Measuring the impact of interaction between children of a matrilineal and a patriarchal culture on gender differences in risk aversion

Elaine M. Liu[a,b,1,2] and Sharon Xuejing Zuo[c,2]

[a]Department of Economics, University of Houston, Houston, TX 77004; [b]National Bureau of Economic Research (NBER), Cambridge, MA 02138; and [c]School of Economics, Fudan University, 200433 Shanghai, China

Many studies find that women are more risk averse than men. Why does such a gender gap exist, and how malleable is this gender gap in risk aversion? The paper takes advantage of a rare setting in which children of the matrilineal Mosuo and the traditionally patriarchal Han attend the same schools in Yunnan, China to shed light on these questions. In particular, we exploit the fact that children would experience a shock in gender norms when they start to intermingle with children from other ethnic groups with the opposite gender norms at school. Using survey and field experiments, we elicit risk attitudes from Mosuo and Han elementary and middle school students. We find that, at the time when they first enter school, Mosuo and Han children exhibit opposite gender norms—Mosuo girls take more risks than Mosuo boys, while Han girls are more risk averse than Han boys, reflecting cultural differences. However, after Mosuo students spend more time with Han students, Mosuo girls become more and more risk averse. By age 11, Mosuo girls are also more risk averse than Mosuo boys. We also observe a shrinking gap in risk aversion for Han over time. Using random roommate assignment for boarding middle school students, we find Mosuo boys who have fewer Mosuo roommates behave more similarly to Han boys. This shows that risk preferences are shaped by culture and malleable in response to new environments.

gender norm | risk | socialization | peer | culture

Many studies have found women to be more risk averse than men [see the handbook chapter by Eckel and Grossman (1)]. Several have suggested that this difference in attitudes toward risk taking could partially explain the difference in career choices between men and women, which could, in turn, lead to the gender wage gap (2, 3). Given the observed gender difference in risk attitudes and the importance of risk attitudes, it is necessary to understand the origin of these gaps. Are these biological differences, or are they the result of social environment? Furthermore, if they are a result of the surrounding social environment, how malleable is this gender gap in risk preference, and what mechanisms could affect risk attitudes?

This paper seeks to answer these questions by studying the risk-taking behaviors among the children of two ethnic groups in Yunnan, China with nearly opposite gender norms. Yunnan provides us with a rare setting in which children of the matrilineal Mosuo and the traditionally patriarchal Han attend the same schools.* Within this setting, we examine how intermingling between children from these disparate cultural backgrounds affects their respective gendered behavior. According to Berry et al. (4), a child can choose to maintain his/her own cultural heritage, choose to adapt to the other culture, or both. Therefore, it is unclear whether socialization with groups of opposite gender norms enhances or reduces the gender differences in risk attitudes.

The Mosuo and Han differ in many ways, but most notably, they have distinctly different gender norms. The Mosuo are the only ethnic minority group in China that maintains a matrilineal culture.† A Mosuo family typically includes members bound by the ties of maternal kin, with the grandmother generally being the household head. Grandmothers, maternal granduncles, mothers, mothers' brothers, mothers' sisters, and children live in the same household (6, 7). Mosuo children are raised by the mother's household, and

Significance

Studies show that women are more risk averse than men. We explore sources and malleability of such differences in a setting where children of two culturally distinct populations, the matrilineal Mosuo and the traditionally patriarchal Han, come together to attend school. Using survey and field experiments, we elicit individual risk attitudes from elementary and middle school students from the two populations. When they first enter school, Mosuo girls take more risks than Mosuo boys, while Han girls are more risk averse than Han boys, reflecting cultural differences. However, after spending time in the majority-Han environment, Mosuo children adopt the risk preferences of the majority. This shows that risk preferences are shaped by culture and malleable in response to new environments.

*Our paper studies the socialization between matrilineal and patriarchal children and how the interaction affects their behaviors. There are papers that have drawn matrilineal and patriarchal children from two different communities and examined them separately, but these studies have not examined the interaction.

†We use the term matrilineal, since according to Campbell (5), there is no true matriarchal society in the world, and more recent anthropological work refers to Mosuo as a matrilineal society.
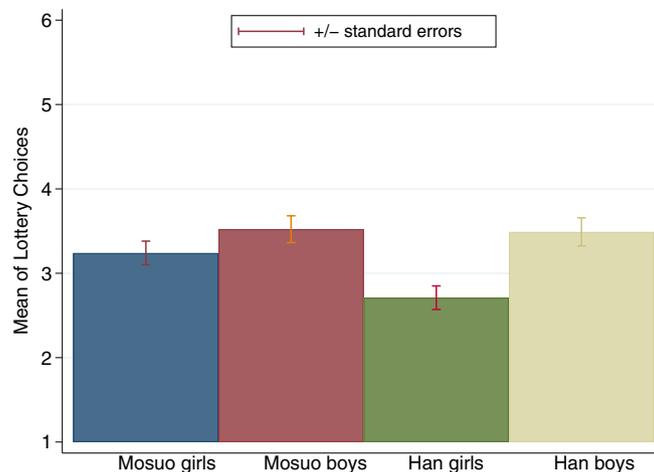
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Fig. 1. The means of the lottery choices for each ethnic–gender group.

the children's father is often excluded from the household. In Mosuo society, women play an important role in the family decision making, which includes household labor arrangement, crop choices, and spending decisions (8). According to Shih (7) and Walsh (9), women in this society enjoy a social status that is higher than or equal to men. There is very limited evidence on why a matrilineal culture would promote risk-taking behaviors among women. One study has found a positive relationship between agriculture income and reproductive success (i.e., number of surviving children) of Mosuo women (10). Therefore, since Mosuo women are often the head of the household, risk-taking behaviors, which could lead to higher income, could be rewarding. An experimental economic paper by Gong and Yang (11) also rationalizes that Mosuo women (men) have more (less) economic responsibility and have more support from their maternal family; hence, they can take on more risk than other cultures.

Conversely, Han Chinese have been influenced by Confucianism for thousands of years. The traditional Han family system is patriarchal and patrilineal. The household head of the family is typically the oldest male, who is responsible for major decisions. Kinship in Han families is passed down through the male descent line: sons and their male offspring continue the family name, and they are expected to support their aging parents (12). Women's status is traditionally subordinate to men. Although the Cultural Revolution in the 1960s challenged these traditional values, some vestiges of male dominance in Han culture remain (13). For example, the prevalence of sex-selected abortion due to a preference for sons is one piece of evidence that patriarchal and patrilineal influences are ingrained in Han culture (14).

For this study, we visited Yongning Township located in Ninglang County, Yunnan Province. Yongning has the largest Mosuo population. In this township, Mosuo and Han children attend the same schools, are taught by the same teachers, and interact daily. We conduct surveys and elicit risk preference of Mosuo and Han elementary and middle school children using incentivized experiments.

Sample Selection and Experimental Setup

In Yongning Township, we selected the four elementary schools with the greatest numbers of Mosuo students to conduct our experiments and surveys. These grades 1–5 schools[‡] are usually small, with about 10–30 students and just one class per grade. Despite the fact that these schools have the most Mosuo students of any school in the region, Mosuo are still a minority in most grades. The mean share of Mosuo students at school–grade–year level is 40%.[§] We studied all first- to fifth-grade Mosuo and Han children: totals of 185 and 167 elementary students in 2015 and 2016, respectively.

We also selected students from the only middle school in the township. Our analysis focused on seventh-grade students for reasons that are explained in *SI Appendix*. Due to budget constraints, of approximately 240 seventh-grade students, we randomly selected roughly 80 Han and Mosuo students each year to participate in our survey/experiment stratified by gender and ethnicity. The characteristics of these elementary and middle school students are described in *SI Appendix*, Table S1. Mosuo tend to have bigger families than Han, which is likely due to their family structure. Mosuo students also report having higher allowances than Han, but the difference is not statistically significant.

One might question whether parents can select the school that their children attend based on their preference for cultural assimilation. In this particular setting in China, this type of sorting is nearly impossible, since the school assigned is based on one's hukou (household registration), which is defined at birth and is passed on by one's parents' status (16). Switching hukou in the rural area from one address to another is extremely difficult, since the land/residence is centrally assigned at the village level.

We collected survey data and used techniques from experimental economics to elicit risk attitudes. The risk experiment that we conducted is an incentivized lottery choice game from the experimental economic literature. This protocol, which is modeled after the works of Eckel and Grossman (17) and Binswanger (18), has been used by economists when the subjects are less educated. Each student can choose only one of the six lotteries presented, and their choice is not seen by their classmates. Students are instructed

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[‡]In poor rural areas, most students do not attend kindergarten before first grade. For sixth grade, students from these four smaller schools attend another elementary school along with students from other elementary schools. The school with sixth grade is not one of the chosen schools; hence, we only have first to fifth graders and the seventh graders from middle school.

[§]Yi (patriarchal society) is the largest minority group in Ninglang County; however, two of the four elementary schools that we visited have no Yi students. Therefore, unlike other works by Gong and Yang (11) and Zhang (15), which compare risk-taking/competitiveness behaviors of Yi and Mosuo adults/high school students, we decided not to use Yi students as subjects in our paper.
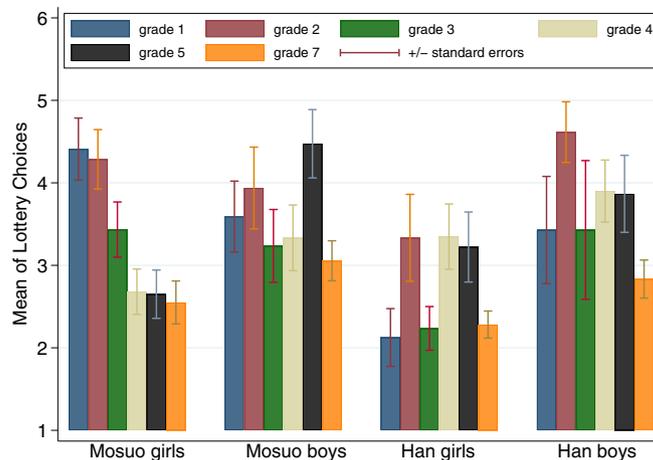
Fig. 2. The means of the lottery choices for each ethnic–gender group by grade.

that, at the end of the experiment, they will be paid a certain amount based on their choice and the color of the ball that they draw. Each lottery has a 50/50 chance of winning high or low awards. The six possible lottery choices are (3, 3), (2.5, 5), (2, 6), (1.5, 7.5), (0.5, 9), and (0, 10). The lottery choices are monotonically increasing in expected payoff and variance (presented in *SI Appendix*, Table S2). Most risk-averse individuals would choose lottery number 1 so that they would always win 3 yuan. The biggest risk takers would choose lottery number 6, indicating a 50/50 chance of winning either 0 or 10 yuan. The lower the number of their lottery choice, the more risk averse they are. We consulted local school principals to decide on the amount of reward used in this design. With 10 yuan, a child would buy five notebooks or four to five popsicles in a local shop. The experimental script and the protocol are presented and discussed in *SI Appendix*. The study was approved by the IRB (IRB-15254-01 and 16169-02) at the University of Houston. All participants and their parents gave informed consent in accordance with the policies of the IRB.

Some may worry that these children may not understand the lottery task, especially since earlier works found that even some adults have exhibited behaviors that are inconsistent with rational decision making under risk (19). To enhance subjects' understanding, we have done the following. First, we conducted two rounds of pilot experiments with children of similar age in a nearby region and modified our protocol based on the feedback from each round. Second, based on the suggestions of local math teachers, we drew the pictures of the payoff table on the blackboard while explaining the protocol verbally. We showed students the ping-pong balls and the bag that they were going to draw from, and we used a couple rounds of demonstrations, explaining the payoff for selected choices, to enhance their understanding.¶

Descriptive Results

Fig. 1 presents the mean of lottery choices by ethnicity and gender of both the elementary and middle school data. The mean of lottery choices of Han girls is lower than that of Han boys, indicating that Han girls are more risk averse than Han boys (Mann–Whitney *U* test *P* value = 0.001). While Mosuo girls are also more risk averse than Mosuo boys, the difference is much smaller than for Han and is not statistically significant (comparing Mosuo males and females, *P* value = 0.18). This figure ignores the wide variation in lottery choices across age groups. In Fig. 2, we break down the mean lottery choices by grade, ethnicity, and gender, which uncovers a few striking patterns. Mosuo first-grade boys are more risk averse than Mosuo first-grade girls (*P* value = 0.19), but Mosuo girls become increasingly risk averse as they progress through school. We do not see the same pattern among Han girls, which suggests that becoming more risk averse as one ages is not due to genetics. Mosuo girls eventually become more risk averse than Mosuo boys by the fifth grade (*P* value = 0.002). Conversely, Han girls are more risk averse than Han boys in all grades (but this is not statistically significant at the 10% level).# We report Mann–Whitney *U* tests for each grade between males and females in *SI Appendix*, Table S3. We also test whether there are differences in risk attitudes between Mosuo and Han. We find that Mosuo girls are more risk loving than Han girls between the first and third grades (*P* value = 0.006 for the first grade, and *P* value = 0.027 for the third grade), but by the fourth and fifth grades, they have become more similar, and there are no statistically significant differences in their distributions. There are no differences between Mosuo boys and Han boys across all grades. The Mann–Whitney *U* test results between Mosuo and Han are reported in *SI Appendix*, Table S4. In *SI Appendix*, Fig. S1, we provide more details on frequency distribution of choices by grade, ethnicity, and gender.

Regression Analysis

Pooling both the elementary school and middle school data, we use a regression analysis to first examine whether there is a gender gap for the Mosuo and Han. The regression result is in *SI Appendix*, Table S5. Controlling for age, year, and school fixed effects, we find that, while Han girls are more risk averse than Han boys (*P* value = 0.001), Mosuo girls and boys have similar levels of risk attitudes (*P* value = 0.17). This finding echoes the finding in Gneezy et al. (20), where they find that adult women in a matrilineal society behave similarly to adult males in competitiveness but that adult women in a patriarchal society are less inclined to compete compared with adult males. We hypothesize that, while children initially learn from their parents, over time parental influence wanes,

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¶In *SI Appendix*, we describe the pilot experiments and how we decided to use the Eckel and Grossman protocol.

#In *SI Appendix*, we provide several other figures, including the mean choice by age–ethnicity–gender (*SI Appendix*, Fig. S2) and the median choice by grade–ethnicity–gender (*SI Appendix*, Fig. S3). These figures display the same pattern that Mosuo girls become more risk averse gradually.
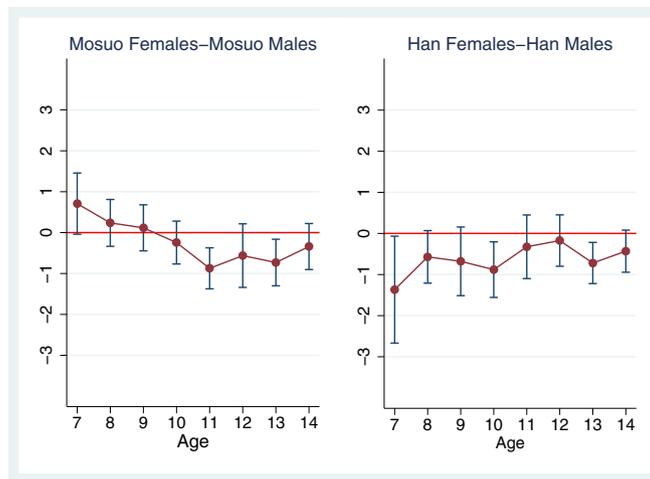
Fig. 3. The ordered probit estimated coefficients from Eq. **1** for Han and Mosuo students with 90% confidence intervals. The dependent variable is the lottery choices. A positive coefficient indicates that females have higher attitudes toward risk loving than males.

and they become influenced by their friends and other environmental factors. We examine how the gender gap evolves over age using the following specification.

For each student i at age g in year t,

$$Y_{igt} = \alpha + \sum_{g=7}^{14} \beta_g Female_i \times g + \tau_g + \delta_t + \varepsilon_{igt}. \qquad [1]$$

Y_{igt} indicates the student's choice in the experiment. It is a discrete lottery choice ranging from one to six, which is an ordered index based on one's underlying risk attitudes, with the bigger number indicating a higher preference for riskier choice. $Female_i$ is a dummy variable. We run this regression using an ordered probit model separately for Mosuo and Han. τ_g and δ_t are age and year fixed effects, respectively. The coefficient β_g, which reflects the gender gap in risk preferences, is presented in Fig. 3. Each dot in Fig. 3 shows the coefficient β_g, the gender gap in risk attitudes, for a given grade g and a given ethnicity. A positive β_g suggests that females are less risk averse than males. It is difficult to interpret the magnitude of coefficients in this regression, since the dependent variable is ordinal; thus, our discussion is focused on the signs and relative magnitude of the coefficients. There are 2 children who are under age 7 and 15 children who are above age 14; we record them as ages 7 and 14, respectively.

We find that, at age 7, Mosuo boys are slightly more risk averse than Mosuo girls, but this difference is not statistically significant (P value = 0.12). This gender gap narrows and eventually reverses the sign by age 11 (P value = 0.004). Could the changes in the direction of the gender gap among Mosuo be biological? Specifically, do girls become more risk averse as they age, and is this rate faster than for boys? Genetics is unlikely to be the cause, since we do not observe the same pattern among the Han children. In Fig. 3, *Right*, in contrast, we find that Han girls are more risk averse than Han boys (P value for age 7 = 0.08 and P value for age 10 = 0.03), but this gender gap is narrowing over time. By 11 and 12, the gender gap becomes statistically indifferent from zero. We want to highlight that, in this figure, age is generally a reflection of student's exposure to the other culture. The older they are, the more time that they would have spent with children from the other ethnic group, except for the middle school Han sample (age 13–14). Most of these Han students attended elementary schools with very few Mosuo; thus, they, on average, would have less exposure to Mosuo than the elementary school Han sample. This does not affect the interpretation for Mosuo, since if anything, the average Mosuo in middle school should have had more exposure to Han than the elementary school sample.‖ Many reasons could contribute to the emergence of this pattern. For example, it could be due to mainstream media, since all children might be watching similar TV shows, which are predominantly Han. Also, it could be due to the way that teachers treat students. Unfortunately, we cannot investigate these separate effects in the elementary school setting. In theory, a teacher would follow the same grade cohort throughout elementary school. However, in reality, many teachers switch teaching assignments among themselves, and a student could have a different teacher in a different grade. It is difficult to decipher the influence of teachers or media for the purposes of this study, but we can examine the importance of peers in the next section.

Peer Effects in Elementary Schools. In the elementary school sample, we can construct a school–grade-specific cohort level of Mosuo share. Nearly one-third of students in the sample are in a cohort where Mosuo is in the majority. We exploit this variation to examine whether being in the Mosuo majority vs. the Mosuo minority cohort would result in a different progression in risk attitudes for Mosuo and Han students separately. Our regression specification is as follows.

For individual i in a given school–grade cohort c,

$$\begin{aligned} Y_{ic} = \gamma_0 &+ \gamma_1 Age_i + \gamma_2 Mosuo_i + \gamma_3 MosuoMinority_c \\ &+ \gamma_4 Age_i \times Mosuo_i + \gamma_5 Age_i \times MosuoMinority_c \\ &+ \gamma_6 MosuoMinority_c \times Mosuo_i + \gamma_7 Age_i \times MosuoMinority_c \times Mosuo_i + \varepsilon_{ic}. \end{aligned} \qquad [2]$$

‖ In *SI Appendix*, we present the same estimation but by school–grade (*SI Appendix*, Fig. S4). We also present the gap between Mosuo and Han by gender–age in *SI Appendix*, Fig. S5.

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Table 1. Peer effects in elementary schools

Ethnicity and cohort composition	Girls	Boys
Mosuo in a Mosuo majority cohort, $\gamma_1 + \gamma_4$	−0.183* [52]	−0.287* [41]
Mosuo in a Mosuo minority cohort, $\gamma_1 + \gamma_4 + \gamma_5 + \gamma_7$	−0.345† [66]	0.302† [56]
Han in a Mosuo majority cohort, γ_1	0.452* [15]	1.427‡ [10]
Han in a Mosuo minority cohort, $\gamma_1 + \gamma_5$	0.127 [60]	−0.006 [52]
Mosuo × Mosuo majority = Mosuo × Mosuo minority	0.237	0.001
Han × Mosuo majority = Han × Mosuo minority	0.225	0.002

Regression results are reported in *SI Appendix*, Table S6. Sample sizes for each of the group are presented in brackets. Mosuo majority (minority) equals one if a student is in the school–grade cohort in which more (less) than 50% of his/her cohort members are Mosuo. A positive coefficient indicates that one becomes less risk averse. In rows 4 and 5, P values from the test for equality are reported.
*Significant at 10%.
†Significant at 5%.
‡Significant at 1%.

We run this regression separately for boys and girls. $Mosuo_i$ equals one if individual i is a Mosuo. Age_i is the age of individual i. $MosuoMinority_c$ is one if less than 50% of individual i's cohort are Mosuo. The entire regression result is reported in *SI Appendix*, Table S6, and we also presented a version of this regression with grade instead of age interaction in *SI Appendix*, Table S7. To ease the interpretation for the readers, we present the total effect of having one more year of exposure to other culture for each of the subethnic–gender groups in Table 1. We find a few interesting patterns. Mosuo girls become more risk averse over time regardless of whether they are in a Mosuo majority or a Mosuo minority cohort. This suggests that there could be other environmental factors (e.g., mainstream Han media) that also influence Mosuo girls' behavior other than the peer effect. More importantly, $\gamma_1 + \gamma_4 + \gamma_5 + \gamma_7$ is nearly two times larger than $\gamma_1 + \gamma_4$, which indicates that having more Han peers would cause Mosuo girls to become more risk averse over time. In contrast, when Han girls are in a Mosuo majority cohort, they become less risk averse over time, and the magnitude is nearly four times larger than if they were in a Mosuo minority cohort. When Mosuo boys are in a Mosuo minority cohort, they become less risk averse over time. When they are in a Mosuo majority cohort, they remain more risk averse. For Han girls and Han boys in Mosuo minority cohorts, they seem to be rather unaffected by the Mosuo peers. There is no statistically significant change over time. However, one odd pattern that we observe here is that, when Han boys spend time in a Mosuo majority cohort, they behave a lot more risk loving. One possibility is that, when Han boys become the minority, they choose to focus on their own culture and to isolate themselves from Mosuo. However, we should note that this is probably an issue with small sample size. There are only 10 Han boys in the Mosuo majority cohorts (5 are in the third grade and 5 in the fourth grade), and therefore, the result is only suggestive.

Peer Effects in Middle School. In China, middle school education is compulsory. Yongning Township has only one middle school. According to local records (Annual Statistical Communiqu), the enrollment rate is 98%. Because of the location of the school and the distance from the students' homes, about 80% of students board in the middle school and only go home on weekends. There are four classes in each grade and roughly 60 people per class. Roommates are randomly assigned among the boarded students within a class, and the random roommate assignments provide us with a good opportunity to examine peer effects of the exposure to roommates of other ethnicities.** The median size of each dorm room is 12 students, and students stay with the same roommates for 1 y. *SI Appendix*, Fig. S6 shows the percentage of non-Mosuo seventh-grade students in each room. We try to understand how sharing a room with non-Mosuo students would affect one's risk attitudes. The main specification is as follows.

For a student i,

$$Y_i = \beta_0 + \beta_1 Female_i \times Mosuo_i \times \Delta_i + \beta_2 Female_i \times \Delta_i \qquad [3]$$
$$+ \beta_3 Mosuo_i \times \Delta_i + \beta_4 Female_i \times Mosuo_i + \beta_5 \Delta_i + \beta_6 Female_i + \beta_7 Mosuo_i + \varepsilon_i.$$

Δ_i is the share of the non-Mosuo roommates in each dorm room, which is imputed as the number of non-Mosuo roommates divided by the total number of roommates. Results from Eq. **3** are reported in column 2 of *SI Appendix*, Table S8. To ease the interpretations of the results, we present the total effects of the change of non-Mosuo share by one SD on each of the four groups in column 2 of Table 2. It shows that, when Mosuo males have more non-Mosuo roommates, they become less risk averse, and the level is significant at 5%. The effects of roommates on Mosuo females, Han females, and Han males are insignificant. Given the small sample size, we are concerned that the lack of significance may be due to the lack of power, and therefore, we perform a power calculation to back out the sample size needed to detect the significance at the 10% level with 80% power using the coefficients in *SI Appendix*, Table S7. For Han females, the sample size needed is 250, whereas for Han males and Mosuo females, it would require at least 5,000 observations. In other words, we can conclude that there is very little to no impact on Han males and Mosuo females after they share rooms with non-Mosuo roommates for one semester, but it is less conclusive for Han females. There could be a few potential explanations for why Mosuo females are less affected than Mosuo males in middle school. From our earlier finding, Mosuo females have already changed their behavior and become more risk averse in elementary schools. The extent to which their behaviors can further change is limited, especially in the field experiment setting where the lottery choices are limited.

We conducted two rounds of experiments in 2 sequential years, but we only collected "best friends" information in the first round. We asked students to provide us the names of their three best friends, and we matched their friends' ethnicity using administrative

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**We check whether roommate characteristics vary with one's characteristics. We find that the share of non-Mosuo roommates is not correlated with the mother's education level and one's test score.

Table 2. Peer effects in middle school

Ethnic–gender group	Share of non-Mosuo roommates goes up by one SD (15%)	All three best friends are non-Mosuo
Mosuo female, $\beta_1 + \beta_2 + \beta_3 + \beta_4$	0.011	0.367
Mosuo male, $\beta_3 + \beta_4$	0.765*	0.828†
Han female, $\beta_2 + \beta_4$	−0.172	−0.502
Han male, β_4	−0.045	−0.170
N	129	49

Regression results are reported in *SI Appendix*, Table S8. This table presents the effects of △ changes from zero to one for each of the given ethnic–gender groups. A positive coefficient indicates that one become less risk averse.
*Significant at 1%.
†Significant at 5%.

records. Unlike the roommate assignment, one's choice of friends is not random. Mosuo students with more affinity toward Han culture could have more Han friends; therefore, our estimates could be biased. Nevertheless, it is still interesting to explore whether there is any close friend effect. In Eq. **3**, we replace Δ_i with a dummy variable indicating whether all three best friends are non-Mosuo, and the results are reported in column 3 of Table 2 and *SI Appendix*, Table S8. Similar to the results on roommates, we also find that Mosuo males are more likely to be less risk averse if all of their best friends are non-Mosuo.

Discussion

Our analysis makes several contributions to the literature. Our work speaks to the literature on the origin and the fluidity of gender gaps in risk attitudes. Our findings echo the past literature, which suggests that gender differences in risk preferences could be shaped by the environment or culture (21–23). In consideration of our finding that sharing a room with more Han roommates or having Han classmates for a few years could change the risk-taking behaviors of Mosuo students, our work provides empirical evidence that gendered behaviors are malleable at a formative age.

Our work provides some evidence of cultural transmission from parent to child, since both Mosuo and Han first graders have gendered behavior that conforms with that of their parents' culture. This is in line with past findings in the papers by Fernández et al. (24) and Fernandez and Fogli (25), which complement the vast literature on the importance of cultural norms and how it affects decision making, economic outcomes, and gender norms [e.g., the works by Heine and Ruby (26), Henrich et al. (27), and Alesina et al. (28)]. We also provide empirical evidence that socialization causes children's behavior to diverge from their own cultural norms. This echoes the seminal works by Boyd and Richerson (29) and Cavalli-Sforza and Feldman (30) and the theoretical model proposed by Bisin and Verdier (31).

We examine one important mechanism through which socialization affects individual preferences—the peer effect. To the best of our knowledge, there are many studies that examine how socialization affects individual behaviors, and many of these exploited similar identification strategies, such as random roommate assignment or random cohort variation. While most of this literature focuses on outcomes, including academic performance, classroom disruption, violent behaviors, drinking behaviors, and illicit drug use (32–34), none have studied how peers from different ethnic groups and opposite gender norms could affect one's own gender norms.

Lastly, our work also speaks to the literature on cross-culture psychology. When Mosuo and Han children come into contact at school, individuals could experience one or all of the four dimensions of acculturation, such as integration, assimilation, separation, and marginalization (4, 35). It is unclear whether they can become alienated from their own culture. This paper provides a case study where we find evidence that most Mosuo children adopt or mimic Han children's gender norms.

In terms of the challenges and limitation of our study, the main challenge is whether subjects actually understand the game. Suppose that some subjects do not understand the game and have made their choice randomly; then, this is a case of classical measurement error. The difference in risk attitudes between genders would be muted, and it would have biased against finding any statistically significant results. In that case, what we have found could be a lower-bound estimate of the true effects. Alternatively, if subjects who do not understand the game still choose in a way that correlates with our key variables of interest because of some third factors, that could possibly bias our results. We examine this issue in the following ways. First, we test whether there is any systematic pattern that correlates the choices with observables, such as student's test performance, maternal education, or allowance. We test whether students with above and below observable characteristics have the same lottery choice distribution, and we fail to reject the null hypothesis that they have the same distribution. The details of these results are reported in *SI Appendix*, Table S9. Second, given that the key variables of interest, such as the interaction term between age, Mosuo, and being in a Mosuo minority cohort (Eq. **2**) and the interaction term between Mosuo and the share of Mosuo roommates (Eq **3**), are essentially random, it is unlikely that they could be correlated with the unobservable variables.

A related concern is that some children may be too young to value the money given in the game. Various studies suggest that, by 6 and 7 y old, children already know the importance of money because of its purchasing power (36). Furthermore, a significant amount of research shows that children's monetary concepts increase with age without differences between boys and girls (37–39). In our setting, if a given ethnic–gender group has a better understanding of money than others at younger stages, then our results could be biased in Eq. **1**. Work by Furth (40) suggests that numbers and numerical concepts are a necessary foundation for enhancing children's understanding of money; therefore, we regressed math ability (for children in third grade and below) on being Mosuo, female, and Mosuo female, and we do not find any significant correlation between being Mosuo, being female, and math ability (*SI Appendix*, Table S10).

Due to budget and time constraints, we have not examined other important preferences that can also be elicited using experiments, such as competitiveness. We also have not asked about risky behaviors in other domains in the survey. We should also highlight that it is not clear whether the effects that we identify have a sustaining impact or not. It is possible that the change of their behavior is temporary and that they are merely imitating other students or following other role models (e.g., teachers). After the children leave

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schools and return to their villages, they might revert to their parents' gender and culture norms. These are questions worth pursuing in future work.

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