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GENDER DIFFERENCES IN COMPETITION: EVIDENCE FROM A MATRILINEAL AND A PATRIARCHAL SOCIETY

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ABSTRACT

This study uses a controlled experiment to explore whether there are gender differences in selecting into competitive environments across two distinct societies: the Maasai in Tanzania and the Khasi in India. One unique aspect of these societies is that the Maasai represent a textbook example of a patriarchal society whereas the Khasi are matrilineal. Similar to the extant evidence drawn from experiments executed in Western cultures, Maasai men opt to compete at roughly twice the rate as Maasai women. Interestingly, this result is reversed amongst the Khasi, where women choose the competitive environment more often than Khasi men, and even choose to compete weakly more often than Maasai men. We view these results as potentially providing insights into the underpinnings of the factors hypothesized to be determinants of the observed gender differences in selecting into competitive environments.

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I. Introduction

Although women have made important strides in catching up with men in the workplace, a gender gap persists both in wages and in prospects for advancement. Commonly cited explanations for such disparities range from charges of discrimination to claims that women are more sensitive than men to work-family conflicts and therefore are less inclined to make career sacrifices.[1] Combining results from psychology studies (see Campbell (2002) for a review) with recent findings in the experimental economics literature (e.g., Gneezy, Niederle, and Rustichini (2003); Gneezy and Rustichini (2004), Niederle and Vesterlund (2005)), an alternative explanation arises: men are more competitively inclined than women.[2] A stylized fact in this literature is that men and women differ in their propensities to engage in competitive activities, with men opting to compete more often than women, even in tasks where women are more able. Such data patterns might provide insights into why we observe a higher fraction of women than men among, for example, grammar school teachers, but the reverse among CEOs.

An important puzzle in this literature relates to the underlying factors responsible for the observed differences in competitive inclinations. One oft-heard hypothesis is that men and women are innately different (Lawrence (2006)). For example, in discussions concerning why men considerably outnumber women in the sciences, several high profile scholars have argued that men are innately better equipped to compete (see, e.g., Baron-Cohen (2003), Lawrence (2006), and the citations in Barres (2006)). An empirical regularity consistent with this notion is the fact that substantial heterogeneity exists in the

[1] See Altonji and Blank (1999); Blau and Kahn (1992; 2000); Blau, Ferber, and Winkler (2002).
[2] See also Vandegrift, Yavas, and Brown (2004); Gneezy and Rustichini (2005); and Datta, Poulsen, and Villeval (2005).

competitiveness of individuals raised in quite similar environments--see, for example, the discussion of the tendency to compete in bargaining (Shell, 1999).

Nevertheless, the role of nurture, or the fact that culture might be critically linked to competitive inclinations, is also an important consideration. More than a handful of our male readership can likely recall vividly their grammar school physical education teacher scorning them with the proverbial "you're playing like a girl" rant to induce greater levels of competitive spirit. Clearly, however, the explanations might not be competing; rather the nature/nurture interaction might be of utmost importance, either because nurture enables the expression of nature (Ridley 2003, Turkheimer 1998, 2003), or because nature and nurture co-evolve (Boyd and Richerson 1985, 2005).

Our goal in this study is to provide some insights into the underpinnings of the observed differences in competitiveness across men and women using a simple experimental task. One approach to lending insights into the source of such preference differences is to find two distinct societies and observe choices that provide direct insights into the competitiveness of the participants. After months of background research, we concluded that the Maasai tribe of Tanzania and the Khasi tribe in India provided interesting natural variation that permitted an exploration into the competitiveness hypothesis. As explained in greater detail below, while several other potentially important factors vary across these societies, the Maasai represent a patriarchal society whereas the Khasi are a matrilineal and matrilocal society.

Our experimental results reveal interesting differences in competitiveness: in the patriarchal society women are less competitive than men, a result consistent with student data drawn from Western cultures. Yet, this result *reverses* in the matrilineal society,

where we find that women are more competitive than men. Perhaps surprisingly, Khasi women are even slightly more competitive than Maasai men, but this difference is not statistically significant at conventional levels under any of our formal statistical tests. We view these results as providing potentially useful insights into the crucial link between culture and behavioral traits that influence economic outcomes.[3] Such insights might also have import within the policy community where targeting of policies can be importantly misguided if the underlying mechanism generating the data is ill-understood.

The remainder of our study proceeds as follows. The next section provides an overview of the two societies and our experimental design. We proceed to a discussion of the experimental results in Section III. Section IV concludes.

II. Societal background and experimental design

> "We are sick of playing the roles of breeding bulls and baby-sitters."
> --A Khasi man (Ahmed, 1994)
>
> "Men treat us like donkeys"
> --A Maasai woman (Hodgson, 2001)

Brief Societal Backgrounds

The Maasai and the Khasi represent, respectively, a patriarchal and a matrilineal/matrilocal society. Originally, we attempted to find two societies in which the roles of men and women were mirror images, but this approach found little success. Indeed, the sociological literature is almost unanimous in the conclusion that truly matriarchal societies no longer exist (Goldberg 1993).[4] In addition, even ordinal classification of societies on any dimension is dangerous, as culture and society are not

[3] As we discuss below, this result might be due to learning or an evolutionary process whereby the selection effects across societies generate natural differences. We argue that in either case culture has an influence.

[4] Campbell (2002) summarizes as follows: "there are societies that are matrilineal and matrilocal and where women are accorded veneration and respect—but there are no societies which violate the universality of patriarchy defined as a 'a system of organization…in which the overwhelming number of upper positions in hierarchies are occupied by males' (Goldberg, 1993, p. 14).".

static fixtures handed down from pre-history. Certain reports of extreme female domination in the Khasi or strong male domination amongst the Maasai are somewhat exaggerated and subject to charges of ethnocentrism.[5]

A. The Khasi

The Khasi of Meghalaya, India are a matrilineal society and inheritance and clan membership always follow the female lineage through the youngest daughter. Family life is organized around the mother's house headed by the grandmother who lives with her unmarried daughters, her youngest daughter (even if she is married), and her youngest daughter's children. Additionally, her unmarried, divorced, or widowed brothers and sons reside in the home. Even in cases when married men reside with their wife's family they spend much, if not most, of their time in the mother's or sisters' household (Van Ham, 2001, Nakane 1967). Women are therefore raised from infancy in their mother's or grandmother's home.

Importantly, the youngest daughter never leaves and eventually becomes the head of the household, whereas older daughters usually form separate households adjacent to their mother's household. Further, women never join the household of their husband's family and some men leave their mother's household to join their wife's household. In some cases, men will practice duolocal marriage (in which they live in both their mother's and wife's households).

Though Khasi women do not generally assume the roles held by men in patriarchal societies (they do not become warriors or hunters, for example) they always live in households in which they or their mother have authority over most household

[5] About the Maasai in particular, there is a vigorous debate on the current and historical role of women (see Hodgson 2000a, 2001 and Spencer 1965, 1994).

decisions. Men, and in particular husbands, on the other hand frequently hold roles that seem to mirror those of women in patriarchal societies. The Khasi husband dwells in a household in which he has no authority or property, is expected to work for the gain of his wife's family, and has no social roles deemed important. His role is summarized by Nakane (1967, p. 125):

> "When we visited the Khasi household of a youngest daughter, if a man (obviously the husband) came first to greet us, he always said 'please wait, my wife (or mother-in-law) is coming.' And it was the wife who entertained us... while her husband remained silent in the corner of the room, or in the next room."

The status of men in Khasi society has even lead to the formation of a men's rights movement (Ahmed, 1994; Van Ham, 2000; Nonbgri, 1988).

Perhaps the most important economic feature of Khasi society is that the return to unverifiable investment in the human capital of girls is retained within the household, whereas in other cultures only the verifiable component of investment can be retained through bride price or dowry. In other words, Khasi families can choose to raise exactly the daughter they would like to keep in their household, not the daughter most likely to be preferred by other households.

B. The Maasai

Age and cattle dominate the Maasai social structure. The most important distinctions between men are age based, and almost all wealth is in cattle. The age structure prevents men from marrying until they are roughly 30 years old and polygamy is the most common form of marriage. Therefore, the average Maasai woman is married to a much older man who typically entertains multiple wives (Spencer, 2003).

The plight of women among the Maasai is such that wives are said to be less important to a man than his cattle. For example, daughters are not counted in response to

the question "how many children do you have?" and a Maasai man will refer to his wife and children as "property." When their husband is absent, most Maasai women are required to seek permission from an elder male before they travel any significant distance, seek health care, or make any other important decision. Although traditionally few Maasai receive any formal education, women receive even less education than men. Their restricted roles and authority combined with the inequality of age in marriage noticeably influence the view that married women have of their roles in society. Of Samburu women (who are part of the larger Maa family of tribes and are very similar to the Maasai), Spencer (1965, p. 231) notes:

> On the whole I found women were quite ignorant of many aspects of the total society and usually unhelpful as informants. Outside the affairs of their own family circle they often showed certain indifference. They were less inquisitive than the males and less quick to grasp situations. They found it harder to comprehend my remarks and questions. I had the impression that they had never been encouraged to show much initiative on their own, and this was a quality which they simply had not developed; any inborn tendencies to this had been baulked by the strictness of their upbringing. Their demeanor was sometimes listless and frequently sour. They often lacked the general conviviality and warmth that typified the adult males and it was only with ameliorating circumstances of middle-age that they tended to acquire it -- and many never did.

Below we provide more thorough descriptions of these two societies in light of the data patterns that we observe in our experiment.

Before moving to the experimental design, however, it is worthwhile drawing some similarities between the two societies. Khasi men enjoy certain powers in their sisters' households, and Maasai women can enjoy prestige and power in their roles as widows (if they have sons).[6] Despite the fact that the Khasi elevate the importance of women, and the historical evidence that they invest significantly in the human capital of

[6] See Hodgson (2000a, 2001) for a more nuanced discussion of the Maasai and Samburu and Lesorogol (2003) for more evidence of the attitudes of the Samburu in an experimental context.

their daughters,[7] many important decisions in Khasi society remain the domain of men. Women do not participate in politics, civil defense, or justice and priesthood is a male profession (Nongbri, 2003). Additionally, there is evidence that women who attempt to speak about such domains are chastised.[8]

Experimental Design

To provide insights into whether there are gender differences in competitive choices across these two societies, we design an experiment that is identical in the two environments (in the parlance of Harrison and List, 2004, our experiment would be deemed an artefactual field experiment). In each session we recruited the participants in advance and asked each potential subject to arrive at a central place in the village (either the school or the clinic) at a given time. This attenuated selection problems since everyone was interested in participating in the experiment after they were made aware of the pecuniary incentives involved. The experiment with the Maasai was conducted in two villages in the Arumeru district in the Arusha region of Tanzania. The experiment with the Khasi was conducted in the Meghalaya region of India. Upon arrival at each experimental site, participants were directed into one of two groups randomly. These groups were separated for the entire experiment.

Similar procedures were used across the societies to ensure comparability. For example, in a representative session amongst the Maasai, the actual experiment was conducted around a small house with four sides, called side 1, 2, 3, and 4. The structure was such that each side of the house was private, and could not be observed from any of

[7] A report from the Agro-economic research centre for North East India (1969) notes the very high levels of school attendance among the Khasi, and particularly the fact that almost all girls were in school at a time when few girls from other tribes ever attended school.

[8] "A woman who dares to voice her opinion on public affairs is regarded as a 'hen that crows'—a freak of nature." (Nongbri, 2003, pp. 187)

the other sides. Subjects in each group were seated on two different sides of the small house: group 1 was seated on side 1 and group 2 was seated on side 2. One by one we privately called participants—one from each group—to the experimental area. Members of group 1 were called to side 3 and members of group 2 were called to side 4. Participants did not know the identities of participants in the other group. On each of those sides was an experimenter awaiting the participants. In a second Maasai session, we were able to use four empty classrooms, similarly isolated from each other. The setup was otherwise identical. The Khasi sessions were run similarly in a classroom setting.

When a participant moved to the area where the experiment was being conducted, he/she met an experimenter who explained the task. Instructions used in the Khasi sessions are reproduced in Appendix A; the Maasai instructions are identical (both sets of original instructions are available at www.arec.umd.edu\kleonard). The instructions were translated from English to the local language (either Maasai or Khasi) and were checked by having a different person translate them back into English. The instructions were read aloud to the individual participant by the experimenter. In each session we had one male and one female experimenter to control for possible gender effects of the experimenter, and we balanced the gender of the participants to have an equal ratio of male and female participants per experimenter.

The experimental task was to toss a tennis ball into a bucket that was placed 3 meters away. They were informed that they had 10 chances. A successful shot meant that the tennis ball entered the bucket and stayed there. The task was chosen because it was simple to explain and implement, and no gender differences in ability were expected (as was found in a pilot experiment and reinforced in the results discussed below).

Further, we are aware of no other popular task in these societies that is similar to the ball games that we implemented. Indeed, the Khasi are known archers and the Maasai are known lancers, but since our task can only be completed with an under-hand toss, the traditional skills do not advantage men over women. In this spirit, our data represent signals of initial competitive inclinations.

Participants, which numbered 155 in total, were told that they were matched with a participant from the other group who was performing the same task at the same time in another area. For example, in the Maasai representative session discussed above, a group 1 member on side 3 was anonymously paired with a group 2 member on side 4, and both subjects were informed that their identities would remain anonymous. The only decision participants were asked to make concerned the manner in which they would be paid for their performance. They made this choice before performing the task, but only after they fully understood the instructions and the payment schemes. The two options participants were asked to choose between were: a) X per successful shot, regardless of the performance of the participant from the other group with whom they were randomly matched, or b) 3X per successful shot if they outperformed the other participant. They were told that in case they chose the second option and scored the same as the other participant they would receive X per successful shot. We set X to equalize payments in terms of the prevailing exchange rates, and to approximate the average one day wage rate for laborers.[9]

After choosing the incentive scheme, participants completed the task and were told how the other participant performed. Then, they were asked to proceed to another location where they provided personal information in an exit survey (see Appendix B for

[9] X was 500 Tanzanian Shillings in Tanzania and 20 Rupees in India.

the experimental survey) and were paid their earnings in cash. As promised, participants were never given the opportunity to learn with whom they were paired.

III. Results

Summary data from the post-experimental survey are presented in Table 1.[10] We present all information drawn from the survey, which includes queries on gender, age, years of education, income, marital status, wage earning activities, and relation to head of household. Our average subject was in the 30-40 age range, but the Maasai sample had slightly older subjects. Average educational attainment is roughly similar across the two groups—about four years of education—but is slightly higher for women (men) among the Khasi (Maasai). Income levels show similar patterns: Khasi women earn more than Khasi men, and the qualitative nature of this result is reversed among the Maasai. Considering purchasing power, the Khasi earn more than the Maasai, though if we delete one extreme Khasi outlier the numbers are similar. Activities across the societies, marital status, and relation to head of household differences are consonant with past anthropological evidence. For example, as suggested above, the Khasi tribe is a monogamous group whereas polygamy is practiced amongst the Maasai. In addition, Khasi women hold more prominent places in their households than Maasai women.

The differences in observable characteristics across gender, both intra- and inter-society, highlights that it is important to control for as many of these factors as possible when examining the data. For example, variables such as income might importantly influence play and relationship to head of household might provide an indication of control over income. Even after this is done, however, there might remain a critical

[10] The Maasai sample does not sum to 75 (34 women and 40 men). This is because one participant failed to complete the survey after the task. This person chose not to compete and had one success.

vector of other variables (whether gambling is condoned, wealth, etc) that might vary between the societies other than the role of women. Clearly, this issue is central to inference made from data gathered across any distinct groups, and highlights that care should be taken when making inference from the data patterns observed herein. Ultimately, what is necessary to shed light on these issues is to build on our work by studying other matrilineal societies.

The top panel in Table 2 provides a summary of competitive choices, balls successfully tossed in the bucket, and earnings across gender and societies. Figure 1 complements these summary data with an ocular depiction of the observed choices. In terms of task proficiency, subjects made roughly 25 percent of their attempts, and the rates of success are similar across societies and genders within each society. More importantly for our purposes, roughly half of the Khasi subjects opted to compete whereas only 39 percent of the Maasai chose to compete. When broken down by gender, the underlying force behind the competitiveness differences across the two societies becomes clear.

In the Maasai data, the gender result that we oftentimes observe in the literature is evident: whereas 50 percent of men choose to compete, only 26 percent of women select to compete. Alternatively, as Figure 1 highlights, Khasi women choose to compete more often than Khasi men—whereas 54 percent of Khasi women choose to compete, only 39 percent of Khasi men select the competitive incentive scheme. Perhaps even more surprisingly, the Khasi women select the competitive environment more often than the Maasai men (54% versus 50%).

Although the raw data summary provides some evidence that behavior varies across the two societies, there has been no attempt to control for observables—such as age, education, and income—that might influence behavior. To rectify this situation, we use the individual observations to estimate a regression model in which we regressed the individual choice to compete on a dummy variable for society, a dummy variable for gender, their interaction, the observables collected from our survey detailed in Table 1, and the gender of the experimenter. Due to the dichotomous nature of the regressand, we present estimates from a probit model.

Empirical results from several specifications are contained in Table 3. The leftmost regression models in Table 3 pool the Khasi and Maasai data, and provide a sense of the data patterns across the two societies. The rightmost columns split the data by society, permitting the controls to have a heterogeneous effect in the two societies. Specification (1) can be considered the parsimonious specification, including only variables that provide the unconditional effect of gender on competition and a control for the gender of the experimenter (male exp. = 1 for male experimenter, 0 for female experimenter). Specification (2) adds the individual level variables to specification (1)—age, education, and income—that might be most expected to influence competitive tendencies. Specification (3) augments specification (2) by including the full set of controls—work activities, marital status, and relationship to head of household.[11]

[11] Given that many of the cells are not well populated for these other controls (see Table 2), we i) made the activity variable binary: farmer/non-farmer, ii) split the marital status variable to also be binary: single/married, where single includes divorced and widowed, and iii) split the relation to head of household variable as binary: either head of household or spouse. In the pooled regression models these distinctions never matter; these changes are necessary to yield parameter estimates for the models with Khasi or Maasai data only (rightmost columns). We also experimented with higher order age terms but they were never significant.

Regardless of which specification is preferred, empirical results suggest that females (males) compete more often than males (females) in the Khasi (Maasai) society. These data patterns are observed in the pooled data models in the leftmost columns, where both the female variable and the Khasi*female interaction are significant at conventional levels. These results suggest, for example, that amongst the Maasai, women are roughly 25-32 percent less likely to compete than men. For the Khasi, women are roughly 15 percent more likely to compete than Khasi men. In the pooled data, all of the other control variables, including the gender of the experimenter, are not significant at conventional levels.

Models that use only Khasi data, presented in the middle columns of Table 3, reveal that the observed gender differences are marginally significant. In specification (1), the differences are not significant at conventional levels, suggesting that unconditionally there is not strong evidence that Khasi females compete more than Khasi males. Yet, in the two models that include controls to condition on observables, the female coefficient of 0.24 is significant at the $p < .07$ level. These estimates suggest that upon properly controlling for observable differences across subjects, Khasi females are 24 percent more likely to compete than Khasi men. In the robustness tests discussed below, we will find that in most of the empirical specifications this result strengthens.

In the rightmost columns, the specifications using the Maasai data show effects of gender that are opposite to the Khasi data—in 2 of 3 models the female coefficient is negative and significant at the $p < .05$ level, with the full-blown model causing the estimate to be measured imprecisely. Amongst the Maasai, men are found to be 24-29

percent more likely to compete than women. In the robustness tests discussed below, the Maasai results become less statistically significant in certain models.

Concerning impacts of the other regressors in the society specific models, in the Khasi data we observe some evidence of an experimenter effect—in this case, both male and female subjects are about 18 percent more likely to compete when the experimenter was a male, an effect that is only marginally significant. In addition, those with higher incomes opted to compete slightly more often, though again the effect is only marginally significant. Interestingly, the only control variable that approaches statistical significance in the Maasai data is the gender of the experimenter. In this case, subjects tend to compete less when the experimenter is a male, and this effect approaches statistical significance in specification 3.[12]

Robustness Tests

A. Group composition

One aspect of the experimental design that we chose to remain neutral was the identity of the subject's potential competitor. This choice was in the spirit of the recent literature that begins with an exploration of the underlying subject preferences and leaves the opponent's gender ambiguous (see, e.g., Gneezy et al., 2003). While in and of itself this choice does not present an inferential problem for our purposes, what is potentially troubling is the fact that our samples are unbalanced across societies: 52 of 80 Khasi subjects are female whereas only 34 of 74 Maasai subjects are female. If subjects deduced the gender distribution of potential competitors, then our preferred interpretation might be compromised. For example, if women are more likely to compete against other

[12] We interacted gender of the experimenter with subject gender and this variable was never significant in either society.

women regardless of whether they are from a matrilineal society, then we might be simply observing a consequence of the subject pool rather than a fundamental preference for competition. Considering the literature on gender and self identity (Cross and Medson (1977)), this is an important consideration.

As aforementioned, in each society we executed the treatments in sessions, whereby the subjects in each session were split into one of two groups randomly. These two groups were separated for the entire experiment. Similar procedures were used across the societies to ensure that subjects were unaware of the identity of potential competitors. Importantly for our purposes, in each society subjects were lined up to participate and were called one by one to participate. Whether, and how, subjects deduced the gender composition of potential competitors is unknown, but it is plausible that subjects made inference on the gender distribution in the experiment by what they observed in their own surroundings.

Since we do not know exactly what subjects observed within their own group, we use a broad array of sensitivity checks to model empirically the effect of group composition. This is possible because we have data on the exact order in which subjects completed the experiment within their session. We proceed by exploring "nearest neighbor" variables and systematically enlarge the set as active control variables in the regression model estimated above (specification 3).

A first empirical augmentation simply includes a variable that depicts the gender of the subject standing immediately in front of the person (where male =1). The next empirical specification uses the arithmetic average of the gender identity of the directly

adjacent subjects.[13] A third model uses the arithmetic average of the gender identity of the four nearest subjects. A fourth model expands this variable to be the average of the gender identity of the eight nearest subjects. A fifth and final model is entirely exhaustive—the arithmetic average of the gender identity of all others in the group.

Table 4 contains summary empirical results from estimation of these models. The columns in Table 4 represent the various specifications of the group composition variable. The three panels of Table 4 present the results for the pooled data, the Khasi data, and the Maasai data, in a manner consonant with Table 3. Although all of the controls of specification 3 are included, we present only the results of interest.

Most importantly, in the pooled data all of the previously discussed empirical results hold across every model, suggesting that we are finding evidence of competitive preference differences across gender, and not merely observing a consequence of the subject pool. When we split the data by society, the results become stronger in certain specifications. For example, in column 1 of the middle panel of Table 4, we find that in the Khasi data women are 36 percent more likely to compete than men, a coefficient that is significant at the $p < .01$ level. Although in this same empirical specification, the Maasai gender result is not close to being significant at conventional levels, it gains marginal significance as the group composition variable becomes more encompassing.

Concerning the effects of the group composition variable, which are only marginally significant, we find a negative correlation in the pooled data. Yet, in the Khasi data we observe a more consistent negative effect that gains statistical significance in some of the specifications, particularly in the models that allow a broader scope of peer

[13] This variable equals one for those subjects who are standing in line between two men, 0.5 for those subjects standing in line between one man and one woman, and 0 for those subjects who are standing in line between two women. Subjects at the front and end of each line have only one adjacent neighbor.

effects. The inference from these models is that as the proportion of males increases in your group, the probability of choosing the competitive option decreases. The effect is also found to be negative in most of the specifications using the Maasai sample, but the t-ratios on these coefficients never reach unity. Overall, if subjects were making inference on potential competitors based on the mix they observed, then the effects reported in Table 4 are consonant with the notion that women are more likely to compete against other women, especially in matrilineal societies.

B. An exploration into who competes

Recall that our design was chosen to explore initial competitive inclinations, rather than observe choices in games that were commonplace. In doing so, we aim to capture insights into the primitive competitive preferences among agents rather than the preferences bundled with stereotypes on task, societal expectations, and the like. In this manner, it is interesting to examine the success rates among those who chose to compete versus those who chose not to compete. Since the experimental game is like no other game or task the agents in either society typically participate, we do not have strong priors on whether those who are more efficient at task will choose to compete.

This is buttressed by the results in the literature that find even in those cases where the subjects have just executed the task and received performance feedback, those who perform well are not significantly more likely to compete, or to perform better if they do choose to compete (Niederle and Vesterlund, 2007; see also Datta et al. 2005). The expected positive relationship between task proficiency and selection into the tournament is further muddled if one considers results in Gneezy et al. (2003), which suggest the competitive environment itself might induce differences in task proficiency.

Together, the literature teaches us that any effort to deduce selection is quite difficult, even in experienced tasks. Our experimental game therefore represents a particularly demanding task in which to find a positive correlation between the competitive choice and success rates.

The raw statistics in the middle and bottom portions of Table 2 paint a picture consonant with the literature—we find no evidence of any significant correlation in task proficiency and the decision to compete. What is interesting in the data is that Khasi women and Maasai men who chose to compete i) earned the highest amount of money in their respective societies and ii) were most likely to win the competition. For instance, the Khasi women won 13 times and lost 10, and their win rate represents the highest of any of the four Khasi groups. Compared to Maasai women, Khasi women are more likely to select correctly, perhaps because Khasi women have a more accurate sense of their relative abilities.[14] Similar data patterns are observed among Maasai men, where those who chose to compete won 11 times and lost 7, a win rate that exceeded all the other observed win rates. Furthermore, again we find that Maasai men seem to have a better understanding of relative ability than Khasi men. Clearly, however, these data patterns should be considered as only suggestive, as more work is necessary to further our understanding of the sources of such differences.

C. Risk Aversion

One aspect of the results in Table 2 and the broader results reported in this study that should be considered more carefully is whether risk aversion is playing an important role in individual choices. We should stress that the manner in which we use the term "competitiveness" in this study is meant to be a catch-all phrase that might be due to

[14] We thank an anonymous referee for urging us to proceed in this direction.

deeper underlying preferences, such as risk aversion. Nevertheless, risk aversion might explain the data patterns observed in Table 2 if those more able also happen to be the most risk averse. In addition, the fact that a large portion of subjects did not choose to compete even though with our payoff function subjects should enter the competition if they believed that they would win with at least 33 percent probability, hints at some level of risk aversion. This possibility is particularly possible in our experiments since they might well be considered to be over large stakes (several days' wages).

To lend insights into these issues, we conducted parallel risk aversion experiments to explore whether the competitive differences might be driven by heterogeneous risk postures across gender groups. To operationalize a simple procedure that measures the propensity to take risks, we made use of a standard risk game (Gneezy and Potters, 1997 and Haigh and List, 2006) and followed the procedures in these studies as closely as possible.[15] Appendix C contains the experimental instructions.

Briefly, the risk experiment has subjects play a one-shot game in which they are endowed with 100 units (40 rupees for the Khasi and 1000 Shillings for the Maasai). The subject must decide what portion of this endowment [0, 100] she desired to bet in a lottery that returned three times the bet with one-half probability and nothing with one-half probability. As illustrated in the experimental instructions contained in Appendix C, subjects were made aware of the probabilities, payoffs, and the fact that the lottery would be played directly after choices were made. Subjects were therefore aware of the fact that they could earn anywhere between 0 and 300 units from this task. Lastly, subjects were informed that monies earned would be paid in private at the end of the experiment.

[15] We also conducted a standard investment game (see, e.g., Fehr and List, 2004); we find no differences in propensities to take invest across gender in either society. These results are available upon request.

A few noteworthy items should be mentioned before proceeding to the results discussion. First, we chose the stakes to overlap with the stakes over which the ball tossing game would be played.[16] Second, experimental subjects for the risk aversion task are again drawn randomly from the two societal populations, but the subject pool has no overlap with the subject pool that played the ball tossing game. This was done to avoid contamination effects while still providing a glimpse of gender differences in risk preferences. Third, beyond using these data to dig deeper into the underlying mechanism at work in this environment, these data might be interesting in their own right considering the recent findings in Henrich and McElreath (2002). They report that there are no systematic differences in the risk preferences of men and women in two traditional societies, including the Sangu, who live just south of the Maasai in Tanzania.

Table 5 presents the summary choices, split by gender across the two societies. In short, we report results consonant with Henrich and McElreath (2002): although the Khasi and Maasai appear to have different risk preferences, there are no gender differences observed in either society.[17] Both male and female Khasi risk approximately 85% of their total endowment, whereas among the Maasai the average bet represents approximately 60% of the total endowment. A two-sample t-test rejects the hypothesis that the gambled amount for Khasi (Maasai) women is different from the gambled amount for Khasi (Maasai) men at the $p = 0.74$ ($p = 0.92$) level.

Discussion

[16] In each group, the initial amount is equivalent to the payment for two successes if the participant chose piece rate and the maximum payoff is equivalent to the payment for two successes if the participant chose competition and won.

[17] We should highlight that in a document titled "Internet Enhancements for 'Are peasants risk-averse decision-makers,'" Henrich expands on the results from Henrich and McElreath (2002) by showing that there are some differences between men and women in a pastoral Sangu village, but not between men and women in an agricultural Sangu village. Among the predominantly pastoral Maasai, we find no such difference.

Our data show that Khasi women are more likely to choose to compete than Khasi men. Furthermore, the Khasi women compete more often than Maasai women or any group of women in the various settings in which preferences for this type of behavior have been elicited. In the very least, these findings represent existence results: it is not universally true that the average female in every society avoids competition more often than the average male in that society because we have discovered at least one setting in which this is not true. To the best of our knowledge, this is the first demonstration of such reversal. In this section, we explore three possible explanations for this result: nature, nurture, and the co-evolution of nature and nurture.

In an extreme sense, one can consider the nature hypothesis to be one whereby women are inherently less competitive than men due to innate differences.[18] Alternatively, the nurture hypothesis is that competitiveness differences are not due to biological or evolutionary reasons, but rather to culture.[19] Gender socialization begins at the moment we are born, with the simple question "is it a boy or a girl?" (Gleitman,

[18] This, of course, does not suggest that all women are less competitive than men, but rather there exists a difference in the distribution of types. A large body of literature in evolutionary biology and socio-biology documents differences in competitiveness between males and females, across a myriad of species. Such differences in competitiveness are said to arise because of differences in the cost of reproduction and the level of investment in offspring. Because the costs associated with raising offspring is higher for females than it is for males, females will increase the fitness of their genes by insuring the survival of fewer children. Males, on the other hand, increase their fitness by competing for access to the most fertile, or fit females. Thus, for women, reproductive success is partially independent of the success of other females, whereas for men, reproductive success comes at the cost of the success of other males. We direct the interested reader to Knight (2002) or Tregenza and Wedell (2002) for recent overviews. The debate is a classic in the field (see Darwin (1871), Bateman (1948) and Trivers (1972)).

[19] An entertaining twist highlighting the power of this argument can be found in the 1988 movie *Twins*, which starred Arnold Schwarzenegger, a physically perfect and innocent man, and his twin, Danny DeVito, a short, overweight small-time crook. Such differences are suggested to have occurred because Schwarzenegger was raised in a pristine environment whereas DeVito spent his childhood on the streets.

Friedlund, and Reisberg, 2000, p. 499). Our societal gender roles are taught to us by, or learned through the imitation of, family, peers, and the media.[20]

The fact that Khasi women have different preferences than other women does not prove that their behavior is not genetically determined. It is possible that some feature of their environment caused the Khasi to follow a different evolutionary path, and therefore to have different psychological profiles from other women. Were this true, matriliny and matrilocal marriage may be outcomes, not causes of female competitiveness. However, the evolution of behavioral characteristics is thought to take place on a scale that would rule out such a process. Evolutionary psychologists maintain that the human mind was formed by one million years of common evolution that ended only 12,000 years ago, and it is therefore impossible that systematic psychological differences across populations of humans can be caused by evolution (Daly and Wilson, 2003, Campbell, 2002).

At the opposite end of the scientific spectrum, there is the view of human behavior as a "tabula rasa" (the mind as a blank slate). In such a view, culture (or the environment) is the only source of preferences. This view of human behavior has suffered a setback over the past few decades as evidence of the genetic origins of abnormal and normal behavior accumulates (Ilies, Avery and Bouchard, 2006). For example, many personality traits have been shown to be highly hereditary in twin studies (Turkheimer, 2004, Loehlin, 1993). Notwithstanding this evidence that many behavioral

[20] Socialization and gender socialization begins at early childhood (Martin, Wood and Little, 1990) and is taught by family and reinforced by culture (Burn, 1996; Basow, 1980; Crespi, 2003), teachers (Eisenberg and Mussen 1989) and peers (Harris, 1998). Nothing in this process requires a view of culture as something forced on children. Indeed, the human species is particularly adept at social learning and many see enculturation as a process of voluntary imitation of successful individuals (Henrich and Gil-White, 2001). The socialization base of gender differences is not limited to young ages. For example, Riley et al. (2004) demonstrate the potential for backlash against assertive female negotiators in a hiring experiment. In their experiment, participants judged female candidates who negotiated for benefits to be less employable than females who did not negotiate, or than males in either condition. This, and related research (Babcock and Laschever, 2003), show that women are treated differently than men when initiating negotiation.

traits are genetically determined, it is possible that preferences for competition are not and therefore that features of the culture or environment determine the degree to which females avoid or seek competition.

Recent literature reminds us that subtle differences in culture can lead to large differences in behavior. Madsen (1967) and Shapira and Madsen (1969) find differences in attitudes about cooperation versus competition between rural and urban children from similar cultures in Mexico and urban and kibbutz children in Israel. Eisenberg and Mussen (1989) suggest that "in poor agricultural communities, children must cooperate in working with other members of their families to raise enough food for the family's survival." There is an extensive literature on the methods by which children learn behavior (Whitings, 1963; Eisenberg and Mussen, 1989 and Harris, 1998). Thus, any number of subtle influences on children or adults can cause differences in attitudes to competition.

Yet, the underlying cultural differences offer room for speculation. Khasi girls are raised in the same household where they spend their whole lives (matrilocal), and as heads of households, they enjoy significant authority over important decisions (matriliny). Thus, the fact that women can be raised exclusively for the benefit of their mothers' and grandmothers' households may mean that innate competitiveness does not need to be discouraged, or competitiveness is encouraged. In addition, if pastoral groups such as the Maasai have different attitudes towards competition than agricultural groups

such as the Khasi, this could help to explain the differences between Maasai men and Khasi men.[21]

Boyd and Richerson (2005) argue that social learning is a more natural form of cultural transmission than explicit training. Individuals may choose to copy successful individuals as much if not more than common individuals, and certainly do not need to be told that they should imitate. Whereas Maasai men are explicitly indoctrinated during the transition to manhood, Khasi women are not indoctrinated, but may choose to imitate the behavior of older women in their households or successful women in their social circles—prestige-based learning. Henrich and Gil-White (2001) suggest that freely conferred deference (prestige) is an adaptation that allows potential imitators proximity to individuals who represent models of successful behavior. This model of social learning highlights the facts that individuals may choose who to imitate, that access and proximity improve the fidelity of social learning, and that those who are imitated gains status from being imitated.

The Khasi institutions of matrilocal residence and matrilineal inheritance may perform a similar role in cultural transmission. The fact that women live in (or next to) their maternal grandmother's residence for their whole lives allows access and proximity (though only to mothers, aunts, great-aunts and grandmothers). In addition, Khasi women are in a position to pass on accumulated wealth, and if competitiveness is differentially rewarded, women who learn competitiveness from their mothers will benefit both from their own efforts and from those of their mothers. In addition, female heads of households, even if they do not gain status by being imitated by their daughters,

[21] Henrich and McElreath (2002) suggest that risk preferences could vary between agricultural and pastoral groups, opening the possibility that competitive preferences may also differ.

have an incentive to encourage success in their daughters. Unlike families in other societies, the household can gain directly from the long-term success of their daughters.

Alternatively, a potential problem with the view that competitiveness can be socially learned is that women have to actually learn to prefer competition (not just to follow career paths that are competitive) because the experimental setting does not allow women to imitate other women. Faced with a new task, Khasi men and women make a choice for themselves, based on their own preferences. Would women who are imitating competitive women choose to be competitive in an experimental setting? Henrich and McElreath (2002) suggest that men and women in Sangu and Mapucha cultures are risk-loving, but that imitation of successful men and women causes them to make choices in their everyday lives that reflect risk-aversion. According to this view, the experimental setting can reveal underlying preferences that are different from real world behavior. If this view of the experimental setting is correct, Khasi women are not imitating the successful strategies of women when they choose competition, they are displaying their true preferences for competition.

Our data—and the possibility that the experimental task reveals true, not learned preferences—are also consistent with a series of models that are intermediate between those of nature and nurture. Such models in which both biology and society play a role in forming preferences, and allow for the impact of current societal features to be less important than the impact of past societal features. Those Khasi institutions that favor the transmission of a behavior through social learning also favor the transmission of genetically inherited characteristics, such as innate competitiveness. Many scholars suggest that the view of the human mind as un-differentiated across cultures fails to take

into account the possibility that culture and genetics can interact. The study of gene-culture co-evolution in mathematical modeling suggests that when a particular genetic characteristic favors the transmission of a particular cultural feature, and the cultural feature also increases the fecundity of the genetic characteristic, evolution can occur at a much faster pace (Cavalli-Sforza and Feldman 1981; Boyd and Richerson 1985, 2005; Feldman and Cavalli-Sforza 1976; Laland and Brown, 2002; Mesoudi and Laland 2007).

The possibility of gene-culture co-evolution leads us to focus primarily on the institutions of matrilocal residence and matrilineal inheritance. First, as we have noted above, matrilocal residence creates a particular relationship between mothers, grandmothers, and daughters that benefits all three women. Second, matrilineal inheritance can reinforce any genetic tendency to competition by passing on both wealth and genetic disposition to daughters. In an environment of high childhood mortality, wealth can greatly increase the probability of survival.[22] In addition, there is evidence that genetic inheritance is different in cultures that practice matrilocal marriage. Oota et al. (2001) find significant variation in Y-chromosome features but less variation in maternal DNA for matrilocal tribes in Thailand, and the opposite for patrilocal groups in the same location. In other words, the cultural choice to displace men or women from their maternal homes, by itself, alters the process of genetic inheritance.

However, the very process that would favor genes linked to competitiveness (if they exist), would also favor competitiveness learned from the imitation of successful women. A model in which competitiveness improves the "evolutionary fitness" of the

[22] Indian Census data from 1891-1911 suggests that only 50% of girls survived to the age of 15 (Mari Bhat, 1989). In addition, Pritchett and Summers (1996) estimate the short-term elasticity of child mortality with respect to income at about -0.2.

institutions of matriliny and matrilocal marriage, and the institutions of matriliny and matrilocal marriage increase the "evolutionary fitness" of competitiveness, does not require biological evolution of DNA. Girls who imitate the behavior of successful competitive women are more likely to survive childhood and will inherit greater wealth if those women are also their mothers or grandmothers. In turn, their wealth and success make them more preferable as a model for younger girls (likely their daughters and nieces) and more likely to have surviving children.

This process is subtly different from that outlined under the nurture hypothesis. If competitiveness has evolved (biologically or socially) over time, it is not necessary that matriliny and matrilocal marriage cause families to teach their daughters to be competitive. Rather, the prevalence of competitiveness in the society could increase over time due to the superior fitness of this personality trait within this institutional environment, whether it is learned through imitation or inherited genetically. In addition, this view suggests that current cultural features might be less important than past cultural features in explaining current preferences; evolution of socially learned behavior is not instantaneous.

V. Concluding Remarks

The link between gender and competition has been shown in several recent experimental studies. The importance of these results should not be understated: in both a positive and normative sense these insights have the potential to explain important puzzles in economics and in social science more generally. In this study we use a real experimental task to explore whether there are gender differences in selecting into competitive environments across two distinct societies: the Maasai in Tanzania and the

Khasi in India. The societies are unique in that the Maasai represent an example of a patriarchal society whereas the Khasi are matrilineal.

We observe some interesting data patterns. For example, Maasai men compete at roughly twice the rate as Maasai women, evidence that is consistent with data from Western societies that use different tasks and smaller relative stake levels. Yet, this data pattern is reversed amongst the Khasi, where women choose the competitive environment more often than Khasi men. We interpret these results as potentially providing insights into the underlying sources of the observed gender differences. We should, however, caution the reader that even though we find suggestive results, care should be taken when making inference from the data patterns observed herein because several important factors vary across the two societies. More research is certainly warranted.

Viewed through the lens of extant models, our results might have import within the policy community. For example, policymakers often are searching for efficient means to reduce the gender gap. If the difference in reaction to competition is based primarily on nature, then some might advocate, for example, reducing the competitiveness of the education system and labor markets in order to provide women with more chances to succeed. If the difference is based on nurture, or an interaction between nature and nurture, on the other hand, the public policy might be targeting the socialization and education at early ages as well as later in life to eliminate this asymmetric treatment of men and women with respect to competitiveness. Our study suggests that there might be some value in this second avenue. We trust that future research will refine this insight and more thoroughly explore the sources of gender preference differences.

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Appendix A. Experimental Protocol (Khasi sessions)

Welcome to this study of decision-making. The experiment will take about 15 minutes. The instructions are simple, and if you follow them carefully, you can earn a considerable amount of money. All the money you earn is yours to keep, and will be paid to you, in cash, immediately after the experiment ends. In addition to any earnings you might have in this task, you will be paid 20 rupees to participate.

The task that we ask you to perform today is throwing this ball into this bucket from this line. *(Show them the ball, bucket and line)*. You will have 10 tries.

We now ask you to choose one of two options according to which you will be paid in the experiment.

Option 1:
If you choose this option you will get 20 Rupees for each time you get the ball in the bucket in your 10 tries. So if you succeed 1 time, then you will get 20 Rupees. If you succeed 2 times, then you will get 40 Rupees. If you succeed three times you will get 60 Rupees and so on.
Option 2:
If you choose this option you will receive a reward only if you succeed more times than the person who is playing in the next room. If you succeed more than this person you will be paid 60 Rupees for every time you succeed. So if you succeed 1 time, then you will get 60 Rupees. If you succeed 2 times, then you will get 120 Rupees. If you succeed 3 times you will get 180 Rupees and so on. But you will only receive a reward if you are better than the person in the next room. If you both succeed the same number of times you will both get 20 Rupees for each success.

We now ask you to choose how you want to be paid: according to option 1 or option 2. Now you may play. Record both their ID number and their choice.

Allow the participant to toss the balls and record the result on the back of their ID card. You can record the result of each toss with a checkmark and X (check mark for success and X for failure). At then end of the 10 tosses, write the total number of successes on the back of the card and the money value of each toss (based on their choice). Also write down whether they succeeded more than their opponent with and Y or N.

For example, √√X√XX√√√√ 7 X 20 Y

You do not need to write the total payment on the card. Tell them that they must go to the person who will fill an exit survey. Once they have filled this survey they should take their card and the survey to the "cashier" and they will receive their payment.

IF THEY ASK YOU WHAT TO DO:
Tell them that you cannot give them advice about what to choose and offer to read the script to them again.

Appendix B: Individual Characteristics Survey (Used with Khasi and Maasai)

Page 1 ID number

Household Demographic Composition

Interviewer | Date

Name of the Head of Household

Relationship to Head of Household (*circle one)*

HH	head of household	SP	spouse	SD	Son/daughter
FM	father/mother	BS	brother/sister	DS	servant
FS	foster child	OR	other relation	NR	no relation

Age

Gender *(circle one)*

M male F female

Marital Status *(circle one)*

SG	single	MM	married monogomous	PM	married polygomous
WI	widow (er)	DI	divorced	OT	other

Years of Education

Activities

Activity	Days per Week	Wage Earned		tick one d	w	m	y

Appendix C. Experimental Instructions for Risk Aversion Game (Khasi Sessions)

Welcome to this study of decision-making. The experiment will take about 15 minutes. The instructions are simple, and if you follow them carefully, you can earn a considerable amount of money. All the money you earn is yours to keep, and will be paid to you, in cash, immediately after the experiment ends. In addition to any earnings you might have in this task, you will be paid 20 rupees to participate.

At the beginning of this experiment you will receive 40 rupees. You are asked to choose the portion of this amount (between 0 and 40) that you wish to invest in a risky option. The rest of the money will be accumulated in your total balance.

The risky investment: there is an equal chance that the investment will fail or succeed. If the investment fails, you lose the amount you invested. If the investment succeeds, you receive 3 times the amount invested.

How do we determine if you win? After you have chosen how much you wish to invest, you will toss a coin to determine whether you win or lose. If the coin will come up head, you win three times the amount you chose to invest. If it will come up tail, you lose the amount invested.

Examples:

1. If you choose to invest nothing, you will get the 40 rupees for sure. That is, the coin flip would not affect your profits.
2. If you choose to invest all the 40 rupees, then: if the coin comes up head, you win 120 rupees and if the coin comes up tail you win nothing and end up with 0.
3. If you choose to invest 20, then: if the coin comes up head, you win 80 (20+3*20). If the coin lends on tail, you win 20.

Do you have any questions?

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Ask them how much they would like to invest.

Table 1 Participant Characteristics

	Khasi			Maasai		
		Mean (Std. dev.)			Mean (Std. dev.)	
	Pooled	Women	Men	Pooled	Women	Men
Individual Characteristics						
Age	30.9 (16.1)	32.1 (16.7)	28.8 (15.0)	37.8 (13.5)	36.5 (12.1)	38.9 (14.6)
Education	4.3 (3.6)	4.5 (3.6)	4.1 (3.5)	4.3 (3.9)	4.1 (4.4)	4.5 (3.5)
Income	23569 (76088)	25794 (93429)	19437 (20585)	195040 (400538)	154294 (341903)	234550 (448855)
Activity						
Farmer	0.60 (0.5)	0.60 (0.5)	0.61 (0.5)	0.73 (0.5)	0.53 (0.5)	0.93(0.3)
Student	0.23 (0.4)	0.21 (0.1)	0.25 (0.4)	0.00 (0.0)	0.00 (0.0)	0.00(0.0)
Teacher	0.05 (0.2)	0.06 (0.2)	0.04 (0.2)	0.00 (0.0)	0.00 (0.0)	0.00(0.0)
Housewife	0.01 (0.1)	0.00 (0.0)	0.04 (0.2)	0.17 (0.4)	0.38 (0.5)	0.00(0.0)
Other	0.05 (0.2)	0.06 (0.2)	0.04 (0.2)	0.07 (0.3)	0.06 (0.2)	0.08(0.3)
Unemployed	0.06 (0.2)	0.08 (0.3)	0.04 (0.2)	0.00 (0.0)	0.00 (0.0)	0.00(0.0)
Marital Status						
Single	0.36 (0.5)	0.33 (0.5)	0.43 (0.5)	0.24 (0.4)	0.18 (0.4)	0.30 (0.5)
Marr. (mono.)	0.44 (0.5)	0.42 (0.5)	0.46 (0.5)	0.32 (0.5)	0.38 (0.5)	0.28 (0.5)
Marr. (poly.)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.36 (0.5)	0.35 (0.5)	0.38 (0.5)
Widowed	0.13 (0.3)	0.17 (0.4)	0.04 (0.2)	0.01 (0.1)	0.03 (0.2)	0.00 (0.0)
Divorced	0.08 (0.3)	0.08 (0.3)	0.07 (0.3)	0.04 (0.2)	0.03 (0.2)	0.05 (0.2)
Relation to Head of Household						
HH	0.38 (0.5)	0.39 (0.5)	0.36 (0.5)	0.53 (0.5)	0.18 (0.4)	0.85 (0.4)
Spouse	0.23 (0.4)	0.29 (0.5)	0.11 (0.3)	0.32 (0.5)	0.71 (0.5)	0.00 (0.0)
Son/Daughter	0.36 (0.5)	0.31 (0.5)	0.46 (0.5)	0.09 (0.3)	0.03 (0.2)	0.15 (0.4)
Brother/Sister	0.04 (0.2)	0.02 (0.1)	0.07 (0.3)	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)
Father/Mother	0.00 (0.0)	0.00 (0.0)	0.00 (0.0)	0.03 (0.2)	0.06 (0.2)	0.00 (0.0)
N	80	52	28	75	34	40

Age denotes chronological age in years.
Education denotes years of education.
Income denotes reported yearly income (Khasi in Rupees and Maasai in Tanzanian Shillings)
Marital Status denotes whether the individual is single, married (monogamous), married (polygamous), widowed, or divorced.
Activity denotes the wage earning activities that subjects report.
Relation to Head of Household denotes whether the individual is the household head (HH), spouse, son/daughter, brother/sister, or father/mother of the HH.
The Maasai women and men observations do not sum to the total observations because we failed to obtain the gender of one participant.

Table 2 Participant Choices

	Khasi			Maasai		
		Mean (Std. dev.)			Mean (Std. dev.)	
	Pooled	Women	Men	Pooled	Women	Men
Experiment Summary						
Compete	0.49	0.54	0.39	0.39	0.26	0.50
	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
Success	2.38	2.38	2.36	2.78	2.97	2.63
	(1.5)	(1.6)	(1.4)	(1.6)	(1.7)	(1.5)
Earnings (X)	3.46	3.73	2.96	4.02	3.68	4.33
	(3.9)	(4.2)	(3.3)	(4.3)	(4.0)	(4.5)
N	80	52	28	74	34	40
Those who chose to compete						
Success	2.23	2.25	2.18	2.69	2.33	2.85
	(1.5)	(1.5)	(1.5)	(1.6)	(2.2)	(1.3)
Won-loss-tie	16-14-9	13-10-5	3-4-4	14-13-2	3-6-0	11-7-2
Earnings (X)	4.46	4.75	3.72	5.86	5.00	6.25
	(5.2)	(5.3)	(5.0)	(6.2)	(7.7)	(5.6)
Those who chose not to compete						
Success	2.51	2.54	2.47	2.84	3.20	2.40
	(1.5)	(1.6)	(1.4)	(1.6)	(1.4)	(1.7)
Won-loss-tie	18-20-3	11-11-2	7-9-1	19-18-8	9-9-7	10-9-1
Earnings if choice reversed (X)	4.95 (5.9)	5.42 (6.2)	4.29 (4.3)	5.42 (6.2)	5.60 (6.2)	5.20 (6.3)

Compete denotes whether the individual opted to compete in the experiment.
Success denotes the number of successful attempts in the experiment (out of 10 balls tossed).
Earnings denotes the units earned during the experiment, where the units = successes if the agent chose not to compete, = 3*successes if the agent chose to compete and won, = successes if the agent chose to compete and tied, and = 0 if the agent chose to compete and lost.
Earnings if choice reversed denotes the units foregone because the agent chose not to compete.

Table 3 Regression Results

	Pooled Data			Khasi			Maasai		
	(1)	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**	**(1)**	**(2)**	**(3)**
Female	-0.25	-0.29	-0.32	0.15	0.24	0.24	-0.24	-0.29	-0.27
	(0.12)	(0.13)	(0.15)	(0.11)	(0.13)	(0.13)	(0.12)	(0.12)	(0.18)
Khasi	-0.11	-0.14	-0.15	---	---	---	---	---	---
	(0.12)	(0.13)	(0.14)						
Khasi*Female	0.39	0.43	0.46	---	---	---	---	---	---
	(0.17)	(0.17)	(0.19)						
Male Exp.	0.007	-0.02	-0.03	0.08	0.19	0.18	-0.07	-0.16	-0.21
	(0.08)	(0.08)	(0.08)	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)	(0.13)
Constant	-0.003	-0.03	-0.09	-0.14	-0.36	-0.34	0.03	0.14	-0.03
	(0.09)	(0.17)	(0.20)	(0.11)	(0.20)	(0.27)	(0.09)	(0.26)	(0.31)
Age	---	0.002	0.002	---	-0.003	-0.002	---	0.001	0.002
		((0.003)	(0.003)		(0.004)	(0.005)		(0.005)	(0.005)
Education	---	0.005	0.009	---	0.003	0.003	---	-0.006	-0.004
		(0.01)	(0.01)		(0.02)	(0.02)		(0.02)	(0.02)
Income	---	-0.2e-6	-0.2e-6	---	0.1e-4	0.1e-4	---	-0.3e-6	-0.3e-6
		(0.2e-6)	(0.2e-6)		(0.4e-5)	(0.4e-5)		(0.2e-6)	(0.2e-6)
Other Controls	NO	NO	YES	NO	NO	YES	NO	NO	YES
Chi-square	7.3(4)	9.8(7)	12.6(10)	2.0(2)	11.4(5)	11.9(8)	4.7(2)	9.3(5)	12.9(8)
N	154	151	151	80	80	80	74	71	71

Notes:
1. Dependent variable is "compete" and takes on a value of 1 if the participant opted to compete, and 0 otherwise.
2. Standard errors are in parentheses.
3. Estimates are partial derivatives computed at the sample means from Probit models.
4. Variables defined in Table 1 notes. "Male exp." equals one if the experimenter was male, 0 otherwise. "Other controls" include all of the other variables defined in Table 2.

Table 4 Group Composition Robustness Tests

	Specification				
	(In Front)	**(Adjacent 2)**	**(Adjacent 4)**	**(Adjacent 8)**	**(Group)**
Pooled Data					
Female	-0.38	-0.42	-0.41	-0.43	-0.38
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
Khasi	-0.25	-0.28	-0.25	-0.28	-0.23
	(0.16)	(0.16)	(0.15)	(0.16)	(0.16)
Khasi*Female	0.60	0.65	0.56	0.58	0.53
	(0.22)	(0.23)	(0.20)	(0.20)	(0.20)
Group	-0.16	-0.19	-0.28	-0.35	-0.23
Composition	(0.10)	(0.12)	(0.17)	(0.21)	(0.25)
Other Controls	YES	YES	YES	YES	YES
N	141	151	151	151	151
Chi-square	13.8(11)	15.2(11)	15.4(11)	15.5(11)	13.5(11)
Khasi Data					
Female	0.36	0.34	0.24	0.25	---
	(0.15)	(0.15)	(0.14)	(0.14)	
Group	-0.28	-0.25	-0.68	-0.95	---
Composition	(0.15)	(0.18)	(0.36)	(0.51)	
Other Controls	YES	YES	YES	YES	---
N	78	80	80	80	---
Chi-square	16.1(9)	13.9(9)	15.6(9)	15.6(9)	---
Maasai Data					
Female	-0.25	-0.27	-0.27	-0.31	-0.34
	(0.20)	(0.20)	(0.19)	(0.20)	(0.20)
Group	0.09	-0.008	-0.007	-0.12	-0.20
Composition	(0.15)	(0.17)	(0.21)	(0.25)	(0.27)
Other Controls	YES	YES	YES	YES	YES
N	63	71	71	71	71
Chi-square	14.2(9)	12.9(9)	12.9(9)	13.2(9)	13.5(9)

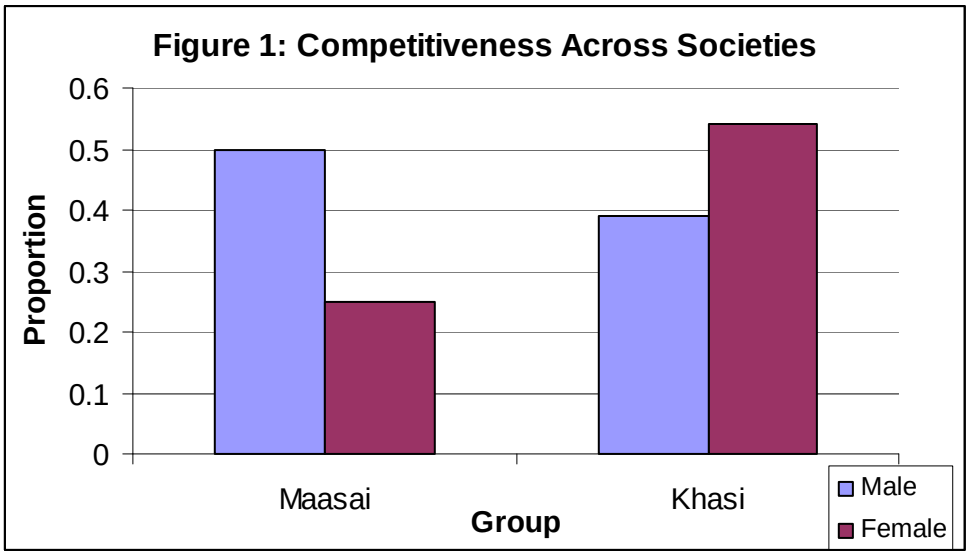
Notes:

1. Dependent variable is "compete" and takes on a value of 1 if the participant opted to compete, and 0 otherwise. Each column represents a unique model that uses a different group composition regressors. "In Front" is a variable that depicts the gender of the subject standing immediately in front of the person (where male =1). "Adjacent n" uses the arithmetic average of the gender identity of the directly adjacent n subjects. "Group" is entirely exhaustive—the arithmetic average of the gender identity of all others in the group—this model is not estimable using the Khasi data alone because each group had an identical composition.
2. Standard errors are in parentheses.
3. Estimates are partial derivatives computed at the sample means from Probit models.
4. Variables defined in Table 1 notes. "Other controls" include all of the other variables defined in Table

Table 5. Raw Data Summary for Risk Aversion Game

	Average Bet (Standard deviation)			
	Khasi Women	*Khasi Men*	*Maasai Women*	*Maasai Men*
Proportion Bet	86.5 (3.3)	85.0 (4.0)	60.7 (4.1)	61.3 (4.2)

Amount in the cell is average (standard deviation) amount bet of 100. A two-sample t-test (assuming equal variances) rejects the hypothesis that the bets for Khasi women are different from the bets for Khasi men (p-value 0.74) and rejects the hypothesis that the bets for Maasai women are different from the bets for Maasai men (p-value 0.92).



Note: Figure depicts a summary of competitive choices across gender in the two societies.