Preferred Sons are "Rotten:" Giving to One's Parents in the Lab in China *

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Abstract

In China, many elderly parents rely on their adult children for support, despite the introduction of state pension programs. In addition, parents generally have a very strong preference for sons, as sons (not daughters) are expected to support them in old age. While the Han majority have a strong preference for sons, there are four ethnic minority groups in China with gender-neutral preferences. In this paper, we compare decisions made in lab experiments by men and women from these four ethnic groups to those who are from minority ethnic groups with gender bias. We explore differences in sharing with one's parents when playing modified dictator games in the lab. We find that men and women have different preferences for sharing with their own parents, and that these differences are particularly pronounced among families with a preference for sons. Among those with gender bias, men give parents less than women do. Among those without gender bias, men and women give similarly to parents. In addition, gender-neutral men give parents more than gender-biased men do. Results are robust to controlling for observed differences across gender and ethnicities. These findings underscore the importance of mitigating son preference in China and providing public transfers to parents of only sons.

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1 Introduction

Many low and middle income countries face a growing aging population. This demographic shift has prompted many countries to introduce public pension systems. For example, in China, the government has been experimenting with various social pension systems since the 1950's, with significant reforms affecting broad swaths of the population - first in 2009, with the introduction of the New Rural Social Pension (NRSP), and then in 2014, with the merging of this rural system with the Urban Resident Social Pension (URSP) (Zhu and Walker 2018).

The net welfare benefits to recipients of public social assistance and social insurance programs depend crucially on how private transfers would respond to such new programs. Adult children would give less to parents who receive a pension and are less in need of their help if they help their aging parents because of altruism. The introduction of public transfer systems such as public pensions would then "crowd out" private transfers from adult children to their parents. In this way, children would "undo" forced public transfers such as public pensions, the result being that such programs have no ultimate impact on parents' well-being. On the other hand, if adult children give support to parents for strategic or exchange-motivated reasons, then they may increase financial transfers to parents in response to a new public pension system. Children might provide transfers to their parents in exchange for assistance in child care (Secondi 1997). Parents who receive a new pension may then want to reduce their assistance in child care, as they would become less in need of such payments. Adult children would need to increase payments to parents for taking care of grandchildren (Cox 1987). As the welfare implications of such public pension systems depend crucially on motives behind private transfers, many economists have sought to explain the motivations for intergenerational transfers (e.g., Bernheim, Shleifer, and Summers 1985; Cox 1987; Cai, Giles, and Meng 2006; Kazianga 2006).

Researchers can rule out altruistic motives for giving transfers if they find transfers to be positively related to income. But these approaches cannot identify direct evidence of altruism. One reason for this is because selfish children could be induced to behave as altruists might - that is, in the interests of their family - if an altruistic parent can punish them for selfish behavior (Becker

1974, 1981). This so-called "Rotten Kid Theorem" would imply that it would be difficult to distinguish between such "rotten kids" from altruists. In addition, it is not clear how parents could induce such behavior. In lab experiments, parents could not induce their young children to behave in the interests of the family (Peters et al. 2004). Parents might induce adult children to behave altruistically by instilling them with a sense of guilt, by providing investments in schooling and other inputs into human capital production throughout childhood (Becker 1993; Becker, Murphy, Spenkuch 2016).

One potential concern is that such investments in childhood might backfire on parents who might "spoil" their children so much so that they cannot induce altruistic behavior and corresponding support once their children reach adulthood. In China, this issue is particularly salient, as many families invest heavily in their sons and not nearly as much in their daughters. Such differential devotion of family resources to sons and daughters is a consequence of a strong cultural preference for sons.

This article explores whether adult children exhibit different levels of generosity towards their own parents depending on their gender and whether or not they are from a culture where there is a strong preference for sons. While the Han majority in China have a strong preference for sons, four ethnic minority groups have been identified as "gender neutral" without any preference for sons (Arnold and Liu 1986; Das Gupta et al. 2003; Chen and Chen 2004; Mu and Zhang 2011). We recruit participants in our lab experiments who are college students belonging to these minority groups. To compare their behavior with those from "gender biased" families with son preference, we also recruit participants primarily from other "gender neutral" ethnic minority groups. In doing so, we compare observed differences in behavior in the lab both between "preferred" sons and daughters from gender biased ethnic groups, and between sons and daughters from gender neutral ethnic groups.

Participants play a series of modified dictator games with their own parents, where we vary the following factors for each participant (i.e., within subject variation): the relative cost of giving to parents, the available endowment for sharing with parents; as well as the amount of information

parents receive about one's decisions in the lab. Similar games have been played in a variety of different contexts to elicit individual preferences either between two different goods, or between giving to another person and keeping payments for one's self (Sippel 1997; Mattei 2000; Harbaugh et al. 2001; Andreoni and Miller 2002; Fisman et al. 2007; List and Millimet 2008; Porter and Adams 2016).

By varying the relative cost of giving and endowments, we can apply revealed preference theory to test for rational behavior and to characterize specific preferences for giving to parents. Children can be either selfish or selfless towards parents, giving nothing or everything to parents. Alternatively, they can share equally with parents if they have Leontief preferences. They can also maximize payouts between themselves and parents, keeping payments for themselves when the cost of giving is high, and giving all payments to parents when the cost of doing so is low. They could then "undo" these decisions in subsequent interactions with parents.

We also varied the ease with which participants could undo their decisions once outside the lab, by varying the information parents received about the decisions made in the lab. In some games, parents receive a payment from us, noting only that their child participated in a research study that may have resulted in a payment to them; in other games, parents receive a letter outlining the experiments with detailed instructions, as well as all of the decisions their children made in these games and resulting payouts to themselves and to their children. As it would be difficult to explain the games to parents in the no information treatment, participants would be less able to undo their decisions outside the lab, particularly compared to those in the full information treatment. In addition, since decisions in the no information treatment could be kept hidden from parents, any generosity exhibited in these games could be attributed to altruistic motives for sharing with parents. In contrast, those in the full information treatment may be motivated to share with parents for strategic reasons.

Finally, we compare how participants play these games with parents with how they do so with strangers who remain anonymous. This enables us to distinguish between general tendencies for sharing with others as opposed to sharing specifically with one's own parents.

We find that among gender biased ethnicities, compared to women, men are more selfish towards parents who receive no information. Compared to gender neutral men, gender biased men are more selfish towards parents who receive no information. These differences do not exist in the full information case. Among those without gender bias, men and women give similarly to parents. These results are found in both the revealed preference analysis, as well as in estimates of multivariate regression models on individual shares given to recipients. The latter results are also robust to including a broad set of covariates which control for observable differences across ethnic groups and gender.

These findings have potentially important policy implications. China's One Child Policy, combined with a preference for sons, led many parents who were restricted to having no more than one child to give birth to a son. Our findings indicate that the prevalence of only sons in China would imply a need for the state to provide support to elderly parents of only sons, particularly as those affected by the One Child Policy grow older. Our findings also underscore the need to address the underlying reasons for son preference. Son preference has been mitigated by education, mechanization of agricultural production, and increased work opportunities for women (Murphy et al. 2011). Such changes need to continue to develop further in China. Any policies or programs promoting further mechanization of agricultural production, education, as well as employment opportunities for women can further reduce this preference for sons, thereby encouraging parents to have boys and girls, and have both sons and daughters provide them with support in old age.

Our paper contributes to a nascent literature exploring family dynamics and decisions in the lab, by recruiting participants from a very unique and understudied population of ethnic minorities in China. Two other closely related studies have employed lab experiments involving parents and children, but in very different contexts and populations. We also differ from these studies in the way we vary information sharing between parents and children. Peters et al. (2004) have young children ages 8 to 12 play public goods games with their parents, and parents and children are encouraged to communicate while making decisions. Porter and Adams (2016) employ the same games as those used here, but for a highly educated population in England. They also vary whether parents are

informed of their children's decisions, but this information treatment varies across subjects. In contrast, we vary this information treatment within subjects, so that we can distinguish potential differences in information effects for each subject.

Finally, our study design departs from another related experimental study employing lab experiments in China, in which they found that the One Child Policy policy has produced only children who are "less trusting, less trustworthy, more risk averse, less competitive, more pessimistic, and less conscientious individuals" (Cameron et al. 2013). These findings do not help us to understand how such children would behave towards their parents. In contrast, we have participants play dictator games with their own parents rather than only with strangers, and we vary endowments and prices of giving to identify underlying preferences for giving. This approach contrasts with Cameron et al. (2013), who had study participants play a simple dictator game, as well as trust, risk, and competition games. Their study sample was also quite different from ours, as they recruited participants to ensure a balanced sample across men and women born before and after the One Child Policy.

The remainder of our paper proceeds as follows: section 2 provides background on son preference in China; section 3 outlines the experimental design and procedures; section 4 summarizes characteristics of participants; section 5 summarizes the revealed preference analysis; section 6 summarizes additional regression analysis; section 7 outlines the results; and section 8 concludes.

2 Son Preference in China

In 1979, China introduced the One Child Policy, in which parents were restricted to having no more than one child. A major and well-documented consequence of the One Child Policy has been a prevalence of births of sons relative to daughters, resulting in high sex ratios at birth (see for example Das Gupta et al. 2003, Mu and Zhang 2011 for additional references). While average sex ratios are generally maintained around 103 to 105 boys born per 100 girls born, in many parts of China, sex ratios have been 107 or even higher (Coale and Banister 1994). Such high sex ratios are due to a combination of restrictions on the number of children allowed per couple, as well as a

strong preference for sons.

Such a preference for sons is primarily due to a rigid patrilineal system, where all land is inherited by sons only. Because of this system of inheritance, men have historically tended to remain living in the villages where they were born, whereas women would marry outside their villages (Das Gupta et al. 2003). As a result, parents would rely on their sons for long-term care as they age (Kadoya and Khan 2017). Thus, son preference has become inherent to patrilineal social networks, family systems, and sociocultural practices (Murphy et al. 2011). Although women's status increases with age, it is highly dependent on their sons (Das Gupta et al. 2003).

Having a son is seen as a financial safety mechanism. In comparison to parents with sons, parents without sons are more likely to participate in voluntary pension programs and have a higher amount of savings specifically intended for old-age support (Ebenstein and Leung 2010).

However, a number of studies have found that daughters provide greater support and care for their parents compared to sons. In urban China, daughters provide more financial support than sons (Xie and Zhu 2009). Daughters are more beneficial to parents when it comes to maintaining cognitive capacity and reducing mortality risk, particularly among octogenarians or even older parents. These differences are also more pronounced in rural areas, even though son preference is usually stronger in these areas (Zeng et al. 2016a). In comparison to elderly parents with sons, those with daughters are more satisfied with the care they receive, and enjoy greater filial piety and better relationships with their daughters (Zeng et al. 2016b). Such filial piety, as perceived by parents, is positively related to children's provision of financial support (Luo and Zhan 2011).

In addition, elderly parents who took care of grandchildren had a more positive evaluation of filial piety than those who did not do so (Luo and Zhan 2011). When parents provided such childcare, both sons and daughters increased financial assistance and emotional support to parents. However, daughters were more responsive compared to sons, and sons increased emotional support only when parents were providing childcare (Cong and Silverstein 2014). If parents provide childcare, they are also more likely to live with their married children (Zhang et al. 2014).

3 Experimental Design and Procedures

3.1 Gender Neutral vs. Gender Biased Ethnic Groups

In this paper, we are interested in identifying potential differences in motivations for giving to parents when comparing sons and daughters in China across ethnic groups which differ in whether there is a strong social or cultural norm of preferring sons over daughters. In China, the Han majority have a strong preference for sons and make up roughly 93% of China's total population. However, there are several ethnic minority groups which do not exhibit such son preference or gender bias.

Mu and Zhang (2011) identify four gender neutral ethnic groups without son preference: (1) Uyghur or Turkic people live mainly in Xinjiang province in the northwestern part of China; (2) Tibetans live not only in Tibet, but also in Gansu in the northwest and Sichuan in the southwest; (3) Bai people live primarily in the southern province of Yunnan; and (4) Dai or Tai people also live in Yunnan province.

The authors identify these four groups as being gender neutral by first restricting their attention to 19 of China's 56 ethnic groups, whose individual populations are each greater than 1 million people in China's 2000 census. Since average sex ratios range between 103 and 106 boys born per 100 girls (Coale and Banister 1994), Mu and Zhang (2011) identify high sex ratios to be greater than 106. They also restrict their attention to sex ratios at second births, because sex-selective abortion generally occurs in the second birth, and because many minorities have been permitted to have two children at a maximum. Thus, a minority group is defined to be gender neutral if the sex ratio at second birth is less than 106, and gender biased if this sex ratio is 106 or greater. This definition is robust to moving the cutoff point to a ratio of 107. The authors then use these definitions to identify gender selection in China's Great Famine.

Other studies have similarly identified these four ethnic groups to be gender neutral. For example, Das Gupta et al. (2003) finds gender neutral social norms among Tibetan and Islamic ethnic groups (mainly Hui and Uygur), as well as ethnic groups bordering with Burma and Thailand,

such as Dai. Tibetans have also been identified as gender neutral by Arnold and Liu (1986) and Chen and Chen (2004). The latter also identify the Uyghur and Dai groups as gender neutral.

Following Mu and Zhang (2011), we stratify our study sample across the two categories of gender neutral and gender biased ethnic groups they identify. We do so by recruiting subjects from two universities in China which tend to have more students with an ethnic minority background compared to other universities. We recruit subjects from Minzu University in Beijing, and Southwest Minzu University in Chengdu, the capital city of Sichuan Province in southwestern China.

Nearly 40% of our study participants are from a gender neutral ethnic group, as shown in Figure 1. Tibetans comprise nearly 25% of our sample, Uyghur nearly 10%, Bai over 5%, and the remaining gender neutral respondents are Dai. Our recruitment strategy is also successful in recruiting subjects from non-Han ethnic minority groups where son preference predominates. Keeping in mind that 93% of China's population are Han, with other ethnic groups individually comprising only 1% of the population or less; in our study, less than 25% of our participants are Han, with several other populous minorities each comprising nearly 5% of our sample (e.g., Hui, Tujia, Yi, Miao).

In comparison to gender neutral minorities, the gender biased minority groups identified here come from many of the same provinces or neighboring provinces. Hui live primarily in Gansu and neighboring Ningxia. Tujia live in the Wuling Mountains, near the borders of Hunan, Hubei, Guizhou, and Chongqing. These provinces also border Sichuan and Yunnan provinces, where Tibetans, Dai and Bai people live. Yi people live in rural Sichuan, Yunnan, Guizhou and Guangxi. Finally, Miao people live in Guizhou, Hunan, Yunnan, Sichuan, Guangxi, Hubei, and Guangdong provinces.

[FIGURE 1 HERE]

3.2 Recruitment Procedures

In addition to our emphasis on recruiting ethnic minorities, we had a few other requirements for participation in our study. We required that participants be over 18 years of age, and live independently from their parents. That is, subjects needed to have a non-coresiding biological parent

living in rural China. We also required participants to be full-time students enrolled at one of the two universities where we recruited. We excluded those majoring in economics. We also highlighted that priority would be given to minorities (especially Uygur, Tibetan, Dai and Bai people), in order to ensure we recruit subjects from gender neutral ethnic groups.

We started our recruitment a month before the experiment dates. During the recruitment process, subjects had been told that they would play games in which they could earn some money for themselves and their parents, and that these games would be conducted by researchers from the National School of Development at Peking University.

We also designed a recruiting system using the mobile application Wechat. Doing so facilitated collection of personal information of our potential subjects such as age, college major, year in the university, whether their residence permit (called a hukou) allowed them to live in urban or rural China, their ethnicity, time availability, and their contact information. Once the subject was successfully selected for our experiment, we notified him or her by sending a brief message via Wechat. We also reminded each subject twice before the experiment dates, to further encourage each participant to attend the experiment at the designated time.

All recruited subjects were invited to come to one of several identical lecture rooms in either Southwest Minzu University or Minzu University. The experiments were conducted in large lecture rooms, to ensure that participants were seated separately with enough space in between one another so that they would not interfere with each other.

Our experiments were conducted by using mobile phones. All subjects were asked to bring their own mobile phones with enough battery power. During the experiment, QR codes which link to game task questions and the survey questionnaire were provided by experimenters. Subjects could begin the series of questions by scanning the QR code of that particular task. QR codes were shown on a big screen and released one at a time. Once everyone finished a particular task, the QR code for the next task was released.

3.3 Modified Dictator Games

In our experiment, participants played a series of related dictator games, but we varied the endowment amount, or amount available to them for division, and the relative price of giving to a designated recipient. For example, in one dictator game, participants were given 60 tokens and they were told that each token kept for themselves would earn them 1 RMB (Chinese Yuan) and each token given to the recipient would earn the recipient 2 RMB. They could give any amount of tokens ranging between 0 and 60 tokens. In this example, the relative price of giving is 0.50 RMB. Since in this example, tokens are valued at a higher rate when shared with the recipient, the cost of sharing is relatively low. This relative price of giving varied between 0.25 RMB and 4 RMB. Participants played a total of 11 different dictator games with each recipient (see Table 1). The number of tokens allocated in each game varied between 40 and 100 tokens. In four of the 11 games, the relative cost of giving was low or less than one, and in three of the 11 games the relative cost of giving was high or greater than one. In the remaining three games, tokens given or shared were equally valued at 1 RMB, as in typical dictator games. The order in which these games were displayed to each participant was randomized across respondents.

[TABLE 1 HERE]

3.4 Information Treatment

Participants played three sets of these 11 dictator games, or 33 games in total. They were told at the start of the experiment that only one of these 33 games would be carried out, to determine their payment for participation in the experiment and any payments to their parents. This game was randomly selected for each participant at the end of the session, after they had completed all questions related to the lab experiment and survey.

Subjects played three sets of games, where the recipient was either a parent or stranger. In one set of games the recipient was another subject in the room who remained anonymous (A). By comparing decisions made in these games to those made with parents as recipients, we can

determine whether subjects are more generous towards their parents in comparison to strangers who would not reciprocate after the game. In comparison to friends or siblings, there is relatively more uniformity across respondents with respect to their relationships with their parents. Parents are also not chosen by individuals as friends or spouses are.

In the remaining two sets of games, the recipient was the subject's elderly parent(s). These two sets of games involving parents varied in terms of the amount of information parents received about their child's decisions. In one set of games, the parent was not given any information about the details of the game (B). In the other set of games, the parent was given complete details on this set of games, instructions on the games, and all 11 decisions made by the child in this set of games (C). That is, parents were informed of how their child played with them, and they were told of all potential payouts to the child and the parents in this set of games. The procedures for these two sets of games were very similar to that of Porter and Adams (2016). One notable difference is that we have all participants play both sets of games, whereas in Porter and Adams (2016), each participant either played the equivalent of Games B or Games C but not both.

We had all participants play both of these sets of games so that we could compare how participants differed in their response to whether or not their parents were informed of their decisions. In Games C, where parents receive full information, it would be highly likely that many participants could "undo" the decisions made in the lab in further interactions and discussions with parents on these experiments. For example, subjects who are altruistically linked with parents may keep tokens when the hold value is higher and give all tokens to parents when the pass value is higher. In this case, they would perhaps care at least as much about their parents as they do about themselves, and they can share their winnings with them later. However, this kind of undoing of the decisions in the lab would be made much easier only when parents receive full information about the games. It would be difficult for participants to explain these games on their own, as well as to outline how they played the games, or to convince parents to make transfers in response to such decisions.

The order of these three sets of games (A, B, and C) was randomized across sessions. That is, all participants in a given session saw these games in the same order, but each session varied in

terms of whether subjects first played with parents or strangers, or which information treatment was played initially.

It is important to note that parents and participants were paid in the same way, in order to ensure that the way in which subjects or recipients were paid would not confound giving decisions because of differences in uncertainty of receipt of payment to one or the other. All payments determined by these experiments were sent via China's postal service; this included payments made to participants and their parents.

We expected there to be some cases in which participants would have parents living separately with different addresses. In these cases, we instructed participants to send payments to their mothers rather than fathers. We did so to ensure against any endogenously determined decisions regarding who the recipient might be. We did not want to give these participants a choice between parents, as this could then differentially influence their decisions in the lab in ways that we could not observe.

Another important note is that in the case of parents receiving a payment of zero (from either Games B or C), that they received the same notice from us as they would have had they received a positive amount. This was done to ensure that participants would not have an incentive to give zero to parents in order to avoid parental involvement. We wanted to ensure that a zero value of giving did not have any special meaning that differentiated it from any other payments. All the participants provided detailed mailing addresses for themselves and their parents. After the experiment, we mailed the letters and payments to parents and participants.

4 Study Sample Descriptives

In this section, we outline some of the characteristics of our sample, comparing men and women (Table 2A) and comparing gender neutral to gender biased ethnic groups (Table 2B). We also conduct sample means tests across these sub-groups.

There are a number of characteristics which do not differ significantly when comparing men and women. As previously mentioned, roughly 40% of our sample are from gender neutral ethnic

groups. At least two-thirds of the sample have at least one sibling, with one sibling on average. The mean age of the sample is around 21 years old. In China, all households are designated with a residential registration (called a hukou), which indicates whether one's registered place of residence is an urban or rural location. As many individuals have changed their hukou due to marriage or education, we asked respondents about their hukou status when they were three years of age. About 40% of respondents had a rural hukou at that age. We also asked respondents whether their parents had paid a fine when they were born, as a result of violation of the One Child Policy. Around 11% of respondents indicated their parents had done so.

[TABLE 2A HERE]

We also asked respondents about their current ties with parents, and there are several notable differences between men and women in this regard. As we might expect, in comparison to women, a significantly higher share of men expect to receive an inheritance from their parents; 46% of men expect it while only 34% of women expect it. This difference is statistically significant at the 5% level. There is a somewhat smaller, though perhaps somewhat notable difference in the share of men and women who have given money to their parents in the past year, with an average of 40% of men providing a financial transfer and 34% of women doing so. However, these differences are not statistically significant. Finally, we asked respondents whether they either look after or help their parents. For this question, respondents were given the following four options: (1) no support; (2) less than 20 hours of weekly support; (3) 20-49 hours of weekly support; (4) 50 or more hours of weekly support. On average, respondents give 20-49 hours of support: 3.2 for men and 3.4 for women. Given these averages, many more women than men provide 50 or more hours of support, which is consistent with the previously mentioned literature. This difference is also statistically significant at the 5% level.

There are two remaining notable differences between men and women. In China, college students generally know where they rank in their individual majors. We asked respondents for their ranking in the last semester, providing the following five possible categories, ranging from the top 10% (1) to the bottom 25% (5). Whereas women's average ranking is in the top 25%, men averaged about

halfway between the top 25% and the top 50%. This difference in ranking is statistically significant at the 1% level.

In terms of the remaining characteristics summarized in Table 2A, men and women are generally pretty similar. Over 80% of respondents had lived with their parents when they were less than 16 years of age. For the majority of respondents, their fathers had completed primary school at a minimum. In terms of the recipient in games played with parents, there are no significant differences between men and women, and most respondents sent the payment to both their parents. Recall that in the case of parents living at separate addresses, respondents were asked to send payments to mothers; fathers alone were recipients only if they were widowers. This condition was imposed in order to avoid endogenous selection of the recipient.

In terms of the particular experimental sessions, we do not find any significant differences between men and women. Our sample was fairly evenly split between men and women across the two different experiment locations. As the order in which games were played varied by session, we also examine whether this ordering differed for men and women and we do not find any differences. Men and women were equally likely to have either played with strangers or parents initially. They were also equally likely to play the information treatment games with parents before or after the no information treatment games with parents.

While men and women are similar across many observed characteristics of interest here, gender biased ethnic groups are considerably different from gender neutral groups. Table 2B outlines these differences. In the multivariate regression estimates outlined below, we find that controlling for these differences do not alter any findings. Thus, estimated differences across gender and ethnicity cannot be explained by the observed differences outlined here.

As we are primarily comparing different sets of minority groups which differ in terms of whether they have a cultural preference for sons, one might be concerned that many of these differences may be due to the fact that a considerable share of those in the gender biased group are from the Han majority, since 25% of the sample is Han. We check for this possibility by excluding Han respondents, and we find that most differences across the two sets of minority groups hold with

this exclusion. In the following, we point out which observed differences between gender biased and gender neutral ethnic groups may be driven by Han respondents.

[TABLE 2B HERE]

As we might expect, gender neutral respondents have more siblings on average compared to gender biased respondents. While around 70% of gender biased respondents have at least one sibling, 80% of gender neutral respondents do so. The Han subjects play somewhat of a role in these differences, as they were the focus of the One Child Policy. In fact, when they are excluded, mean differences in the number of brothers are no longer statistically significant across the two groups. However, the difference in the average number of sisters is greater and remains statistically significant at the 1% level even when the Han are excluded. This can be explained by gender biased parents continuing to have children until they have a son, or not having an additional child once they have a son. In comparison, gender neutral parents would not have such a stopping rule.

Relatedly, a significantly higher share of gender biased respondents had parents who paid a fine when they were born for violating the One Child Policy. Only 4% of gender neutral respondents had parents do so, while 16% of gender biased parents did. Since the One Child Policy was primarily aimed at restricting births among the Han majority, one may be concerned that these differences are driven by Han respondents. However, 15% of gender biased parents with Han excluded reportedly paid such a fine. In comparison to gender neutral parents, gender biased parents would have been more willing to pay a fine if they had a daughter, in order to have a son. Indeed, this is why we see considerably higher sex ratios at second birth for these ethnic groups.

The two sets of ethnic groups also differ across a number of other characteristics that cannot be as readily explained as the aforementioned differences in siblings and related fines. One important and notable difference is in travel time to one's parents. The average travel time for gender neutral respondents is 32 minutes, and 21-23 minutes for gender biased respondents. These mean differences are statistically significant at the 1% level. This could potentially be an important factor in shaping decisions in the lab; those who live closer to their parents may more readily "undo" their lab decisions once outside the lab. Another indication of the extent to which respondents may be able

to undo their lab decisions is in whether they have given money to their parents in the past year. If they have done so, they can perhaps undo decisions in the lab by sending a lower payment in the future. While 41% of gender biased respondents have given money to parents, only 27% of gender neutral respondents have done so. These differences are also statistically significant. A third notable difference across ethnic groups is in the average share of respondents who had lived with their parents when under the age of 16. Whereas 87% of gender neutral respondents had done so, only 79% of gender biased respondents had done so, and when Han respondents are excluded, this share declines to 75%. In terms of parental education, the Han respondents do seem to be driving a share of the differences between gender biased and gender neutral respondents. Including Han respondents, 93% of gender biased respondents have a father who completed at least primary school; excluding Han respondents this share declines to 90%; 87% of gender neutral respondents had a father who had completely primary school or higher.

Finally, there is a notable and statistically significant difference in the location of the experiment when comparing the two groups of respondents. A larger share of gender neutral respondents participated in the experiments in Beijing. This is due to the fact that the experiments initially took place in Chengdu and we found that we had not recruited as many respondents from gender neutral ethnicities as would have liked. Thus, further efforts were made to recruit gender neutral respondents in subsequent experiments carried out in Beijing. This also led to a noticeable difference in the order in which games with parents were played by respondents, as this ordering varied by session. Because of these differences across gender groups, we control for this game order in all multivariate regressions.

5 Revealed Preference Analysis

In this section, we apply the "revealed preference" approach (Samuelson 1938, 1948; Afriat 1967, Diewert 1973, Varian 1982) to participants' decisions following Porter and Adams (2016). The authors of that study showed that gifts to both strangers and parents can be treated as goods over

which individuals have a rational preference ordering, and that very few people would consider gifts to parents and strangers as the same goods. That is, very few people have a rational preference ordering when treating gifts to these two different recipients as the same good.

Such rational preference ordering can be consistent with a number of different concepts of rational behavior. We define rational behavior to be decisions that are consistent with the Generalized Axiom of Revealed Preference (GARP), following Andreoni and Miller (2002). For distinct bundles of alternatives $A, B, ...Z$, each lying on a linear budget constraint, A is *directly revealed preferred* to B if B was in the choice set when A was chosen. If A is directly revealed preferred to B, B is directly revealed preferred to C,... to Y, and Y is directly revealed preferred to Z, then A is *indirectly revealed preferred* to Z. Given these definitions, the following is a necessary and sufficient condition for well-behaved preferences with a linear budget constraint (Varian 1993):

Axiom 1 (Generalized Axiom of Revealed Preference (GARP)) *If A is indirectly revealed preferred to B, then B is not strictly directly revealed preferred to A, that is, A is not strictly within the budget set when B is chosen.*

According to this definition of rationality, one chooses the most preferred bundle among all affordable bundles. That is, if someone prefers the consumption bundle $\mathbf{q}_t$ to $\mathbf{q}_s$, then $\mathbf{q}_s$ can only be observed if $\mathbf{q}_t$ is unaffordable at the time one is faced with budget s rather than budget t.

We find that nearly 90% of participants make decisions in games with parents that satisfy GARP (see Figure 2). This rate of passing GARP is very similar to rates found in other studies of this kind. However, pass rates in games with strangers are lower - close to 80%.

[FIGURE 2 HERE]

We find that a significant determinant of passing GARP in games with strangers is whether they play these games before they play the games with parents (see Table 3). Participants are far less likely to pass GARP if the first set of games they see are the games with strangers. We believe this has to do with the fact that there is much more at stake for participants when they

play the games with parents, particularly in the full information case (Games C), and because of this the participants think much more carefully about their decisions. This may help improve their understanding of the game by the time they are ready to repeat the games with strangers. That their pass rates in games with strangers are about ten percentage points lower than in other studies may be a reflection of lower cognitive abilities in this population. Participants in this study come from many families with limited resources and their parents have much lower education levels compared to prior studies of this kind. For many of our participants, they are the first in their families to attend college.

[Table 3 HERE]

Another significant predictor of passing GARP in games played with strangers is being from a gender neutral ethnic group. When we interact one's own gender with this indicator for ethnic group, we find that men from gender neutral ethnic groups are significantly more likely to pass GARP in games with strangers compared to women from gender biased ethnic groups. In addition, men from gender neutral ethnic groups are also significantly more likely to pass GARP when all three sets of games are combined and all forms of giving are treated as the same good. This indicates that many gender neutral men do not differentiate between giving to parents and giving to strangers.

In fact, nearly 20% of participants pass GARP when all three sets of games are combined and all forms of giving are treated as the same good. A much higher share of participants - nearly 70% - pass GARP when both sets of games with parents are combined and treated as one good. This indicates that for a majority of participants, information provided to parents does not significantly affect their decisions in these games.

For those who pass GARP in each of the three set of games A, B, and C, we test whether their choice behavior is consistent with one of the following four categories of preferences:

1. Perfectly selfish participants maximize the utility function $U_s = \pi_s$, where π_s is one's own payoff;

2. Participants with Leontief preferences maximize the utility function: $U_s = \min\{\pi_s, \pi_0\}$, where π_0 is the payoff to the recipient in the dictator game;

3. Participants who maximize preferences exhibiting perfect substitutes maximize the following utility function: $U_s = \pi_s + \pi_0$;

4. Participants who are perfectly selfless (towards parents) maximize the following utility function: $U_s = \pi_0$.

We find that in games with strangers, about 10% of participants make decisions that are consistent with strongly selfish preferences (see Figure 3). That is, about 10% of participants share nothing with strangers. About 5% of participants exhibit preferences consistent with perfect substitutes utilities towards giving to strangers. That is, they give all tokens to strangers when the cost of giving each token is less than one, and they keep all tokens for themselves when the cost of giving is greater than one. None of the participants exhibit selfless or Leontief preferences for giving to strangers. Remaining participants who pass GARP with strangers do not fit perfectly into any of the above four categories.

[FIGURE 3 HERE]

In games with parents, the distributions of preference types are considerably different from that of strangers, but they are very similar across information treatments. About 30% of participants have perfect substitutes preferences toward parents, in both sets of games with parents. A few participants have strongly selfless preferences, giving all tokens to parents in all games and leaving nothing for themselves. A considerably smaller group of participants are completely selfish when playing with their parents. None of the participants share equally with parents all of the time. The majority of participants have preferences that do not fit perfectly into one of the four categories of preferences noted above.

For those who could not be perfectly rationalized by these preferences classes, we determine which of the four they are "closest to," by measuring "closeness" on a Euclidean metric. We

calculate the Euclidean distance between observed budget shares and those predicted by the four preference types, and then classify subjects as "weakly" of the preference type that achieves the minimum deviation. The proportion of respondents in each of these categories is indicated in Figure 3.

In addition to this classification of participants' preferences into one of these categories, for those whose preferences are not consistent with one of the four strict classifications of preferences, we also estimate the parameters of the following utility function with constant elasticity of substitution (CES):

$$U_s = u(\pi_s, \pi_o) = (a\pi_s^\rho + (1-a)\pi_o^\rho)^{1/\rho}. \tag{1}$$

The two parameters of this CES utility can be interpreted as follows: a gives the weight on "own" consumption, indicating the degree of selfishness ($a = 1$ when perfectly selfish and $a = 0$ when perfectly selfless); and ρ determines the elasticity of substitution (or $\sigma = 1/(\rho - 1)$) between one's own payoff and that of the recipient. As ρ approaches -∞, preferences are Leontief. When $\rho = 1$, preferences are perfect substitutes.

We assume that each subject maximizes his or her utility U_s subject to the following budget constraint:

$$\begin{aligned} p_s\pi_s + p_0\pi_0 &= m \text{ or} \\ \pi_s + p\pi_0 &= m' \end{aligned}$$

where $p = p_0/p_s$ and $m' = m/p_s$.

This maximization results in the following demand function:

$$\begin{aligned} \pi_s(p, m') &= \frac{[a/(1-a)]^{1/(1-\rho)}}{p^{-\rho/(\rho-1)} + [a/(1-a)]^{1/(1-\rho)}} m' \\ &= \frac{A}{p^r + A} m' \end{aligned}$$

where $r = -\rho/(1-\rho)$ and $A = [a/(1-a)]^{1/(1-\rho)}$

We estimate A and r using a two-limit nonlinear Tobit by maximum-likelihood. This takes into account the fact that subjects' choices are censored at both ends of the budget constraint. To remove heteroskedasticity in the error term in levels, demands are estimated as budget shares with an i.i.d error term. The estimated demand function is the following:

$$\frac{\pi_s(p,m)}{m} = \frac{A}{p^r + A} + \varepsilon, \tag{2}$$

where $\varepsilon \sim N(0, \sigma^2)$.

In order to identify the ways in which different subsets of our study population differ significantly in their preference parameters, we estimate these parameters A and r for different subsets of our study participants, so long as they exhibit weak preferences that are consistent with GARP. In particular, we estimate parameters for men, women, and those from gender biased and gender neutral ethnic groups. We also estimate parameters separately for men from gender biased and gender neutral ethnic groups, as well as for women from these two different ethnic groups. We do so for each of the three sets of games A, B, and C. We then test whether mean estimates of each of these parameters are statistically significantly different from one another when comparing across these different subsets of participants.

6 Regression Analysis

We further explore differences in giving behavior across gender and ethnicity using a multivariate regression approach. In this regression analysis, we restrict our sample to those who pass GARP and have weak preferences as defined in the previous section. For this sample, we can examine the marginal effects of the information treatment and recipient on shares given to the recipient, and estimate differences across sub-groups.

To explore the potential impact of the information treatment on shares given to parents, we further restrict our sample to only games played with parents and we estimate the following regression model:

$$y_{ij} = \beta_0 + \beta_1 Info_j * male_i + \beta_2 price_j + \beta_3 tokens_j + \beta_4 game\_order_i + \beta_5 X_i + \varepsilon_{ij} \quad (3)$$

In this model, y_{ij} is the share given to parents by participant i in game j, where a game is defined by the amount of tokens available for sharing, the relative price of giving, and the information treatment. As this outcome variable varies between 0 and 100, we estimate Tobit regression models censored at 0 and 100. With participants playing all variations of the dictator games, we have 22 observations for each participant. For this reason, standard errors are clustered by individual respondent. As we are primarily interested in identifying differential effects by gender and ethnic group, we interact the information treatment of each game with an indicator for whether the respondent is male, and estimate the model for the entire sample, as well as separately for gender neutral and gender biased ethnic groups. All regressions also include: two dummy variables indicating whether the price of giving is above or below 1 ($price_j$); the varying number of tokens available for sharing in each game ($tokens_j$); and two respondent-level variables indicating whether the respondent played first with strangers or parents and whether she played the information treatment before the no information treatment ($game\_order_i$).

From the descriptive statistics and sample means tests across gender and ethnic group category, we have seen several notable differences. As a number of factors are correlated with our main variables of interest, by excluding them from our estimates we may be biasing estimates of interest. To address this potential omitted variable bias, we control for the different characteristics listed in Tables 1A and 1B in additional regressions. That is, additional covariates (X_i) are included to control for potential characteristics of the respondent that may influence sharing decisions and may be correlated with one's gender and/or ethnicity. Such characteristics include: the share given to strangers; whether the recipient was one's mother, father, or both parents; an indicator for the university where the experiment took place; an indicator for the respondent being an only child; number of siblings; travel time to parents; whether the respondent expects an inheritance; whether the respondent gave parents money or other forms of support; whether one's parents paid a One Child Policy fine for one's birth; the respondent's ranking in one's major; whether the respondent

lived with one's parents before age 16; and the education level of one's father.

We also estimate similar regression models to (3), where the interaction term is between the information treatment and an indicator for whether the respondent is from a gender neutral ethnic group:

$$y_{ij} = \beta_0 + \beta_1 Info_j * gender\_neutral_i + \beta_2 price_j + \beta_3 tokens_j + \beta_4 game\_order_i + \beta_5 X_i + \varepsilon_{ij} \quad (4)$$

In addition to identifying the potential role of gender, ethnicity, and the information treatment in games with parents, we are interested in identifying differences in how respondents play the games depending on whether the recipient in the game is one's parent or a stranger. To do so, the sample is restricted to games played with strangers and games played with parents under no information only, so that the two sets of games in this set of regressions are similarly played anonymously. We estimate similar regression models to (3), but here, the interaction term is between an indicator for the recipient being one's parent(s) and an indicator for whether the respondent is male:

$$y_{ij} = \beta_0 + \beta_1 Parent_j * male_i + \beta_2 price_j + \beta_3 tokens_j + \beta_4 game\_order_i + \beta_5 X_i + \varepsilon_{ij} \quad (5)$$

Finally, as in the previous set of regressions, we also estimate similar models, but where the interaction term is between the recipient and an indicator for whether one is from a gender neutral or gender biased ethnic group:

$$y_{ij} = \beta_0 + \beta_1 Parent_j * gender\_neutral_i + \beta_2 price_j + \beta_3 tokens_j + \beta_4 game\_order_i + \beta_5 X_i + \varepsilon_{ij} \quad (6)$$

All other covariates remain the same, with all standard errors clustered by respondent.

7 Results

7.1 CES Parameter Estimates

In this section, we summarize results from estimating the parameters of the CES utility function (1) (a and ρ), by estimating parameters A and r of the demand function (2). We do so for each of the three sets of modified dictator games: games with parents who receive no information about the lab experiments; games with parents who receive full information about subjects' decisions and payouts; and games with strangers who remain anonymous. In addition, all parameters are estimated for the following sub-groups: men, women, respondents from gender neutral ethnic groups, respondents from gender biased ethnic groups, as well as men and women within each of the latter two groups. We find that men are notably more selfish than women when playing with parents, and these differences are greatest among respondents from gender biased ethnic groups. The findings discussed here are also robust to excluding Han respondents from the sample.

Table 4 summarizes the results of comparing CES parameter estimates across men and women. We find that estimates of a, the measure of selfishness, are around 0.43 for women and 0.46 to 0.48 for men, with very similar estimates across information treatments. In comparison, estimates of a in Porter and Adams (2016)'s UK study were 0.42 for the full information treatment and 0.57 for the no information treatment. Thus, our sample of women is quite similar in terms of selfishness to that of the UK sample, and men in our sample are slightly more selfish than either women or those in the UK under the full information treatment. These gender differences are statistically significant at the 1% level. In contrast, when strangers are recipients, men are slightly less selfish in comparison to women, with statistically significant differences. In terms of the elasticity of substitution (ρ), all of the estimates indicate that preferences are relatively flat or close to perfect substitutes, with men being slightly more responsive to price changes in comparison to women.[1] This responsiveness to the price of giving is greater in games with strangers compared to parents.

[1]For reference, for games with parents, Porter and Adams (2016) estimated a ρ of 0.47 for those with weakly perfect substitutes preferences, and -3.6 for those with weakly Leontief preferences.

[TABLE 4 HERE]

In comparing respondents in gender neutral ethnic groups to those in gender biased ethnic groups (Table 5), there are no significant differences in the degree of selfishness towards parents. Gender neutral respondents are more selfish towards strangers. In terms of the elasticity of substitution, gender neutral respondents are more responsive to price changes in games with fully informed parents, as well as in games with strangers.

[TABLE 5 HERE]

The primary differences in selfishness are evident when we compare men across different ethnic group categories, or when we compare men and women among gender biased ethnicities. Table 6 summarizes these differences, where we only provide the difference in parameter estimates a and ρ, and the standard errors for these differences. For the sample of men only, the difference in a for gender biased compared to gender neutral men is 0.054 in games with uninformed parents, and this difference is statistically significant at the 1% level. This difference is similar in games with fully informed parents, though not statistically significant. Similarly, gender biased men are more selfish towards uninformed parents compared to their female counterparts. The difference in estimates of a is 0.033, and it is statistically significant at the 1% level. It is also notable that this difference is only evident in the no information treatment group, as giving in this treatment would be more of an indication of altruistic giving, whereas giving in the full information treatment group would be a possible indicator of strategic motives for giving. Differences in selfishness among women or among gender neutral respondents are much smaller in games involving parents.

[TABLE 6 HERE]

These differences contrast sharply with differences in estimates of the parameter a in games involving strangers. In these games, gender biased men are less selfish compared to their gender neutral counterparts, as are gender biased men in comparison to gender biased women. In addition, when we compare women, gender biased women are more selfish towards strangers in comparison

to gender neutral women; when we compare gender neutral men to women, men are more selfish towards strangers. These differences are also statistically significant at the 1% level.

7.2 Multivariate Regression Analysis

In this section we summarize estimates of the regression models outlined in Section 6. We first estimate regression models (3) and (4), where the unit of observation is a particular game played with parents (Table 7). We find that men give parents roughly 6.5 percentage points less in tokens in comparison to women, and we do not find significant responses to the information treatment. This gender difference is more pronounced when we restrict our sample to only respondents in gender biased ethnic groups. Among these ethnicities, men give parents roughly 9.7 percentage points less than women. Both of these estimates are statistically significant. Among gender neutral respondents, the estimated coefficient on the male indicator is only -2.4 with high standard errors. We do not see significant differences in giving to parents across ethnic group category, either for the whole sample or for either of the gender-specific samples. These findings are robust to excluding Han respondents from the sample, as well as to including the additional covariates outlined in Section 6. We also find that respondents across all categories are sensitive to changes in price, giving 15 to 18 percentage points more when the price of giving is less than one and giving roughly 12 percentage points less when the price of giving is greater than one. Finally, a one percentage point increase in the share given to strangers results in an increase in giving to parents of about 0.3 percentage points.

[TABLE 7 HERE]

Next, we estimate regression models (5) and (6), with results summarized in Table 8. In these regressions, we compare how different participants respond to giving anonymously either to a stranger or to one's own parent. We find that while women participants give between 14 and 29 percentage points more to parents than strangers, men are considerably less responsive to the change in recipient. In the overall sample, men give 17 percentage points more to parents (=27-10), while women

give 27 percentage points more to parents. This gender difference is greatest among gender biased participants, where men give 14 percentage points more to parents than strangers, and women give 29 percentage points more to parents. In contrast, we do not see such differences among gender neutral respondents. We also do not see significant differences when we compare gender neutral to gender biased respondents, in the overall sample, or in subsamples of men and women. That is, differences in giving to parents are again most stark when comparing men and women in gender biased ethnic groups. These findings are robust to excluding the Han sample and to controlling for observable characteristics as noted above.

[TABLE 8 HERE]

8 Conclusion

We find that men and women in China have different preferences for sharing with their own parents, and that these differences are particularly pronounced among families with a preference for sons. We find that among those from ethnic groups with gender bias, men give parents less than women do. In contrast, among those from ethnic groups without gender bias, men and women give similarly to parents. In addition, gender-neutral men give parents more than gender-biased men do. These findings are consistent across both the estimation of differences in preference parameters using a revealed preference framework, as well as the multivariate regression analysis on individual shares given to recipients. The results are robust to controlling for observed differences across gender and ethnic groups.

These findings have important implications for framing policies and programs aimed at improving the welfare of China's aging population. A strong preference for sons, combined with restrictions on having only one child, have resulted in many aging parents relying on an only son for support. Our findings imply that such only sons who grew up in a culture of strong son preference generally have lower levels of altruism towards their parents. This would imply that public pension systems would provide an important source of financial security for aging parents, and would not crowd out

a significant share of private transfers.

Future research is needed to understand the mechanisms behind the observed differences in sharing behavior across gender and ethnic groups, and the extent to which parents can perhaps induce altruism in their children through long-term investments (Becker 1992). Understanding such family dynamics can be helpful in designing public policies that can address the welfare needs of individual family members at different stages of the life course.

In addition, further research is needed to understand ways in which we can mitigate the predominating preference for sons in China, and in many other Asian countries. Murphy et al. (2011) found lower son preference resulting from education, mechanization of agricultural production, and greater employment opportunities for women. These results, along with our findings on differences in altruism towards parents, indicate that there are potentially far-reaching implications for improving education and employment opportunities for girls and women.

9

References

1. Afriat, S.N. 1967. "The Construction of Utility Functions from Expenditure Data." *International Economic Review* 8(1): 67-77.

2. Andreoni, J. and J. Miller. 2002. "Giving according to GARP: an experimental test of the consistency of preferences for altruism." *Econometrica* 70(2): 737–753.

3. Arnold, F., and Z. Liu. 1986. "Sex preference, fertility, and family planning in China." *Population and Development Review* 12: 221-246.

4. Becker, G.S. 1974. "A Theory of Social Interactions." *Journal of Political Economy* 82: 1063-94.

5. Becker, G.S. 1981. *A Treatise on the Family.* Cambridge: Harvard University Press.

6. Becker, G.S. 1993. "Nobel Lecture: The Economic Way of Looking at Behavior." *Journal of Political Economy* 101(3): 385-409.

7. Becker, G., Murphy, K.L., and J.L. Spenkuch. 2016. "The Manipulation of Children's Preferences, Old-Age Support, and Investment in Children's Human Capital." *Journal of Labor Economics* 34(2): S3-S30.

8. Bernheim, Shleifer, and Summers. 1985. "The Strategic Bequest Motive." *Journal of Political Economy* 93(6): 1045-1076.

9. Cai, F., J. Giles, and X. Meng. 2006. "How Well Do Children Insure Parents Against Low Retirement Income? An Analysis Using Survey Data from Urban China." *Journal of Public Economics* 90(12): 2229-2255.

10. Cox, D. 1987. "Motives for Private Income Transfers." *Journal of Political Economy* 95(3): 508-546.

11. Cameron, L., Erkal, N., Gangadharan, L., and X. Meng. 2013. "Little Emperors: Behavioral Impacts of China's One Child Policy." *Science Translational Medicine* 339 (6122): 953-957.

12. Coale, A., and J. Banister. 1994. "Five Decades of Missing Females in China." *Demography* 31(3): 459-479.

13. Cong, Z., and M. Silverstein. 2014. "Parents' preferred care-givers in rural China: gender, migration and intergenerational exchanges." *Ageing and Society* 34(5): 727-752.

14. Das Gupta , M., Zhenghua, J., Bohua, L., Zhenming, X., Chung, W., and B. Hwa-Ok. 2003. "Why is Son preference so persistent in East and South Asia? a cross-country study of China, India and the Republic of Korea." *Journal of Development Studies* 40(2): 153-187.

15. Diewert, W. 1973. "Afriat and Revealed Preference Theory." *Review of Economic Studies* 40(3): 419-425.

16. Ebenstein, A. and S. Leung. 2010. "Son Preference and Access to Social Insurance: Evidence from China's Rural Pension Program." *Population and Development Review* 36(1): 47-70.

17. Fisman, R., Kariv, S. and D. Markovits. 2007. "Individual preferences for giving." *American Economic Review* 97(5): 1858–1876.

18. Harbaugh, W.T., Krause, K. and T.R. Berry. 2001. "GARP for kids: on the development of rational choice behavior." *American Economic Review* 91(5): 1539–1545.

19. Kadoya, Y., and M.S.R. Khan. 2017. "Can concern for the long-term care of older parents explain son preference at birth in India?" *Journal of Women & Aging* 29(3): 254-266.

20. Kazianga, H. 2006. "Motives for household private transfers in Burkina Faso." *Journal of Development Economics* 79(1): 73-117.

21. List, J.A., and D.L. Millimet. 2008. "The market: catalyst for rationality and filter of irrationality." *B.E. Journal of Economic Analysis and Policy* 8(1): Article 47.

22. Luo, B., and H. Zhan. 2011. "Filial Piety and Functional Support: Understanding Intergenerational Solidarity Among Families with Migrated Children in Rural China." *Ageing International* 37(1).

23. Mattei, A. 2000. "Full-scale real tests of consumer behavior using experimental data." *Journal of Economic Behavior and Organizatio*n 43(4): 487-497.

24. Mu, R., and X. Zhang. 2011. "Why does the Great Chinese Famine affect the male and female survivors differently? Mortality selection versus son preference." *Economics and Human Biology* 9: 92-105.

25. Murphy, R., Tao, R., and X. Lu. 2011. "Son Preference in Rural China: Patrilineal Families and Socioeconomic Change." *Population and Development Review* 37(4): 665-690.

26. Peters, H.E., Ünür, A.S., Clark, J., and W.D. Schulze. 2004. "Free-Riding and the Provision of Public Goods in the Family: A Laboratory Experiment." *International Economic Review* 45(1): 283-299.

27. Porter, M., and A. Adams. 2016. "For Love or Reward? Characterising Preferences for Giving to Parents in an Experimental Setting." *Economic Journal* 126: 2424-2445.

28. Samuelson, P.A. 1938. "A Note on the Pure Theory of Consumer's Behaviour." *Economica* 5(17): 61-71.

29. Samuelson, P.A. 1948. *Economics.* McGraw-Hill Education.

30. Secondi, G. 1997."Private Monetary Transfers in Rural China: Are Families Altruistic?" *Journal of Development Studies* 33(4): 487-511.

31. Sippel, R. 1997. "An experiment on the pure theory of consumers' behavior'." *Economic Journal* 107(444): 1431–1444.

32. Trivers, R.L. 2002. *Natural Selection and Social Theory: Selected Papers of Robert L. Trivers.* Oxford University Press: New York, NY.

33. Varian, H.R. 1982. "The Nonparametric Approach to Demand Analysis." *Econometrica* 50(4): 945-973.

34. Varian, H.R. 1994. "Goodness-of-Fit for Revealed Preference Tests." University Library of Munich, Germany. Available at: https://ideas.repec.org/s/wpa/wuwpem.html

35. Xie, Y., and H. Zhu. 2009. "Do Sons or Daughters Give More Money to Parents in Urban China?" *Journal of Marriage and Family* 71: 174-186.

36. Zeng, Y., Brasher, M.S., Gu, D., and JW. Vaupel. 2016a. "Older Parents Benefit More in Health Outcomes From Daughters' Than Sons' Emotional Care in China." *Journal of Aging and Health* 28(8): 1426-1447.

37. Zeng, Y., George, L., Sereny, M., Gu, D., and J.W. Vaupel. 2016b. "Older parents enjoy better filial piety and care from daughters than sons in China." *American Journal of Medical Research* 3(1); 244-272.

38. Zhang, Z., Gu, D., and Y. Luo. 2014. "Coresidence With Elderly Parents in Contemporary China: The Role of Filial Piety, Reciprocity, Socioeconomic Resources, and Parental Needs." *Journal of Cross-Cultural Gerontology* 29: 259-276.

39. Zhu, H., and A. Walker. 2018. "Pension system reform in China: Who gets what pensions?" *Social Policy and Administration* 52(7): 1410-1424.

TABLE 1.

ENDOWMENTS AND PRICES IN MODIFIED DICTATOR GAMES

N Tokens	Hold Value	Pass Value	Price of Giving
40	1 RMB	4 RMB	0.25
40	1 RMB	3 RMB	0.33
60	1 RMB	2 RMB	0.50
75	1 RMB	2 RMB	0.50
60	1 RMB	1 RMB	1.00
80	1 RMB	1 RMB	1.00
100	1 RMB	1 RMB	1.00
60	2 RMB	1 RMB	2.00
75	2 RMB	1 RMB	2.00
40	3 RMB	1 RMB	3.00
40	4 RMB	1 RMB	4.00

Table 2A. Sample Demographics and Other Descriptives By Gender of Respondent

	Men			Women			Means
	N	Mean	SD	N	Mean	SD	t-test
Gender Neutral = 1	131	0.41	0.49	238	0.37	0.48	
Has Siblings = 1	131	0.81	0.39	238	0.76	0.43	
Number of siblings	125	1.22	1.00	227	1.15	0.97	
Number of brothers	125	0.63	0.75	227	0.63	0.67	
Number of sisters	125	0.58	0.62	227	0.52	0.71	
Age	127	20.86	1.69	230	21.06	1.58	
Rural Hukou = 1 (HH registration status at age 3)	129	0.36	0.48	237	0.42	0.49	
One Child Policy Fine (Paid fine = 1)	131	0.12	0.33	238	0.11	0.32	
Travel time to mother's place of residence (min)	130	26.72	17.17	238	24.00	18.19	
Expect inheritance from parents = 1	131	0.46	0.50	238	0.34	0.48	**
Sent/Gave money to parents in last year = 1	131	0.40	0.49	238	0.34	0.47	
Look after/give help to parents?	131	3.24	0.79	238	3.41	0.70	**
Rank in Major	88	2.65	1.28	192	2.21	1.02	***
Lived with parents before age of 16 = 1	131	0.85	0.36	238	0.81	0.40	
Father completed primary school or higher	131	0.85	0.35	238	0.90	0.30	
Recipient (both parents=1, father=2, mother=3)	131	1.44	0.81	238	1.39	0.79	
Location of Experiments (Chengdu=1, Beijing=2)	131	1.47	0.50	238	1.44	0.50	
Played Strangers first	131	0.51	0.50	238	0.47	0.50	
Played Parents with Information before without	131	0.53	0.50	238	0.49	0.50	

*Notes: *** p<0.01 ** p<0.05 * p<0.1*

Table 2B. Sample Demographics and Other Descriptives Comparing Gender-Biased and Gender Neutral Ethnic Groups

	Gender Biased			Gender Biased (Han Excl.)			Gender Neutral			Means t-test	
	N	Mean	SD	N	Mean	SD	N	Mean	SD	All	Han Excluded
Gender (Male = 1)	226	0.34	0.47	137	0.37	0.49	143	0.38	0.49		
Has Siblings = 1	226	0.71	0.45	137	0.73	0.45	143	0.88	0.32	***	***
Number of siblings	219	0.98	0.87	132	1.13	0.98	133	1.50	1.06	***	***
Number of brothers	219	0.56	0.61	132	0.64	0.64	133	0.74	0.81	**	
Number of sisters	219	0.42	0.61	132	0.48	0.66	133	0.75	0.74	***	***
Age	218	21.02	1.71	131	21.07	1.52	139	20.94	1.49		
Rural Hukou = 1 (HH registration status at age 3)	225	0.40	0.49	136	0.62	0.49	141	0.38	0.49		
One Child Policy Fine (Paid fine = 1)	226	0.16	0.37	137	0.15	0.35	143	0.04	0.20	***	***
Travel time to mother's place of residence (min)	226	20.55	15.71	137	23.04	15.55	142	31.99	18.85	***	***
Expect inheritance from parents = 1	226	0.42	0.49	137	0.36	0.48	143	0.34	0.47		
Sent/Gave money to parents in last year = 1	226	0.41	0.49	137	0.41	0.49	143	0.27	0.45	***	**
Look after/give help to parents?	226	3.31	0.71	137	3.28	0.71	143	3.41	0.77		
Rank in Major	167	2.33	1.13	99	2.58	1.13	113	2.37	1.13		
Lived with parents before age of 16 = 1	226	0.79	0.41	137	0.75	0.43	143	0.87	0.33	**	***
Father completed primary school or higher	226	0.93	0.26	137	0.90	0.30	143	0.82	0.39	***	*
Recipient (both parents=1, father=2, mother=3)	226	1.42	0.81	137	1.38	0.77	143	1.38	0.78		
Location of Experiments (Chengdu=1, Beijing=2)	226	1.38	0.49	137	1.34	0.47	143	1.57	0.50	***	***
Played Strangers first	226	0.48	0.50	137	0.53	0.50	143	0.49	0.50		
Played Parents with Information before without	226	0.56	0.50	137	0.56	0.50	143	0.41	0.49	***	***

*Notes: *** p<0.01 ** p<0.05 * p<0.1*

Table 3. Likelihood of Passing GARP (Logit regressions)

	Strangers		Parents - Full Info		Parents - No Info		All Games Combined	
Male = 1	0.238	-0.133	0.054	-0.540	0.683**	0.321	0.152	-0.339
	(0.336)	(0.455)	(0.325)	(0.354)	(0.323)	(0.492)	(0.235)	(0.304)
Gender Neutral = 1	0.675***	0.294	-0.052	-0.580	-0.262	-0.465	0.337	-0.122
	(0.219)	(0.267)	(0.210)	(0.432)	(0.315)	(0.424)	(0.234)	(0.309)
Male x Gender Neutral		1.313**		1.881		0.873		1.434**
		(0.650)		(1.369)		(0.765)		(0.603)
Age	0.041	0.048	-0.167	-0.157	-0.056	-0.046	0.053	0.064
	(0.096)	(0.087)	(0.179)	(0.165)	(0.151)	(0.145)	(0.107)	(0.100)
Rural Hukou = 1	0.089	0.136	-0.401	-0.353	-0.279	-0.249	-0.142	-0.116
	(0.319)	(0.329)	(0.470)	(0.429)	(0.207)	(0.180)	(0.189)	(0.164)
Played Stranger First	-1.197***	-1.212***	-0.295	-0.310	-0.609*	-0.609**	-0.642***	-0.655***
	(0.296)	(0.292)	(0.302)	(0.309)	(0.315)	(0.310)	(0.225)	(0.225)
Full Info Before No Inf	0.028	0.064	-0.259	-0.246	0.564	0.579	-0.079	-0.037
	(0.293)	(0.309)	(0.343)	(0.357)	(0.372)	(0.359)	(0.245)	(0.259)
Constant	0.731	0.684	6.040	6.025	3.330	3.187	-0.257	-0.349
	(2.065)	(1.884)	(3.973)	(3.670)	(3.105)	(2.966)	(2.194)	(2.016)
Observations	339	339	339	339	339	339	354	354

Robust standard errors in parentheses, clustered by session.

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Comparison of CES Peference Parameters For Men and Women

	Parents - No Info			Parents - Full Info			Strangers		
	Men	Women	Difference	Men	Women	Difference	Men	Women	Difference
a	0.481***	0.437***	0.045***	0.461***	0.431***	0.030***	0.623***	0.658***	-0.035***
	(0.006)	(0.001)	(0.006)	(0.002)	(0.004)	0.005	(0.007)	(0.004)	(0.008)
ρ	0.506***	0.492***	0.014**	0.491***	0.447***	0.044	0.359***	0.273***	0.086***
	(0.006)	(0.003)	(0.007)	(0.044)	(0.030)	(0.053)	(0.028)	(0.002)	(0.028)
σ	2.025	1.969	0.056	1.965	1.808	0.157	1.559	1.375	0.184
A	0.859***	0.605***	0.254***	0.735***	0.603***	0.132***	2.189***	2.458***	-0.270
	(0.046)	(0.048)	(0.067)	(0.038)	(0.010)	(0.039)	(0.110)	(0.021)	0.112
r	-1.025***	-0.969***	-0.056	-0.965***	-0.808***	-0.157***	-0.559***	-0.375***	-0.184
	(0.079)	(0.004)	(0.079)	(0.030)	(0.012)	(0.032)	(0.059)	(0.038)	0.07
ln(L)	352.431	660.820		425.313	449.947		359.353	382.296	
n	781	1386		737	1397		891	1672	

*Notes: Standard errors in parantheses. ***p<0.01, **p<0.05, *p<0.10*

Table 5. Comparison of CES Parameters For Gender Biased and Gender Neutral Ethnic Groups

	Parents - No Info			Parents - Full Info			Strangers		
	Gender Neutral	Gender Biased	Difference	Gender Neutral	Gender Biased	Difference	Gender Neutral	Gender Biased	Difference
a	0.451***	0.456***	-0.005	0.442***	0.439***	0.003	0.661***	0.622***	0.039*
	(0.006)	(0.005)	(0.008)	(0.004)	(0.002)	(0.004)	(0.004)	(0.02)	(0.020)
ρ	0.482***	0.513***	-0.030	0.484***	0.428***	0.056**	0.325***	0.279***	0.046*
	(0.016)	(0.015)	(0.022)	(0.019)	(0.011)	(0.022)	(0.026)	(0.012)	(0.028)
σ	1.932	2.051	-0.120	1.938	1.748	0.19	1.481	1.388	0.094
A	0.682***	0.695***	-0.013	0.636***	0.653***	-0.017*	2.693***	1.996***	0.698***
	(0.031)	(0.038)	(0.049)	(0.008)	(0.004)	(0.009)	(0.067)	(0.029)	(0.073)
r	-0.932***	-1.051***	0.120**	-0.938***	-0.748***	-0.190***	-0.481***	-0.388***	-0.094**
	(0.023)	(0.045)	(0.051)	(0.005)	(0.021)	(0.021)	(0.022)	(0.030)	(0.037)
ln(L)	557.554	468.112		588.618	308.781		429.608	313.215	
n	1221	946		1232	902		1463	1100	
obs	111	86		112	82		133	100	

*Notes: Standard errors in parantheses. ***p<0.01, **p<0.05, *p<0.10*

Table 6. Differences in Estimated CES Parameters By Gender and Ethnic Category

		Men Only Gender Biased/ Gender Neutral	Women Only Gender Biased/ Gender Neutral	Gender Biased Only Men/ Women	Gender Neutral Only Men/ Women
Parents w/ No Info	a	0.054***	-0.011*	0.033***	0.011
		(0.009)	(0.006)	(0.009)	(0.012)
	ρ	0.017	-0.032	0.007	-0.022
		(0.035)	(0.029)	(0.029)	(0.035)
Parents w/ Full Info	a	0.058	-0.017**	-0.005	0.046
		(0.039)	(0.008)	(0.013)	(0.040)
	ρ	0.084	0.034	0.003	0.115***
		(0.021)	(0.030)	(0.040)	(0.034)
Strangers	a	-0.027**	0.033***	-0.032***	0.038***
		(0.012)	(0.010)	(0.012)	(0.013)
	ρ	0.019	0.114***	0.170***	-0.037
		(0.048)	(0.039)	(0.039)	(0.047)

*Notes: Standard errors in parantheses. ***p<0.01, **p<0.05, *p<0.10*

Table 7. Determinants of the Share of Tokens Given to Parents: Sensitivity to the Information Treatment

	All	All	Gender Biased	Gender Neutral	Women	Men
Male Respondent	-6.473**		-9.710***	-2.364		
	(2.576)		(3.221)	(4.028)		
Full Info x Male	1.176		-0.0165	2.578		
	(2.181)		(3.174)	(2.974)		
Parents Has Full Info	1.021	1.304	1.299	0.609	1.299	1.162
	(1.043)	(1.321)	(1.406)	(1.544)	(1.400)	(2.907)
Gender Neutral		-0.795			-3.483	5.135
		(2.670)			(3.321)	(4.514)
Full Info x Gender Neutral		0.353			-0.707	2.005
		(1.912)			(2.074)	(3.872)
Price of Giving < 1	16.18***	16.19***	17.69***	14.78***	15.49***	17.78***
	(1.856)	(1.856)	(2.625)	(2.676)	(2.312)	(3.129)
Price of Giving > 1	-12.36***	-12.36***	-12.66***	-12.42***	-11.43***	-13.94***
	(1.880)	(1.879)	(2.394)	(3.089)	(2.244)	(3.359)
Total Tokens = 60	0.205	0.209	0.157	-0.0732	0.505	-0.422
	(0.825)	(0.823)	(1.081)	(1.273)	(0.836)	(1.741)
Total Tokens = 75	0.506	0.513	0.214	0.479	1.143	-0.747
	(0.783)	(0.783)	(0.997)	(1.212)	(0.889)	(1.481)
Total Tokens = 80	1.069	1.069	2.778*	-1.443	2.187	-0.969
	(1.235)	(1.234)	(1.678)	(1.862)	(1.345)	(2.463)
Total Tokens = 100	0.709	0.711	1.252	-0.219	1.056	0.216
	(1.222)	(1.220)	(1.604)	(1.908)	(1.268)	(2.550)
Play Strangers First	-0.294	-0.525	-2.212	2.397	-0.199	1.907
	(2.381)	(2.389)	(2.919)	(3.870)	(2.703)	(4.570)
Play Full Info Before No Info	1.921	1.959	2.304	2.217	0.0950	5.842
	(2.307)	(2.479)	(2.932)	(4.032)	(2.789)	(4.592)
Share Given to Strangers	0.336***	0.334***	0.431***	0.248***	0.362***	0.293***
	(0.0503)	(0.0506)	(0.0565)	(0.0784)	(0.0580)	(0.0877)
Constant	44.04***	42.17***	42.29***	44.80***	45.06***	34.26***
	(3.064)	(3.460)	(3.904)	(5.075)	(3.707)	(6.944)
Observations	3,564	3,564	2,046	1,518	2,266	1,298

Robust standard errors in parentheses, clustered by respondent. *** p<0.01, ** p<0.05, * p<0.1

Table 8. Determinants of the Share of Tokens Given to Recipients: Giving to Strangers vs. Parents With No Information

	All	All	Gender Biased	Gender Neutral	Women	Men
Parent x Male	-9.992***		-14.75***	-5.147		
	(3.398)		(4.128)	(5.204)		
Male Respondent	3.804		10.43***	-2.444		
	(2.753)		(3.407)	(4.170)		
Parent is recipient	27.27***	24.74***	29.06***	24.64***	29.09***	14.32***
	(1.916)	(2.134)	(2.466)	(3.019)	(2.469)	(3.333)
Gender Neutral		2.129			4.822	-5.108
		(2.822)			(3.740)	(3.992)
Parent x Gender Netural		-2.479			-4.432	5.138
		(3.306)			(3.894)	(5.390)
Price of Giving < 1	11.82***	11.83***	10.03***	13.86***	9.968***	15.02***
	(1.688)	(1.689)	(2.291)	(2.498)	(1.989)	(3.037)
Price of Giving > 1	-12.31***	-12.31***	-11.37***	-13.31***	-12.49***	-11.99***
	(1.723)	(1.723)	(2.352)	(2.548)	(2.219)	(2.759)
Total Tokens = 60	-0.636	-0.634	0.488	-1.892*	0.190	-2.020
	(0.816)	(0.817)	(1.151)	(1.145)	(0.997)	(1.402)
Total Tokens = 75	0.861	0.869	1.689	-0.0690	2.291**	-1.573
	(0.847)	(0.849)	(1.165)	(1.234)	(0.961)	(1.565)
Total Tokens = 80	-1.157	-1.158	-0.0374	-2.402*	0.940	-4.744**
	(1.176)	(1.176)	(1.856)	(1.374)	(1.237)	(2.354)
Total Tokens = 100	-1.191	-1.187	-0.603	-1.812	-0.336	-2.602
	(1.307)	(1.309)	(2.065)	(1.547)	(1.398)	(2.632)
Play Strangers First	0.699	0.513	-2.626	3.026	4.002	-3.588
	(2.249)	(2.182)	(2.855)	(3.268)	(3.039)	(2.982)
Play Full Info Before No Info	-1.997	-1.769	-1.854	-1.303	-5.725*	2.802
	(2.183)	(2.270)	(3.133)	(3.287)	(3.061)	(3.315)
Constant	31.31***	31.66***	29.50***	33.78***	29.92***	37.53***
	(2.488)	(2.643)	(3.278)	(3.840)	(3.266)	(4.012)
Observations	3,256	3,256	1,716	1,540	2,046	1,210

Robust standard errors in parentheses, clustered by respondent. *** p<0.01, ** p<0.05, * p<0.1

Figure 1. Distribution of Chinese Ethnic Groups in Study Sample

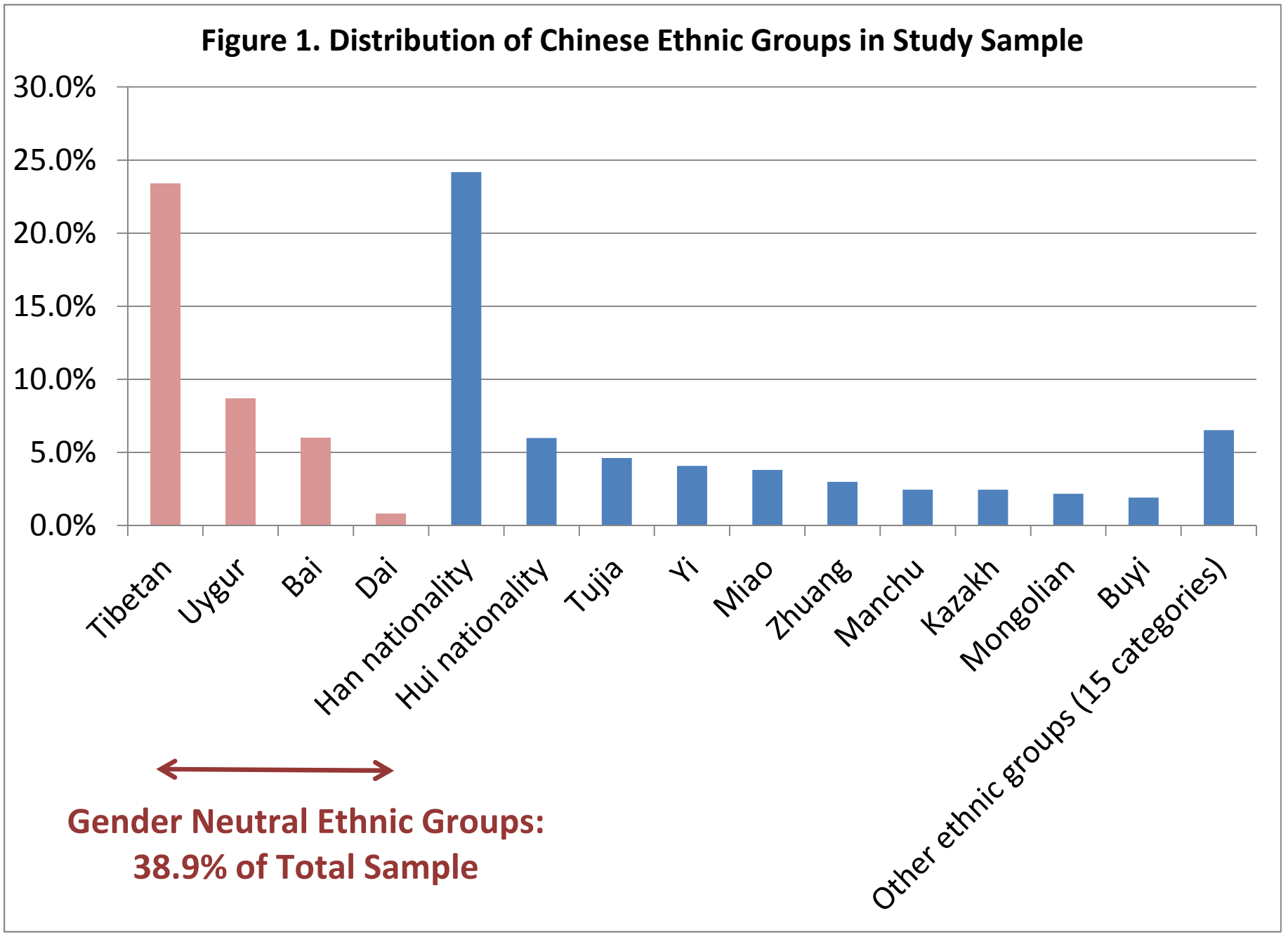


Figure 2. GARP Pass Rates

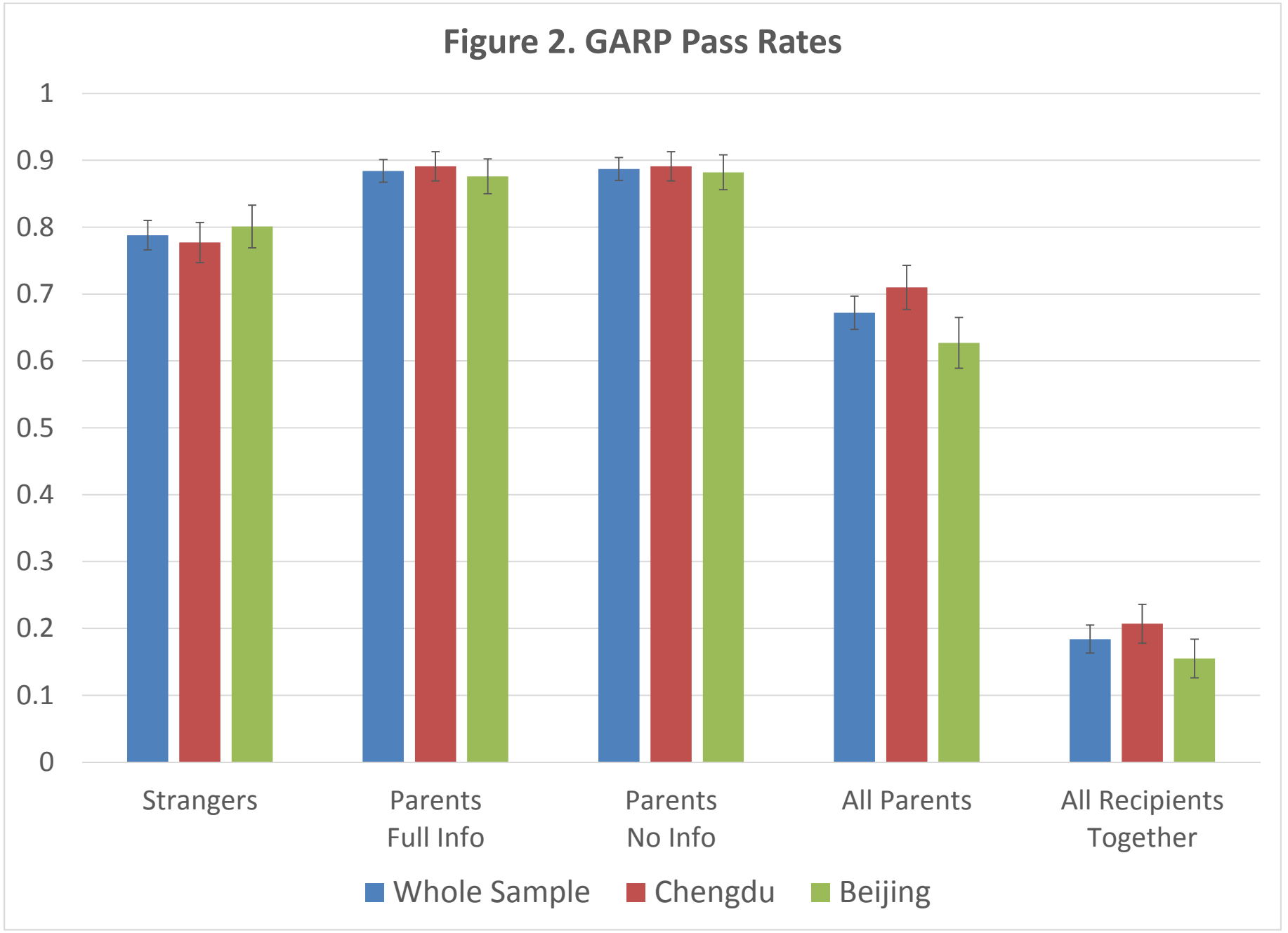
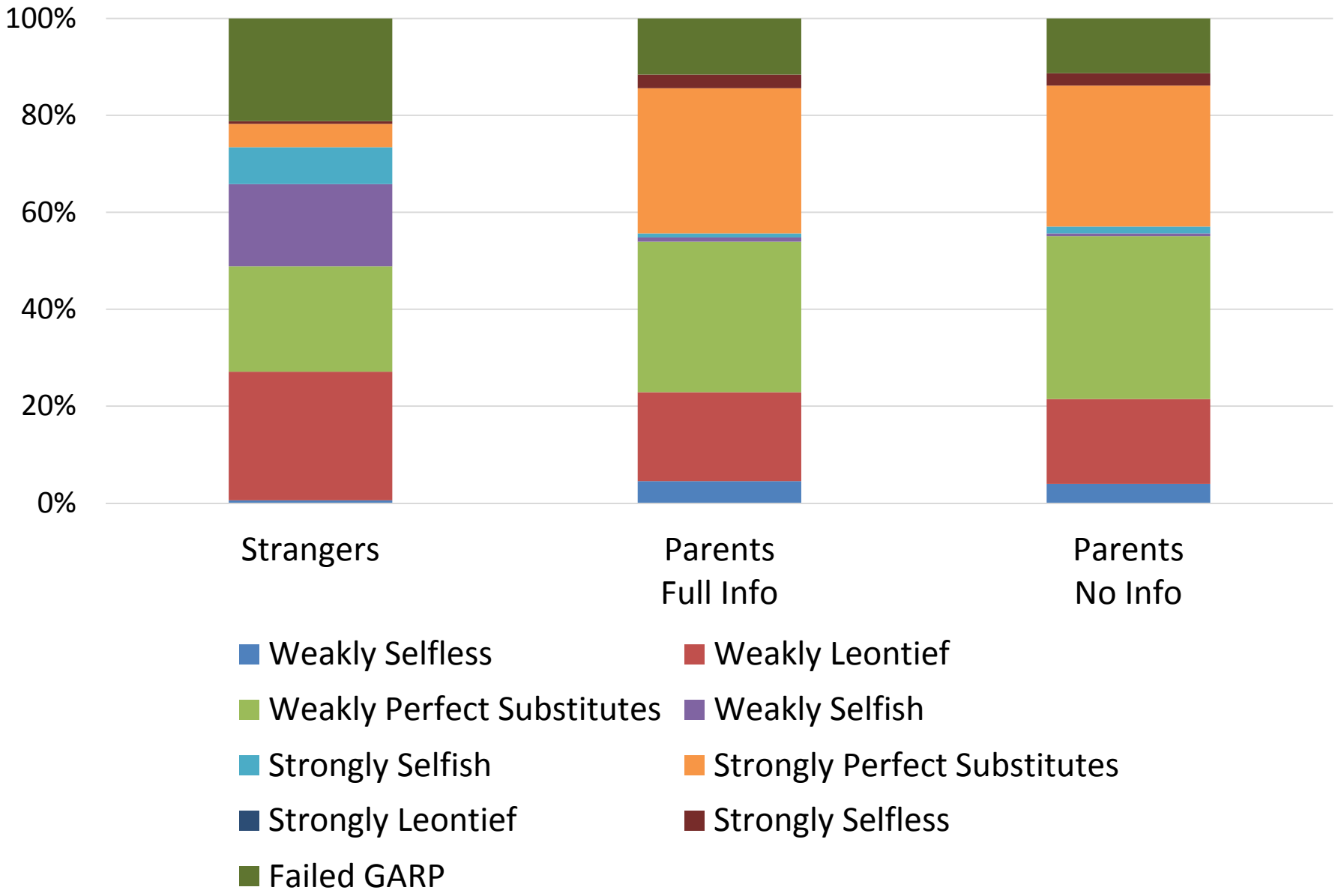


Figure 3. Distribution of Preference Types



Claim Ticket Number _____

Appendix: Experimental Procedures

INSTRUCTIONS

Welcome

Thank you for agreeing to participate in this experiment. The entire experiment will have three rounds of the game and should take approximately one hour. A brief survey will follow the experiment.

This is an experiment about how people make decisions. You will be paid for participating, and the amount of money you will earn depends on the decisions you make. Your payment will come from two parts: the payment of filling the questionnaire will be paid immediately after the experiment, and the payment of playing games will be paid by China postal savings remittance. We will randomly select one round of the game to pay you.

A research foundation has provided the funds for this experiment.

Your Identity

You will never be asked to reveal your identity to anyone during the course of the experiment. Your name will never be recorded by anyone. The experimenters will not be able to link you to any of your decisions. In order to keep your decisions private, *please do not reveal your choices to any other participant*.

Claim Ticket

When you entered the lab, you received a ticket with a number on it. This is your Claim Ticket. Each participant has a different number. You may want to verify that the number on your Claim Ticket is the same as the number on the top of this page.

You will present your Claim Ticket to an assistant at the end of the experiment to receive your payment.

***Please remove your Claim Ticket now and put it in a safe place with your payment envelopes*.**

Claim Ticket Number _____

EXPERIMENT – PART A

You are asked to make a series of choices about how to divide a set of tokens between yourself and one other subject in the room. You and the other subject will be paired randomly and you **will not** be told each other's identity.

As you divide the tokens, you and the other subject will each earn money. Each choice you make is similar to the following:

Example: Divide **50** tokens:
Hold _____ tokens at 1 yuan each, and *Pass* _____ tokens at 2 yuan each.

In this choice you must divide 50 tokens. You can keep all the tokens, keep some and pass some, or pass all the tokens. In this example, you will receive 1 yuan for every token you hold, and the other player will receive 2 yuan for every token you pass.

For example, if you hold 50 and pass 0 tokens, you will receive 50 points, or 50 x ¥1 =¥50, and the other player will receive no points and ¥0. If you hold 0 tokens and pass 50, you will receive ¥0 and the other player will receive 50 x ¥2 = ¥100. However, you could choose any number between 0 and 50 to hold. For instance, you could choose to hold 28 tokens and pass 22. In this case you would earn 28 x ¥1 = ¥28, and the other subject would receive 22 x ¥2 = ¥44.

Here is another example:
Example: Divide **40** tokens:
Hold _____ tokens at 3 yuan each, and *Pass* _____ at 1 yuan each.

In this example every token you hold earns you ¥3, and every token you pass earns the other subject ¥1.

Important Note: In all cases you can choose any number to hold and any number to pass, but the number of tokens you hold plus the number of tokens you pass *must* equal the total number of tokens to divide.

Claim Ticket Number _____

EARNING MONEY IN THIS EXPERIMENT

You will be asked to make 11 allocation decisions like the examples we discussed above. We will calculate your payment as follows:

If this part is selected as the payment round, the computer will randomly pair you with another subject in this experiment, and we will select one of your decisions from this part to carry out. From this part, you will then get the tokens you allocated in the 'hold' portion of your decision at the indicated value, and the other subject will get the tokens you allocated on the 'pass' portion of your decision at the indicated value. The earnings from your decision in this part will be recorded.

Next you will be paired again with a different subject in the experiment. This time, the computer will randomly choose one of the other subject's decisions from this part to carry out. You will earn the tokens allocated in the 'pass' portion from this part at the indicated values. Your earnings from this pairing will also be recorded.

A monitor chosen at the beginning of this experiment will verify that all of these payments are mailed out at the end of the session.

Then please scan the QR code on the screen and finish the 11 questions. When you have completed all your options, submit your answers. Note that the changes will not be made after the submission

Thank you very much for your participation.

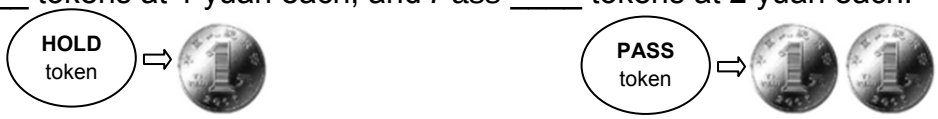
Claim Ticket Number _____

DECISION SHEET – PART A

Directions: Please fill in all the blanks below. Click on the calculator button to see how much you and the recipient will each be paid as a result of your decision. Feel free to make changes to your decisions until you are pleased with the payment allocations. By clicking on the calculator button, you will also be told if you have allocated more tokens than are available. Please answer all questions. Please note that once you click on the Finish button below, you will not be able to change your answers.

1. Divide **40** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 3 yuan each.

2. Divide **40** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.



3. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

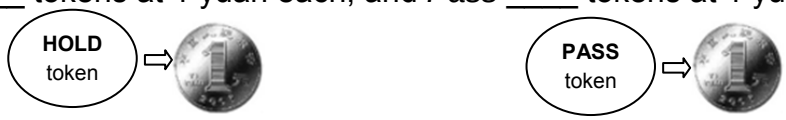
4. Divide **75** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

5. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.

6. Divide **80** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.

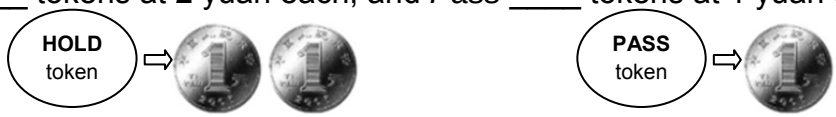
Claim Ticket Number _____

7. Divide **100** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.



8. Divide **60** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.

9. Divide **75** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.



10. Divide **40** tokens:
    Hold ____ tokens at 3 yuan each, and *Pass* ____ tokens at 1 yuan each.

11. Divide **40** tokens:
    Hold ____ tokens at 4 yuan each, and *Pass* ____ tokens at 1 yuan each.

Claim Ticket Number _____

EXPERIMENT – PART B

You are asked to make a series of choices about how to divide a set of tokens between yourself and your parent(s). Please note that if both of your parents are living and live at separate addresses, we ask that you divide these tokens with your mother.

As you divide the tokens, you and your parent(s) will each earn money. Each choice you make is similar to the following:

Example: Divide **50** tokens:
Hold _____ tokens at 1 yuan each, and *Pass* _____ tokens at 2 yuan each.

In this choice you must divide 50 tokens. You can keep all the tokens, keep some and pass some, or pass all the tokens. In this example, you will receive 1 yuan for every token you hold, and the other player will receive 2 yuan for every token you pass.

For example, if you hold 50 and pass 0 tokens, you will receive 50 points, or 50 x ¥1 =¥50, and the other player will receive no points and ¥0. If you hold 0 tokens and pass 50, you will receive ¥0 and the other player will receive 50 x ¥2 = ¥100. However, you could choose any number between 0 and 50 to hold. For instance, you could choose to hold 28 tokens and pass 22. In this case you would earn 28 x ¥1 = ¥28, and the other subject would receive 22 x ¥2 = ¥44.

Here is another example:
Example: Divide **40** tokens:
Hold _____ tokens at 3 yuan each, and *Pass* _____ at 1 yuan each.

In this example every token you hold earns you ¥3, and every token you pass earns the other subject ¥1.

Important Note: In all cases you can choose any number to hold and any number to pass, but the number of tokens you hold plus the number of tokens you pass *must* equal the total number of tokens to divide.

Claim Ticket Number _____

EARNING MONEY IN THIS EXPERIMENT

You will be asked to make 11 allocation decisions like the examples we have just discussed. We will calculate your payment as follows:

The computer will select one of your decisions to carry out. You will then get the tokens you allocated in the 'hold' portion of your decision at the indicated value, and your parent(s) will get the tokens you allocated on the 'pass' portion of your decision at the indicated value. The earnings from your decision in this part will be recorded.

If this part is selected as the payment round, we will send you and your parent a China postal saving money order with this total amount on the card in the envelope addressed to you and your parent. You will present your addressed brown envelope with the opening facing upwards so that the assistant cannot see your name and address on it. You will verify that the correct payment amount has been recorded beside the number on the money order being mailed to you and your parent, and sign a receipt for this payment.

If this part is selected as the payment round, all participants' parents will receive a letter regardless of whether or not a payment is made.

The letter that will be mailed to your parent(s) is enclosed here. Please read this letter and return it to the experimenter when instructed to do so. Your parent(s) will also receive a printed copy of all of the decisions you have made in this part. This will be placed in an envelope to be collected with your payment to ensure your privacy. You may review this before placing the letter and decision sheet in the white envelope addressed to your parent(s).

Then please scan the QR code on the screen and finish the 11 questions. When you have completed all your options, submit your answers. Note that the changes will not be made after the submission

Thank you very much for your participation.

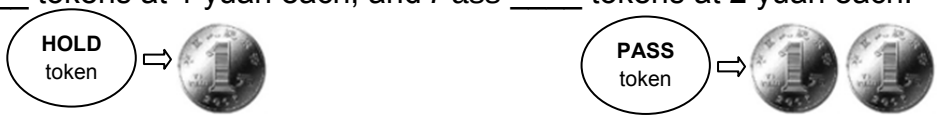
Claim Ticket Number _____

DECISION SHEET – PART B

Directions: Please fill in all the blanks below. Click on the calculator button to see how much you and the recipient will each be paid as a result of your decision. Feel free to make changes to your decisions until you are pleased with the payment allocations. By clicking on the calculator button, you will also be told if you have allocated more tokens than are available. Please answer all questions. Please note that once you click on the Finish button below, you will not be able to change your answers.

1. Divide **40** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 3 yuan each.

2. Divide **40** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

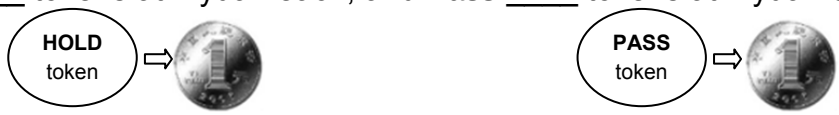


3. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

4. Divide **75** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

5. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.

6. Divide **80** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.



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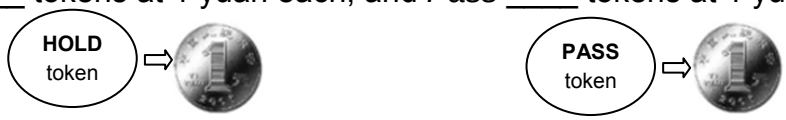
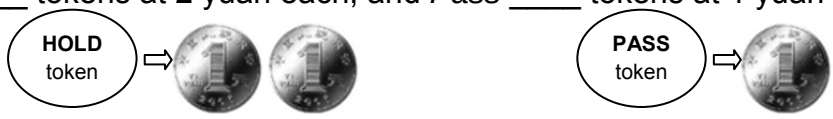
7. Divide **100** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.



8. Divide **60** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.

9. Divide **75** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.



10. Divide **40** tokens:
    Hold ____ tokens at 3 yuan each, and *Pass* ____ tokens at 1 yuan each.

11. Divide **40** tokens:
    Hold ____ tokens at 4 yuan each, and *Pass* ____ tokens at 1 yuan each.

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EXPERIMENT – PART C

You are asked to make a series of choices about how to divide a set of tokens between yourself and your parent(s). Please note that if both of your parents are living and live at separate addresses, we ask that you divide these tokens with your mother.

As you divide the tokens, you and your parent(s) will each earn money. Each choice you make is similar to the following:

Example: Divide **50** tokens:
Hold _____ tokens at 1 yuan each, and *Pass* _____ tokens at 2 yuan each.

In this choice you must divide 50 tokens. You can keep all the tokens, keep some and pass some, or pass all the tokens. In this example, you will receive 1 yuan for every token you hold, and the other player will receive 2 yuan for every token you pass.

For example, if you hold 50 and pass 0 tokens, you will receive 50 points, or 50 x ¥1 =¥50, and the other player will receive no points and ¥0. If you hold 0 tokens and pass 50, you will receive ¥0 and the other player will receive 50 x ¥2 = ¥100. However, you could choose any number between 0 and 50 to hold. For instance, you could choose to hold 28 tokens and pass 22. In this case you would earn 28 x ¥1 = ¥28, and the other subject would receive 22 x ¥2 = ¥44.

Here is another example:
Example: Divide **40** tokens:
Hold _____ tokens at 3 yuan each, and *Pass* _____ at 1 yuan each.

In this example every token you hold earns you ¥3, and every token you pass earns the other subject ¥1.

Important Note: In all cases you can choose any number to hold and any number to pass, but the number of tokens you hold plus the number of tokens you pass *must* equal the total number of tokens to divide.

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EARNING MONEY IN THIS EXPERIMENT

You will be asked to make 11 allocation decisions like the examples we have just discussed. We will calculate your payment as follows:

The computer will select one of your decisions to carry out. You will then get the tokens you allocated in the 'hold' portion of your decision at the indicated value, and your parent(s) will get the tokens you allocated on the 'pass' portion of your decision at the indicated value. The earnings from your decision in this part will be recorded.

If this part is selected as the payment round, we will send you and your parent a China postal saving money order with this total amount on the card in the envelope addressed to you and your parent.

If this part is selected as the payment round, all participants' parents will receive a letter regardless of whether or not a payment is made. Please read this letter and return it to the experimenter when instructed to do so. This time we will not tell your parents about detail information about the experiment and your parent(s) will not receive a printed copy of all of the decisions you have made in this part.

Then please scan the QR code on the screen and finish the 11 questions. When you have completed all your options, submit your answers. Note that the changes will not be made after the submission

Thank you very much for your participation.

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DECISION SHEET – PART C

Directions: Please fill in all the blanks below. Click on the calculator button to see how much you and the recipient will each be paid as a result of your decision. Feel free to make changes to your decisions until you are pleased with the payment allocations. By clicking on the calculator button, you will also be told if you have allocated more tokens than are available. Please answer all questions. Please note that once you click on the Finish button below, you will not be able to change your answers.

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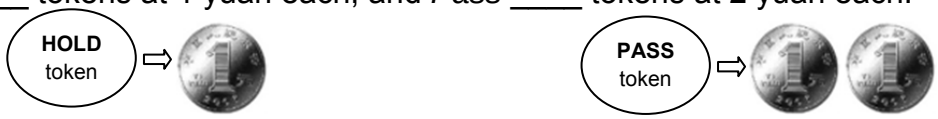
2. Divide **40** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.



3. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

4. Divide **75** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 2 yuan each.

5. Divide **60** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.

6. Divide **80** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.

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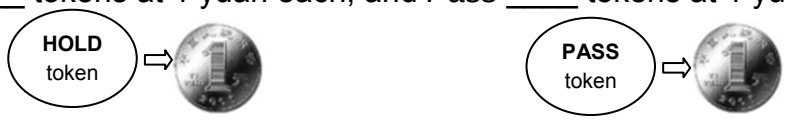
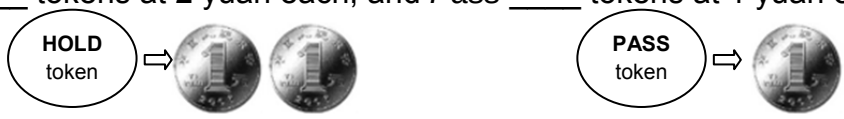
7. Divide **100** tokens:
   Hold ____ tokens at 1 yuan each, and *Pass* ____ tokens at 1 yuan each.



8. Divide **60** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.

9. Divide **75** tokens:
   Hold ____ tokens at 2 yuan each, and *Pass* ____ tokens at 1 yuan each.



10. Divide **40** tokens:
    Hold ____ tokens at 3 yuan each, and *Pass* ____ tokens at 1 yuan each.

11. Divide **40** tokens:
    Hold ____ tokens at 4 yuan each, and *Pass* ____ tokens at 1 yuan each.