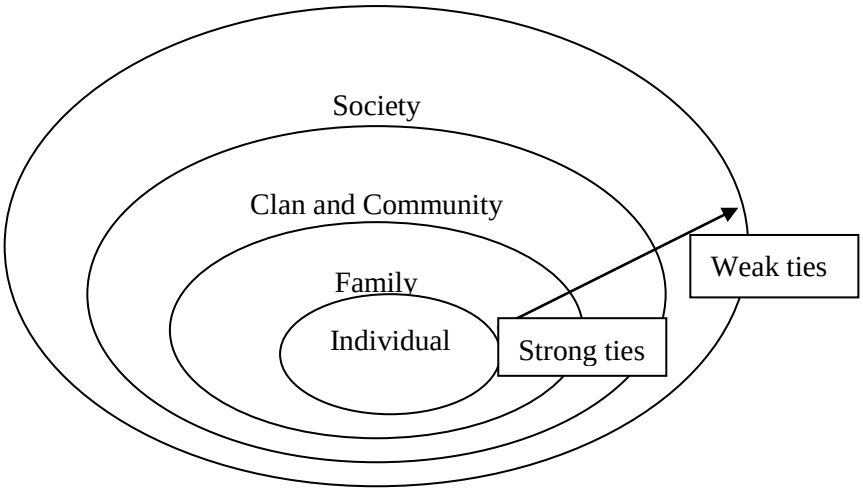

Figure 1 Chaxugeju in rural society of China

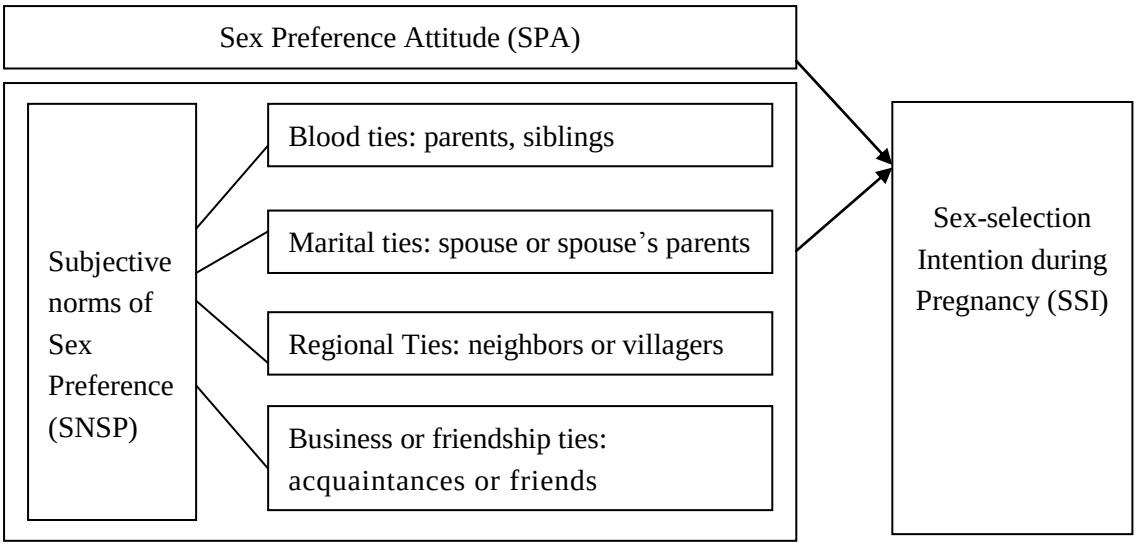

Figure 2 Research Framework (the TRA model for Sex-selection Intention during pregnancy)

Table 1 The Sex Preference Attitudes Scale (SPA)

Son preference attitude (SPA-S)	
Son's economic role	S1. Son can provide parents with aging support.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	S2. Son can provide family with economic support.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
Son's cultural role	S3. Son can make psychological comfort to parents.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	S4. Son can make pride to parents in society.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
Son's religious role	S5. Son can continue the family to the next generation.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	S6. Son can continue parent's life.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
Daughter preference attitude (SPA-D)	
Daughter's economic role	D1. Daughter can provide parents with aging support.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	D2. Daughter can provide family with economic support.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
Daughter's cultural role	D3. Daughter can make psychological comfort to parents.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	D4. Daughter can make pride to parents in society.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
Daughter's religious role	D5. Daughter can continue the family to the next generation.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree
	D6. Daughter can continue parent's life.
	(1) strongly agree (2) agree (3) neither agree nor disagree (4) disagree (5) strongly disagree

Table2 the Comparison Analysis among the Three-area Samples

		LY		ZZ		SM	
		Mean	SD.	Mean	SD.	Mean	SD.
	SSI-S	1.80	0.67	2.00	0.85	2.87	1.35
	F test (three-area samples)			F=73.17(p=0.000)			
	SSI-D	1.82	0.75	1.94	0.68	2.66	1.26
	F test (three-area samples)			F=50.20(p=0.000)			
	SPA-S	16.71	5.79	17.99	5.79	19.50	6.46
	F test (three-area samples)			F=15.28(p=0.000)			
	SPA-D	16.93	6.37	16.87	5.81	16.47	6.61
	F test (three-area samples)			F=0.46(p=0.63)			
SNSP-S	Parents	3.31	1.38	3.60	1.40	3.75	1.53
	F test (three-area samples)			F=6.97(p=0.001)			
	Brothers and sisters	3.16	1.02	3.19	1.06	3.48	1.22
	F test (three-area samples)			F=7.52(p=0.001)			
	Spouse	3.34	1.77	3.43	1.27	3.82	1.37
	F test (three-area samples)			F=11.35(p=0.000)			
	Spouse’s parents	3.36	1.44	3.49	1.51	3.80	1.54
	F test (three-area samples)			F=6.61(p=0.001)			
	Acquaintances or friends	3.09	1.20	3.06	1.26	3.35	1.36
	F test (three-area samples)			F=4.91(p=0.008)			
	Neighbours	3.13	1.21	3.12	1.33	3.35	1.36
	F test (three-area samples)			F=3.38(p=0.034)			
	Villagers	3.07	1.16	3.05	1.17	3.22	1.37
	F test (three-area samples)			F=1.65(p=0.193)			
SNSP-D	Parents	2.43	1.09	2.62	1.13	2.61	1.19
	F test (three-area samples)			F=2.53(p=0.08)			
	Brothers and sisters	3.14	0.78	2.89	0.93	2.92	0.93
	F test (three-area samples)			F=6.57(p=0.001)			
	Spouse	2.49	0.86	2.55	0.96	2.51	1.06
	F test (three-area samples)			F=0.32(p=0.73)			
	Spouse’s parents	2.51	1.24	2.77	1.25	2.53	1.18
	F test (three-area samples)			F=4.29(0.014)			
	Acquaintances or friends	2.89	1.09	2.83	1.00	2.76	1.00
	F test (three-area samples)			F=1.03(0.36)			
	Neighbours	2.84	1.07	2.80	0.99	2.75	1.00
	F test (three-area samples)			F=0.59(p=0.56)			
	Villagers	2.80	1.13	2.63	1.03	2.69	1.02
	F test (three-area samples)			F=1.89(p=0.15)			

To be continued

		N	Ratio	N	Ratio	N	Ratio
Age	Born after 1980	42	16.4%	47	14.4%	108	38.6%
	Born during 1970-1979	134	52.3%	155	47.4%	112	40.0%
	Born before 1969	80	31.3%	125	38.2%	60	21.4%
	X^2 test (Age)			X2=63.65(p=0.000)			
Sex	Female	163	61.3%	228	67.7%	103	35.2%
	Male	103	38.7%	109	32.3%	190	64.8%
	X^2 test (sex)			X2=6.52(p=0.000)			
Marital Status	Unmarried	21	8.8%	11	3.5%	14	4.9%
	Married	219	91.3%	303	96.5%	273	95.1%
	X^2 test (Marital Status)			X2=1.84(p=0.066)			
Sexes of Children	No child	14	5.2%	14	4.1%	29	9.6%
	Only having daughter	83	31.1%	51	15.1%	71	23.6%
	Having both son and Daughter	66	24.7%	163	48.2%	61	20.3%
	Only having son	104	39.0%	110	32.5%	140	46.5%
	X^2 test (Sex of children)			X2=0.75(p=0.45)			
Education	Primary school and below	115	43.7%	38	11.7%	54	18.8%
	Junior high school	104	39.5%	159	48.5%	96	33.4%
	Senior high school	44	16.8%	131	39.9%	138	47.9%
	X^2 test (education)			X2=8.90 (p=0.000)			
Annual Income	No more than 4000 Yuan	185	70.1%	165	49.4%	72	25.7%
	4000-9999 Yuan	42	15.9%	74	22.2%	33	11.8%
	Above 10000 Yuan	37	14.0%	95	28.4%	175	62.5%
	X^2 test (Annual income)			X2=13.16(p=0.000)			

Table 3 Determinants of SSI-S

Dependent variables (SSI-S)	LY		ZZ		SM	
Independent variables	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
SPA-S	0.10	-0.01	0.12^{+}	0.14^{+}	0.30***	0.27***
SNSP-S						
Parents	0.20	0.14	0.14	0.28*	0.22	0.19
Brothers and sisters	0.09	0.13	0.21*	0.21^{+}	0.13	0.08
Spouse	-0.17*	-0.22*	-0.27**	-0.36**	0.05	0.10
Spouse's parents	-0.23^{+}	-0.19	-0.16	-0.17	-0.49**	-0.40*
Acquaintances and friends	-0.08	-0.09	-0.32***	-0.30**	0.002	0.01
Neighbors	0.03	0.14	0.18*	0.24**	0.20	0.16
Villagers	0.08	0.03	0.15^{+}	0.03	-0.07	-0.10
Control variables						
Age (Reference: born after 1980)						
Born during 1970-1979		0.03		0.11		-0.05
Born before 1969		-0.07		0.004		0.12
Sex (reference: female)						
Male		-0.07		-0.02		0.17^{+}
Marital Status (reference: unmarried)						
Married		-0.07		-0.05		0.13^{+}
Sexes of children (reference: no child)						
Only having daughter		0.12		0.02		-0.28**
Having both daughter and son		0.18*		0.06		-0.09
Only having son		0.19*		-0.06		0.01
Education (reference: primary school and below)						
Junior high school		0.09		0.09		0.12
Senior high school		-0.01		-0.09		-0.14
Annual income (reference: less than 4000Yuan)						
4000-9999 Yuan		0.01		-0.03		0.14
More than 10000 Yuan		0.11		0.14^{+}		0.21*
df	8	19	8	19	8	19
Adjusted R^2	0.064	0.067	0.108	0.144	0.149	0.188
F	1.86^{+}	1.75*	4.63***	2.90***	5.78***	3.30***

Note: $^{+}$p<0.1, *p<0.05, **p<0.01, ***p<0.001.

Table 4 the Determinants on SSI-D

Dependent variables (SSI-D)	LY		ZZ		SM	
Independent variables	Model 3	Model 4	Model 3	Model 4	Model 3	Model 4
SPA-D						
	0.04	-0.02	0.01	0.005	0.22**	0.13
SNSP-D						
Parents	0.06	0.13	-0.12	-0.20+	0.24+	0.42**
Brothers and sisters	0.11	0.04	-0.01	-0.06	-0.002	0.02
Spouse	0.05	0.04	0.05	0.10	-0.07	-0.18+
Spouse's parents	0.02	0.02	-0.08	-0.06	-0.14	-0.21
Acquaintances and friends	0.16	0.14	0.21*	0.19	-0.05	-0.19
Neighbours	-0.25+	-0.24	0.06	0.04	-0.09	-0.03
Villagers	0.13	0.09	-0.10	-0.06	0.03	0.10
Control variables						
Age (Reference: born after 1980						
Born during 1970-1979		-0.05		0.04		0.17+
Born before 1969		0.04		0.12		0.12
Sex (reference: female)						
Male		-0.04		0.27**		-0.07
Marital Status (reference: unmarried)						
Married		0.05		-0.04		0.15
Sexes of children (reference: no child)						
Only having daughter		0.16+		-0.08		-0.10
Having both daughter and son		0.18*		0.02		-0.17
Only having son		0.09		-0.09		-0.03
Education (reference: primary school and below)						
Junior high school		-0.03		0.06		0.23*
Senior high school		-0.03		-0.05		-0.04
Annual income (reference: less than 4000Yuan)						
4000-9999 Yuan		0.07		-0.09		0.10
More than 10000 Yuan		0.14		-0.06		0.17+
df	8	19	8	19	8	19
Adjusted R^2	0.009	0.003	0.029	0.07	0.034	0.067
F	1.255	1.035+	1.876+	1.818*	1.899+	1.656*

Note: +p<0.1, *p<0.05, **p<0.01, ***p<0.001.