

# Gender Differences in Competition: The Role of Socialization

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## **Abstract**

This study uses an 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. One unique aspect of these civilizations is that the Maasai represent a textbook example of a patriarchal society whereas the Khasi are matrilineal. Similar to the extant evidence drawn from experimental data 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 considerably more often than Khasi men, and even choose to compete weakly more often than Maasai men. These results provide initial insights into the underpinnings of the factors hypothesized to be important determinants of the observed gender differences. In particular, the data provide a first piece of evidence that the existing societal structure is crucially linked to the observed gender differences in competitiveness.

Key words: Gender and competition, nature versus nurture, field experiment

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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 less inclined to make career sacrifices.<sup>1</sup> 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)), an alternative explanation arises: men are more competitively inclined than women.<sup>2</sup> 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 much more often than women, even in tasks where women are more able. Such findings provide insights into why we might 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 hypothesis that has been put forth many times is that men and women are born 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

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<sup>1</sup> For example, Altonji and Blank (1999); Blau and Kahn (1992; 2000); Blau, Ferber and Winkler (2002).

<sup>2</sup> See also Vandegrift, Yavas, and Brown (2004); Niederle and Vesterlund (2005); Gneezy and Rustichini (2005); and Datta, Poulsen and Villevall (2005).

heterogeneity exists in the competitiveness of individuals raised in quite similar environments.

Nevertheless, the role of nurture, or the fact that socialization might be critically linked to competitive inclinations, is also an important hypothesis. More than a handful of our male readership can likely recall vividly their physical education teacher scolding them with the proverbially “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 (see, e.g., Ridley 2003, Turkheimer 1998, 2003).

For our purposes, therefore, the “nature” hypothesis is that women are inherently less competitive than men due to innate differences.<sup>3</sup> Alternatively, the nurture hypothesis is that competitiveness differences are not due to biological or evolutionary reasons, but rather to the socialization process.<sup>4</sup> Gender socialization begins at the moment we are born, with the simple question “is it a boy or a girl?” (Gleitman, Friedlund, and Reisberg, 2000, p. 499). Our societal gender roles are taught to us by family, peers, and the media. Indeed, even at early childhood there are large differences between how boys and girls interact that are attributed to socialization (Martin, Wood and

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<sup>3</sup> 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 arise because of differences in the cost of reproduction and the level of investment in offspring. Because the cost associated with raising offspring is higher for females than it is for males, competitive males attempt to mate at every opportunity. Females, on the other hand, are inherently choosy, reserving their favors for the strongest suitor. In other words, competitiveness is more important to the reproductive success of males than of females. As a result males have evolved to be more competitive. 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).

<sup>4</sup> 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.

Little, 1990). According to the socialization explanation, it is life experiences that reinforce or contradict gender differences: females are taught appropriate behaviors for their gender (Burn, 1996; Basow, 1980; Crespi, 2003).<sup>5</sup>

Our goal in this study is to provide initial insights into the underpinnings of the observed differences in competitiveness across men and women using a simple, but real experimental task. A useful starting point is a hypothesis wherein behavioral differences are purely driven by innate differences, and societal structure and its accompanying influences have little link to choices of competitiveness. Using this notion as a working hypothesis, the empiricist's job 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, the Maasai represent a textbook example of a patriarchal society whereas the Khasi are matrilineal.

We find considerable differences in competitiveness: in the patriarchal society women are significantly less competitive than men, a result consistent with Western cultures. Yet, this result *reverses* in the matrilineal society, where we find that women are more competitive than men. Surprisingly, Khasi women are even slightly more competitive than Maasai men, but this difference is not statistically significant at conventional levels. We view these results as providing initial insights into the crucial

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<sup>5</sup> The socialization base of gender differences is not limited to young ages. It could also be differential treatments in later ages, or even in the work place itself. For example, Riley, Bowless, Babcock, and Lai (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 Lascheve, 2003), show that women are treated differently than men when initiating negotiation.

link between socialization and behavioral traits that influence economic outcomes.<sup>6</sup> Such insights have import within the policy community where targeting of policies can be importantly misguided if the underlying structure at work 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 provides a discussion of nature and nurture and potential modeling approaches that provide insights into the empirical results. Section V 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)

### **A. Brief Societal Backgrounds**

The Maasai and the Khasi represent, respectively, a patriarchal and a matrilineal 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, and there is some controversy over whether or not such societies ever existed (Sanday, 2002).<sup>7</sup> In addition, even ordinal classification of societies on any dimension is dangerous, as culture and society are not a static fixture handed down from

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<sup>6</sup> 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 important influence.

<sup>7</sup> Certain authors claim that reports of matriarchy from the 19<sup>th</sup> century are based on the misunderstandings of social norms that arise when anthropologists or explorers have tried to describe a society using language and constructs designed to describe western societies (Sanday, 2002; Hua, 2001; Hodgson 2000a;b;c; 2001).

prehistory. Most reports of female domination in the Khasi or male domination in Maasai are exaggerated and subject to charges of ethnocentrism.<sup>8</sup>

### **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 also 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).

Thus, women are raised from infancy in their mother's or grandmother's house. The youngest daughter never leaves and eventually becomes the head of the household. Older daughters usually form separate households adjacent to their mother's household. Women never join the household of their husband's family and some men will 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 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

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<sup>8</sup> 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).

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 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.

### **The Maasai**

Age and cattle dominate the Maasai social structure. The most important distinctions between men are age based, and as a pastoralist society 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 affect the view that married women have of their role 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 balked 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.

## **B. Experimental Design**

The experiment was conducted in similar environments within both societies. In each session we recruited the participants in advance and asked each potential subject to show up 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 Arumeru district in Arusha region of Tanzania. The experiment with the Khasi was conducted in the Shillong 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 one session amongst the Maasai, the 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 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 there was an experimenter who waited for 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 the Appendix; the Maasai instructions are identical. 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 number of male and female participants per experimenter.

The task participants were given was to toss a tennis ball 10 times into a bucket that was set 3 meters from them. 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).

Participants, which numbered 156 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 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. 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 choose the second option and scored the same as the other participant they would receive X per successful shot. Across both societies we set X equal to the average one day wage rate (roughly \$0.50).<sup>9</sup>

After choosing the incentive scheme, participants completed the task and were told how the other participant performed. Then they were asked to go to another location in which they completed an exit 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 is presented in Table 1. In the Table, besides individual choices and success rates, we include information drawn from the post-experimental survey,

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<sup>9</sup> X was 500 Tanzanian Shillings in Tanzania, and 20 Rupees in India.

which included queries on gender, age, years of education, and marital status of the experimental participants. Concerning the individual-specific variables, we find that our average subject was in the 30-40 age range, but the Maasai sample had slightly older subjects (38.3 versus 30.9). Average educational attainment is roughly similar across the two groups—about four years of education—but marital status differs. As suggested above, and is borne out in the data, the Khasi tribe is a monogamous group whereas polygamy is practiced amongst the Maasai.

Panel B in Table 1 provides a summary of choices and success rates across gender and societies. In terms of success rates, 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 38 percent of the Maasai chose to compete. When broken down by gender, the reason for the observed differences in competitiveness across the two societies becomes clear. Figure 1 complements these summary data.

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 25 percent of women select to compete. This difference, which is similar in levels to data drawn from Western cultures, is statistically significant at the  $p < .05$  level using a parametric test of proportions.

Alternatively, as Figure 1 highlights, Khasi women choose to compete much 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. This difference is supported at the  $p < .05$  level using a test of proportions. Perhaps even more surprisingly,

the Khasi women select the competitive environment more often than the Maasai men (54% versus 50%), but this difference is not significant at conventional levels.

Although analysis of the raw data provides initial evidence that culture is critically linked to individual decisions of whether to compete, there has been no attempt to control for observables—such as age, education, and marital status—that might influence behavior. To provide a robustness test of the insights gained from Table 1 and Figure 1, we use the 156 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, and observables collected from our survey. Due to the dichotomous nature of the regressand, we include estimates from both an ordinary least squares model and a probit model.

Empirical results from two specifications are contained in Table 2. Model I can be considered the parsimonious specification, whereas Model II includes the full set of controls. Regardless of which specification is preferred, empirical results are quite strong and suggest that females (males) compete much more often than males (females) in the Khasi (Maasai) tribe. For example, amongst the Maasai, women are roughly 27 percent less likely to compete than men, and this result is statistically significant at the  $p < .05$  level. For the Khasi, women are roughly 15 percent more likely to compete than Khasi men, a difference that is statistically significant at conventional levels.<sup>10</sup>

We interpret these results as suggestive of the power that socialization can play in affecting individual competitiveness. While this result certainly does not solve the nature

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<sup>10</sup> Since these experiments might well be considered over large stakes, we also ran parallel risk aversion experiments to explore whether these differences are driven by heterogeneous risk postures across gender groups. Using both a standard risk game (see, e.g., Gneezy and Potters (1997), Haigh and List, 2006) and an investment game (see, e.g., Fehr and List, 2004), we find no differences in propensities to take risks across gender in either society in either game. These results are available upon request.

versus nurture debate concerning this issue, it does lend preliminary insights into the underpinnings of the factors hypothesized to be important determinants of the observed gender differences. In particular, the data provide a first piece of evidence that the existing societal structure is crucially linked to the observed gender differences in competitiveness. Further, it is suggestive that innate differences might not be the most important factor influencing competitive inclinations.

The differences that we observe across societies is similar to classic discussions of stigmatization (Allport, 1954) that conceptualize the experience of being stigmatized as involving some internalization of the stigmatizing images and stereotypes of one's group. This internalization, in turn, can alter and even damage the individual personality. Stigmatized individuals have various mechanisms to protect their self-esteem. Specifically they tend to psychologically disengage and dis-identify from domains in which they are threatened by stereotypes, i.e. expecting and experiencing poor performance and failure. Relevant here, if the social stigma is that women are inferior in competitive climates, is that women will then avoid competitive situations. Such dis-identification from domains in which one's group is disadvantaged or threatened by negative stereotypes has the potential to lead to systematic group differences in aspirations, skills, and achievement, even when individual capabilities do not warrant these differences (Crocker and Major, 1989).

Moreover, a recent and rapidly growing strand of literature put forward by Steele (1997) and Steele and Aronson (1995) suggests that stigmatized individuals are harmed by prejudices. They are vulnerable to what Steele denotes as "stereotype threat:" the threat that arises when one is in a situation of doing something for which a negative

stereotype about one's group applies. It is the threat that a negative stereotype about a group to which one belongs becomes self-relevant, usually as a plausible interpretation for something one is doing, for an experience one is having, or for a situation one is in, that has relevance to one's self-definition. The stereotype threat simply presents an additional degree of self-threat, one that is not borne by people not stereotyped this way.

#### **IV. On Nature versus and Nurture**

While we have outlined the various learning mechanisms that might cause the data patterns observed herein, we do not view these results as suggesting that nature plays no role. Although we are unaware of any studies in humans of heritability of competitiveness, other similar personality traits have been shown to be highly hereditary, for example in twin studies (Turkheimer, 2004, Loehlin, 1993).

Thus, a proposal that competitiveness is hereditary is not extreme. However, ceding that a personality characteristic has high heritability is not isomorphic to claiming that the environment, or nurture, does not play an important and even potentially dominant role. Twin studies take place within highly homogenous populations and usually within a context of relative wealth. Ridley (2003) and Turkheimer (1998) point out that homogeneity in nurture accentuates the role of nature and standard undergraduate genetics textbooks caution that:

[t]he fact that heritability is high in each population tells us nothing about the cause of differences between the population, because the populations were reared in different environments (Freeman and Heron , 2004).

Turkheimer et al. (2003) make this caveat explicit by showing that the proportion of IQ variance in twins attributable to nature is 60% in children well above the poverty level,

but close to zero for children below the poverty level. The key point is that environmental factors can overwhelm genetic factors.

Our work suggests that environment may have just such an effect on competitiveness. Comparing men and women may be dangerous precisely because they do not face similar environments and therefore the expression of their genetically determined personality may be constrained differently. The distribution of the genetic characteristics that lead to competitiveness in women may be no different among the Khasi than the Maasai or indeed any society, but it is the Khasi women who have been exposed to an environment that allows them to reach their genetic potential, just as the children of affluent families can reach their genetic IQ potential.

Our results are also compatible with an evolutionary model of competitiveness in which the present environment plays no role in the desire of women to compete. To see this, imagine that there is a variant of a gene that, when combined with female hormones (or not combined with male hormones) suppresses the expression of competitiveness, and that, for various reasons, in the early history of humanity, this gene thrived alongside variants of the gene that led women to want to compete.

At some point in history, the Khasi society differentiated itself from other societies and changed the role of women. Even if matriliney and patriarchy both allow for the full expression of competitiveness in women, matriarchy may create an environment in which the fecundity of the variant of the gene that encourages competitiveness is greater than that of other variants. Given enough time, we would find that women genetically descended from historically matrilineal societies are more likely to compete than other women, independent of the environment in which they were reared: they are

genetically, not environmentally, engineered to compete. In such a case, culture is important in the fecundity of genes, but not in the upbringing of children.

In the environment of a poor pre-antibiotic and pre-germ theory of disease society, it is not hard to imagine evolutionary forces that could give advantages to particular variants of genes. Indian Census data from 1891-1911 suggests that only 50% of girls survived to the age of 15 (Mari Bhat, 1989). The Khasi form of matriliney allowed women greater freedom to choose their economic pursuits, greater control over the use of funds within the household, and the right to pass on accumulated wealth and status to their daughters. If competitive women enjoy a greater degree of economic success than non-competitive women, then, by directing money towards the care of their children and passing on wealth to their daughters, they might have been able to ensure a greater survival rate for children who carry the competitive version of a particular personality gene. These two views of competitiveness provide us with two alternative hypotheses, and the more attractive option that both are partly predictive. On the one hand, Khasi society may remove social barriers that prevent naturally competitive women from expressing their true personality. Alternatively, Khasi society may allow competitive women to earn greater rewards to their effort and to pass on accumulated wealth to their daughters, both of which will increase the fecundity of their competitive genes. The former alternative suggests that, though modern society has made great strides in liberating women, there remain important barriers. The latter alternative appears to suggest that, although the modern liberation of women has not seen an increase in the competitiveness, it has set in place an evolutionary mechanism that may achieve this same result.

However, it is not clear that changes in modern social structures will have evolutionary implications. Although it is easy to posit a mechanism whereby competitive women have more surviving children when they live in an impoverished society in the 15<sup>th</sup> century, this mechanism is unlikely to achieve the same result in a wealthy modern society. More realistically, if our result is driven only by evolution and genetics and is independent of the current culture, there is no policy implication. If choices are restrained only by biologically determined personality traits, they cannot be altered. In our own perspective, we are persuaded by the arguments of Turkheimer and Ridley that both explanations are true. In effect, we recognize the role of environment in the behavior of individuals as an important factor.

A static model that sheds insight on the current data patterns can also be constructed. Consider the following schematic model of the interaction of nature and nurture in the competitiveness of men and women. Individuals are born with some tendency to compete  $c$ . Normalize the level of competitiveness to be distributed between 0 and 1, with  $c=0$  denoting a person who never competes, and  $c=1$  a person who always competes.  $c$  denotes the nature part of competitiveness. The distribution of  $c$  could take any shape, and could be gender specific.

The nurture part affects the minimal level of  $c$ , denoted  $c_m$  for which a person would choose to compete in our task. That is, people for which  $c < c_m$  would choose not to compete, whereas those with  $c > c_m$  would choose to compete. The importance of nurture is in the effect on  $c_m$ . Two people who have the same competitive disposition  $c$  may choose differently in different societies. In particular, different societies can affect  $c_m$  differently for men and women. For example, even if the initial disposition of the

competitiveness of women is the same across societies, nurture can move  $c_m$  such that some of the women who would choose to compete in one society would choose not to compete in another.

## **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. One unique aspect of these civilizations is 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 opt to compete at roughly twice the rate as Maasai women, evidence that is consistent with data from Western societies that use different tasks. Yet, this data pattern is reversed amongst the Khasi, where women choose the competitive environment considerably more often than Khasi men. We interpret these results as providing initial insights into the determinants of the observed gender differences.

Viewed through the lens of our modeling framework, our results 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.

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## **Appendix A. Experimental Protocol (Khasi sessions)**

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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,  $\checkmark\checkmark X\checkmark XX\checkmark\checkmark\checkmark\checkmark$  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.

**Table 1 Participant Characteristics and Experimental Outcomes**

	<b>Khasi</b> Mean (Std. dev.)	<b>Maasai</b> Mean (Std. dev.)				
<b>Panel A. Individual Characteristics</b>						
<i>Age</i>	30.9 (16.1)	38.3 (13.9)				
<i>Education</i>	4.3 (3.6)	4.2 (3.9)				
<i>Marital Status</i>						
Single	0.36 (0.5)	0.24 (0.4)				
Married (mono.)	0.44 (0.5)	0.32 (0.4)				
Married (poly.)	0.00 (0.0)	0.36 (0.5)				
Widowed	0.13 (0.3)	0.01 (0.1)				
Divorced	0.08 (0.3)	0.04 (0.2)				
<b>Panel B. Experiment Summary</b>						
			<b>Khasi</b>		<b>Maasai</b>	
			<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>
<i>Compete</i>	0.49 (0.5)	0.38 (0.5)	0.54 (0.5)	0.39 (0.5)	0.25 (0.4)	0.50 (0.5)
<i>Success</i>	2.38 (1.5)	2.75 (1.6)	2.38 (1.6)	2.36 (1.4)	2.89 (1.6)	2.63 (1.5)
<i>N</i>	80	76	52	28	36	40

**Notes:**

*Age* denotes chronological age.

*Education* denotes years of education.

*Marital Status* denotes whether the individual is single, married (monogamous), married (polygamous), widowed, or divorced.

*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).

**Table 2 Regression Results**

	Model I		Model II	
	OLS	Probit	OLS	Probit
<i>Constant</i>	0.50 (0.07)	-0.0001 (0.07)	0.21 (0.40)	-0.29 (0.40)
<i>Female</i>	-0.25 (0.11)	-0.27 (0.12)	-0.27 (0.12)	-0.29 (0.12)
<i>Khasi</i>	-0.11 (0.13)	-0.11 (0.12)	-0.12 (0.14)	-0.13 (0.14)
<i>Khasi*Female</i>	0.40 (0.16)	0.41 (0.17)	0.41 (0.17)	0.43 (0.17)
<i>Age</i>	---	---	0.01 (0.01)	0.01 (0.01)
<i>Age<sup>2</sup></i>	---	---	-0.001 (0.002)	-0.001 (0.002)
<i>Education</i>	---	---	-0.0001 (0.01)	-0.0001 (0.01)
<i>Single</i>	---	---	0.08 (0.19)	0.08 (0.19)
<i>Married Monogamous</i>	---	---	0.06 (0.18)	0.05 (0.18)
<i>Married Polygamous</i>	---	---	-0.07 (0.21)	-0.08 (0.21)
<i>Widowed</i>	---	---	0.08 (0.23)	0.07 (0.23)
<i>N</i>	156	156	152	152

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. Probit estimates are partial derivatives computed at the sample means.

