

# On the cultural basis of gender differences in negotiation

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**Abstract** We study how culture and social structure influence bargaining behavior across gender, by exploring the negotiation culture in matrilineal and patriarchal societies using data from a laboratory experiment and a natural field experiment. One interesting result is that in both the actual marketplace and in the laboratory bargaining game, women in the matrilineal society earn more than men, at odds with years of evidence observed in the western world. We find that this result is critically driven by which side of the market the person is occupying: female (male)

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sellers in the matrilineal (patriarchal) society extract more of the bargaining surplus than male (female) sellers. In the buyer role, however, we observe no significant differences across societies.

**Keywords** Gender · Bargaining · Field experiments · Culture

**JEL Classification** C93 · D03 · J16

## 1 Introduction

Many of us hate the back-and-forth of “let me check with my manager” hassles that accompany a visit to car-dealerships. To address this, General Motors’ Saturn division made a no-haggle pricing part of its sales pitch in the 1990s. According to Babcock and Laschever (2003), one of the results of this policy was that Saturn cars became very popular with women, who amount to roughly 63% of the owners of this model. Apparently women like the haggling experience even less than men.

Women’s dislike to negotiate is documented by a growing body of survey-based and experimental literature. It is found that women are less likely to initiate negotiations; they report greater anxiety than men about negotiating and are less likely to perceive situations as negotiable (e.g., Bowles et al. 2005).

This reluctance to negotiate comes with a price, however. For example, Babcock and Laschever (2003) report that women are significantly less likely than men to negotiate the initial compensation offered to them when hired out of business schools—only 7% of women tried to negotiate, as compared with 57% of men in their sample. Graduates who did negotiate gained an average of 7.4% over the initial compensation. This difference is even more important in the long run because even small differences in starting salaries can result in substantial gaps over time (Bowles et al. 2005; Gerhart and Rynes 1991; Kray et al. 2002; Stuhlmacher and Walters 1999). To compound the issue, women tend to be less assertive in negotiations, initially claiming and ending up with a lower surplus (e.g. Kray et al. 2001; Kray and Thompson 2005).

Why do women fare worse in negotiations than men? One suggested explanation is backlash: it might actually be optimal for women to avoid negotiations or to negotiate less rigorously in situations in which men might benefit from tough negotiating tactics. For example, directive or authoritative leadership style is shown to work against female as compared to male leaders (Eagly et al. 1992; Eagly and Johnson 1990). In this spirit, Bowles et al. (2007) show experimentally that participants penalize female job candidates more than male candidates for assertive negotiation behavior (see also Eckel and Grossman 2008). This explanation is based on the cultural environment in which people negotiate. That is, negotiation behavior

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can be a strategic best response to the expectations imposed upon one's gender. If, for example, a woman thinks that a tough female negotiator would face more rejections, she may hold back even if she does not have a true preference against negotiation. These expectations, in turn, can be crucially shaped by the gender norms in the society.

Another suggested explanation for the gender differences in negotiation rests on preferences: women might simply like to negotiate less aggressively than men or do not know when negotiating is possible or appropriate (see, e.g., Babcock et al. 2006; Croson and Gneezy 2009; Leibbrandt and List 2015). Such differences in preferences have been reported in related areas. For example, women react less strongly than men to competitive incentives, even when the results of the competition are not publicly announced (Gneezy et al. 2003; Gneezy and Rustichini 2004; Niederle and Vesterlund 2007; Gneezy et al. 2009), and women are less willing to take on a leading role in decision-making in risky situations (Ertac and Gurdal 2012).

The preference explanation could have cultural precursors too—women and men are raised differently and as a result, their preferences are shaped differently. It could also have an evolutionary basis because of differences in aggressiveness that are not unique to humans. For example, a large body of literature in evolutionary biology and socio-biology documents differences in competitiveness between males and females in many species (Darwin 1871; Bateman 1948; Trivers 1972).

In this paper we approach the role of culture by studying bargaining behavior in societies with two different sets of gender roles. The first group is the Khasi, which is a matrilineal tribal society where inheritance and economic power flows through the female line. The other group (Kharbi) is patriarchal, with gender roles consonant with those we find in the western world.

Using both a laboratory and a natural field experiment to study bargaining behavior, we observe the negotiation culture in the two groups, permitting us a first test of whether participants from a matrilineal society exhibit different negotiation outcomes and style than those from a patriarchal society. The field experiment studies bargaining in an actual marketplace, where there is selection into buyer and seller roles, whereas the laboratory experiment implements a well-defined alternating-offer bargaining game where roles are randomly assigned. The use of two different settings with varying selection, control, and observability allows us to explore bargaining behavior and the process of bargaining in a detailed manner. For example, selection is perhaps best illustrated by a fact in the field environment: there are no patriarchal female sellers in the market.

In both experiments, the null hypothesis of no difference in bargaining behavior across gender between the cultures is tested against the alternative that women in the matrilineal society are better at bargaining and/or exhibit more aggressive negotiation. Rejecting the null hypothesis in this case implies that women tend to negotiate better/earn higher surplus in societies where there is no social penalty for negotiating (and when the upbringing is more egalitarian than in most societies). That is, such a result would be *consistent* with the notion that social structure matters for bargaining behavior.

Our main finding is that the “women are inferior bargainers” result of the western world can change crucially in a culture where women enjoy greater economic power and are more involved in economic activity. In both the laboratory

experiment and in the actual marketplace, female sellers in the matrilineal society extract more of the bargaining surplus than male sellers. In the lab, where we can make a similar gender comparison within the patriarchal society, we see that this pattern is reversed, and male sellers outperform female sellers. In fact, being a buyer or seller turns out to be an important factor in both the naturally occurring marketplace and the experimental bargaining game: in the buyer role, females in both societies earn similar amounts to males. This result sheds light on the importance of role in extant empirical work and in the market more generally.

The paper contributes to and extends a strand of literature that has examined the underpinnings of gender differences in economic behavior by comparing societies with different gender roles and gender socialization. While some papers have compared two patriarchal societies with different levels of development and gender equality (e.g. Cárdenas et al. 2012), comparing matrilineal and patriarchal societies with stark differences in the structure of rights over ancestral property, household formation and lineage provides a unique opportunity to study the effects of social structure on gender gaps. Differences across matrilineal and patriarchal societies have been studied in the context of competitive behavior (Gneezy et al. 2009; Andersen et al. 2013), altruism (Gong et al. 2015), public good contributions (Andersen et al. 2008), risk preferences and stereotypes (Pondorfer et al. 2017), and the willingness to assume a position of power (Banerjee et al. 2015). The current paper is the first to study the role of social structure in negotiation behavior and outcomes across gender.

The remainder of our paper is structured as follows. Section 2 summarizes our experimental design. Section 3 provides the raw data and inference from the empirical tests. Section 4 concludes.

## 2 Experimental framework

### 2.1 Societal background

The Khasi of Meghalaya, Northeast India, are a unique society for studying gender-related questions in the sense that they are one of the few matrilineal and matrilocal tribes that still exist. Lineage and clan membership are traced through the mother, and men reside in their mother's or their wife's home. The household is therefore organized around females, and inheritance goes to the youngest daughter, who continues to live in the house even if she is married. Although Khasi women do not generally assume the roles held by men in patriarchal societies, they always live in households in which their mother has authority over most household decisions. In addition, they enjoy greater economic power than men, since children and property belong to the women.<sup>1</sup>

What is particularly relevant for the issues explored in the current paper is that women are highly involved in economic activity such as selling products in the market, and in fact Khasi women constitute the sole group of female sellers in the

<sup>1</sup> For a more extensive discussion on the Khasi society please see Gneezy et al. (2009).

marketplace. In the natural field experiment, we contrast the behavior of the Khasi women in the market with male sellers that are non-Khasi (mainly Hindu) and therefore of patriarchal societal origin. In the lab experiment, we contrast the behavior of Khasi males and females with male and female members of the Kharbi tribe, where the social structure is patrilineal and patriarchal. The Kharbi villages in which the experiment was conducted are on the border of Meghalaya and Assam in North East India. These patriarchal villages are geographically close to the Khasi villages, which allow us to achieve greater control in comparisons across the two societies. But, when making comparisons across these societies, we should highlight that other factors might exist to explain the differences that we observe. In this way, we stress that our results are *consistent* with certain hypotheses, not proving them in any sense of the word.

## 2.2 Experimental design and procedures

We conduct two different experiments which complement each other. First, we present a lab experiment in two matrilineal (Khasi) and two patriarchal (Kharbi) villages that is in the spirit of the existing experimental literature on alternating-offer negotiations. This experiment allows us to explore the link between culture and bargaining behavior in a controlled setup with random assignment into buyer and seller roles. In order to see whether the outcomes observed in the lab experiment translate into a field negotiation setting, we next present a natural field experiment in an open market, the Burra bazaar in Shillong, North East India. In the Burra bazaar we explore the differences in bargaining behavior between matrilineal (Khasi) and patriarchal (Hindu) sellers. The villages used for laboratory experiments are located approximately 5 h' drive from Shillong. While the Khasi is of comparable cultural heritage across the two experiments, the Kharbi and the Hindu are not, besides both being patriarchal.

### 2.2.1 Bargaining in the laboratory experiment

The bargaining game in the 'laboratory' involves two players, a buyer and a seller that negotiate over the price of an indivisible good. It is common knowledge that the good has zero value to the seller, and that the buyer is willing to pay a maximum price of 150 for the good. Bargaining proceeds as follows. The seller and buyer simultaneously make a first offer. A coin toss then determines whether the buyer or the seller's first offer is implemented.<sup>2</sup> In case the seller's (buyer's) offer is implemented, the buyer (seller) either agrees to purchase (sell) the good at the given price or rejects the offer. In case of agreement the game ends. In case of a rejection, nature determines whether the game ends or continues. If the game continues, the buyer (seller) makes a counter offer. The seller (buyer) then accepts or rejects the offer. In case of acceptance the game ends and in case of rejection nature determines whether the game continues or ends. Every time there is a rejection, there is an increasing probability that the game ends. In each round this probability equals to

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<sup>2</sup> This allows us to observe the initial demands by both parties.

$r/10$ , where  $r$  is the number of rejections. Therefore, the bargaining game can last up to a maximum of 10 rounds. In case there is no trade, both players receive 0. In case of trade, the seller's payoff equals  $p$  and the buyer's payoff equals  $150-p$ , where  $p$  is the agreed-upon price.<sup>3</sup> As is clear, the laboratory experiment places structure on the bargaining process and implements a finite alternating offer bargaining game.

There were two other treatments ("random team" and "delegation") that included bargaining on behalf of two people. These treatments were conducted in order to understand whether bargaining outcomes would be different in matrilineal and patriarchal societies across gender, when individuals bargain not only for themselves but also on behalf of another person. In these two treatments, there is a team of two players, who both bargain with outside individuals. The team members get the same payoff from bargaining (the total team payoff divided by two), but each member's earnings from bargaining contribute differently to the team payoff. In particular, each team member's payoff is a weighted average of the two team members' earnings in the bargaining tasks. Each player participates in the same bargaining game as in the individual treatment (with subjects outside his/her own team). However, one individual's bargaining outcome is more important for the team payoff than that of the other. Specifically, the team payoffs are given by:

$$\pi_T = 1/3\pi_{NI} + 2/3\pi_I$$

where  $\pi_{NI}$  is the payoff received from the "less important" bargaining game and  $\pi_I$  is the payoff received from the "more important" bargaining game. Each team member receives the same team payoff from the experiment. Which two subjects are in a team together, and who is going to participate in the more/less important game in each team is randomly determined in the "random team" treatment. When they bargain, players know that their earnings from bargaining will constitute 1/3 (2/3) of the total team payoff. The delegation treatment differs from the random treatment in the determination of who participates in the more important bargaining game. While in the random treatment this is determined randomly, in the delegation treatment each player states whether they want to be the one participating in the more important game or leave this to their team partner. In case of a draw (both subjects choosing themselves or their team partner), which player's earnings will count more for the team payoffs is determined randomly. Verbatim instructions for all treatments are provided in online Appendix B.<sup>4</sup>

In this paper, we pool the data from all treatments, and use controls for these treatments and their interactions with society and gender in our regressions. In addition, when we consider the outcomes in these three treatments separately, we see that our main result does not change (Figures A1, A2 and A3 in the online Appendix).

The experiment was conducted in December of 2008 in four different villages in the Meghalaya district of North East India: two Khasi villages and two Kharbi villages on the Assamese border of Meghalaya. The experimental procedures were

<sup>3</sup> The experiments we ran involved two other treatments, which implemented the bargaining game explained above with subjects bargaining on behalf of a team of two people rather than themselves only.

<sup>4</sup> There were no statistically significant differences across society in the propensity to delegate, either within men or women.

the same across societies and villages. Participants were recruited in advance and asked to show up at the village school at a given time. Selection problems were attenuated, given that everyone was interested in participating after learning the pecuniary incentives involved. In total, 320 subjects participated, 166 females and 154 males (80 were in the individual, whereas 120 were in the random team and 120 in the delegation treatment). In each village, there were 20 subjects in the individual and 30 in each of the other two treatments. In each village, 8 sessions were run, all within the same day in a given village. While subjects in one session were making decisions, others were kept in a separate place and were brought in groups when it was time for them to participate, in order to prevent information spillovers. Subjects who had completed this experiment moved on to other experiments/surveys, so they had no opportunity to talk with the subjects who were waiting.

In all treatments, the bargaining room was divided such that sellers were seated on one side of the room while buyers were seated on the other side. The role assignment was done randomly, and the seller and buyer groups could not see each other. While participants did not know whom they were bargaining with, they were made aware of the gender of their bargaining opponent at the start of the bargaining process. Each session had 10 participants, 5 buyers and 5 sellers matched according to their seating order. All buyers had a valuation of 150 Rupees for the good, which was common knowledge. Research assistants who spoke the local language (Khasi for matrilineal villages and Kharbi for patriarchal villages) acted as moderators that took offers back and forth between the two groups. For each bargaining pair, one dedicated assistant was used, in order to reduce errors and facilitate understanding of procedures. After instructions were read and all the subjects made a first offer, a coin was flipped publicly to decide whether it would be the sellers or the buyers whose first offer would be implemented. In all rounds where a rejection was observed, a 10-sided die was thrown publicly to determine whether play would continue to the next round of bargaining or not.

### 2.2.2 *Bargaining in the field*

We conduct natural field experiments (see Harrison and List 2004) in one of Asia's largest markets, the open air Burra bazaar in Shillong, North East India. The market is the city's main poultry, meat and produce market. It is built as a myriad of narrow streets, tiny shops and day-to-day farmers selling their products. The market has many selling agents on each product, and sellers in this market are organized in small geographic locations based on the ethnicity of the sellers as well as the products offered. A unique feature of the market is that the two main ethnic groups represented, the Khasi and the Hindu are from a similar historical background, but with a twist in the structure of gender roles. As explained earlier, the Khasi are a matrilineal tribal society and the Hindu are a patriarchal society where the culture is more coherent with gender roles of the western world.

The experiment involved hiring locals with a flat fee of 500 rupees for the day as buyer subjects, and giving them incentives (receiving the residuals of 30 rupees minus purchase) to bargain towards the purchase of a certain commodity (this approach is in the spirit of the audit study literature, see, e.g., List 2004). Fourteen

locals were hired (16 were hired, but one did not show up and one did not go to the right shops), split between 8 Khasi buyers, 5 males and 3 females, and 6 non-Khasi buyers, 3 males and 3 females, to purchase the same commodity at 12 geographically preselected vendors. The vendors were selected to represent 8 Khasi shops, 4 male sellers and 4 female sellers, and 4 non-Khasi male shops. No non-Khasi female shops were selected since none were present in the market at the day of selection nor at the day of the experiment (out of several hundred sellers).

Buying agents were brought to the market and vendors' geographical locations were discreetly pointed out to the agent days before the experiment. The experiment was conducted on a single day. On the day of the experiment, the geographical location of vendors was checked and confirmed before purchasing began. Buyers were sent to the market irregularly, with between 20 to 40 min intervals, and they were randomly sent to the sellers in random order. Each buyer visited each seller only once. Each buying agent executed up to 12 purchases during the day.

After each purchase was executed, the agent walked out of the market back to the base of the experimental group located at a nearby restaurant. The purchase was observed at a distance by the chief experimenter, another local Indian. It was recorded whether the right shop was approached and incorrect purchases were discarded from our dataset. We obtained data on 156 purchases.

The commodity chosen was tomatoes, since this was a commonly found item with the shopkeepers, and it was possible to locate several hundred different sellers of large quantities of tomatoes. Since sellers usually sell only a few different commodities but each in large supply, having 14 people asking for tomatoes in a given day is not unusual for a seller. Each agent was directed to a pre-selected shopkeeper and instructed to purchase 2 kilograms of 2-day tomatoes on each purchase.<sup>5</sup> The average price was elicited beforehand to be approximately 14 Rupees, and agents were given 30 rupees for each purchase. Any money retained after the purchase was the agent's to keep, and bargaining was therefore incentivized. The on-average extra 16 Rupees was approximately a 30% increase in the fixed payment to the buyer subjects. For each purchase we registered the ethnicity of the seller, gender of the seller, initial price quoted by the seller, final agreed-upon price, and the time taken on bargaining.

### 2.3 Hypotheses

We have several *ex-ante* hypotheses based on the above designs, relating to the effect of social structure on bargaining behavior and outcomes across gender. It should be noted that these hypotheses are valid for both the laboratory and the field experiment. The first behavioral prediction is that males will end up with a larger share of the bargaining surplus than females in the patriarchal society, that is, they will achieve better outcomes in negotiation. We expect that this result will be reversed, or at the least there will be no significant differences in the matrilineal society, if culture has an effect on bargaining performance. The next set of hypotheses pertains to the manner in

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<sup>5</sup> Tomatoes were available in a very limited range of quality since one type of tomatoes was sold in the market. The tomatoes were sold in several different degrees of ripeness, and the agents were told to purchase a ripeness degree locally called a "2-day" tomato. Purchases were monitored, and failure to buy the right type of tomatoes would result in purchase not being paid for. This did not happen.

which negotiation takes place, that is, (1) initial offers (demanded surplus), (2) concessions/rejections, (3) being rejected. We expect that in the patriarchal society, males will demand a larger share of the surplus than females, will reject more than females do, and will concede less on their own offers, that is, they will bargain more aggressively. In the matrilineal society, we would expect these patterns to be reversed. Finally, we predict that females' offers will be rejected more in the patriarchal society and less in the matrilineal society than males' offers.

In what follows, we provide results that test these ex-ante hypotheses. In addition, we analyze bargaining behavior with respect to market role. While role is central to the field experiment because of both its design and the strong selection into buyer and seller roles in the market based on gender/ethnicity, it is also relevant for the lab experiment, especially if subjects carry over insights from the field into the lab.

### 3 Results

#### 3.1 Bargaining in the lab

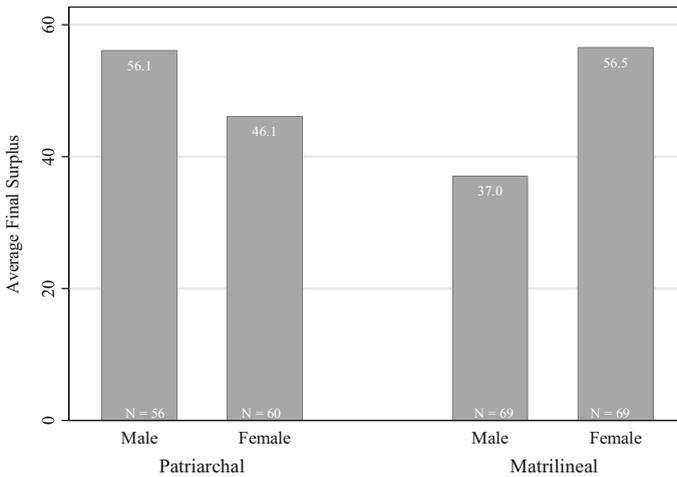
Experimental earnings for both females and males in the two societies are shown in Fig. 1.<sup>6</sup> Females in the matrilineal society earn on average 56.52 and males 37.03. This difference is significant (Mann–Whitney rank-sum test,  $p = 0.004$ ), whereas there is no significant difference in the patriarchal society, where females earn on average 44.4 and males 56.1.

In Fig. 2 we show how the results for the patriarchal society change when we consider market role: patriarchal male sellers earn significantly more than patriarchal female sellers (101.56 vs. 60.5,  $p = 0.005$ ). In the matrilineal society, on the other hand, this pattern is reversed: female sellers earn significantly more than male sellers (74.14 vs. 36.67,  $p = 0.002$ ). There is no significant difference across gender for buyers in either society (see Table A1 in online Appendix A for numbers).<sup>7</sup>

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<sup>6</sup> In our data, 65 sellers and 1 buyer have initial offers larger than 150, the total surplus. These observations come predominantly from the patriarchal villages (44 observations), where a subset of the villagers did not speak the language used in the instructions and had to have the instructions explained by the research assistants in their own dialect. There could be two potential reasons for why this behavior is observed mainly for sellers. First, if the seller subjects were not clearly made aware that buyers had a valuation of 150, they might start with higher offers than 150 (omission of this information, letting sellers know about the buyers' valuation, is more likely than buyers not knowing their own valuation or sellers not knowing their own cost). Another possibility is that if sellers try to signal "toughness" by making an offer that exceeds the pie (although this has no chance of being accepted), we could observe offers exceeding 150. Since we cannot be sure of the true reason, we exclude these observations in our analyses but present related robustness checks. Our main data analyses therefore use 254 observations.

<sup>7</sup> There may be multiple reasons why role may matter in an alternating-offer bargaining setup such as the one we implement. For example, sellers may be prone to loss aversion, in which case we would expect them to demand a higher surplus and be more reluctant to back down. In the market, it may also be that there is asymmetric information about the quality of the product between the buyer and the seller, which could lead sellers to gain a larger share of the surplus. While these factors are less likely to be relevant in our stylized, symmetric bargaining game in the lab experiment, they could still matter if subjects bring over insights from their field experiences to the lab. This is particularly relevant for our results based on gender/society, since there is selection on gender and ethnicity into market roles.



**Fig. 1** Final surplus, by gender and society (lab experiment). *Note* average final surplus is defined as final earnings for subjects in rupees

Table 1 presents these results in a linear regression of earnings on gender, role, society and their interactions. In particular, the regression results show that male sellers earn more than female sellers in the patriarchal society ( $p = 0.002$ ), while male sellers earn less than female sellers in the matrilineal society ( $p = 0.000$ ). None of these results change if we add controls for treatment, or any interactions of treatment with the other independent variables. Moreover, none of the treatment dummies and their interactions is statistically significant. The results are also robust to controlling for age, marital status and education (see online Appendix A, Table A2). These data lead to a first set of results:

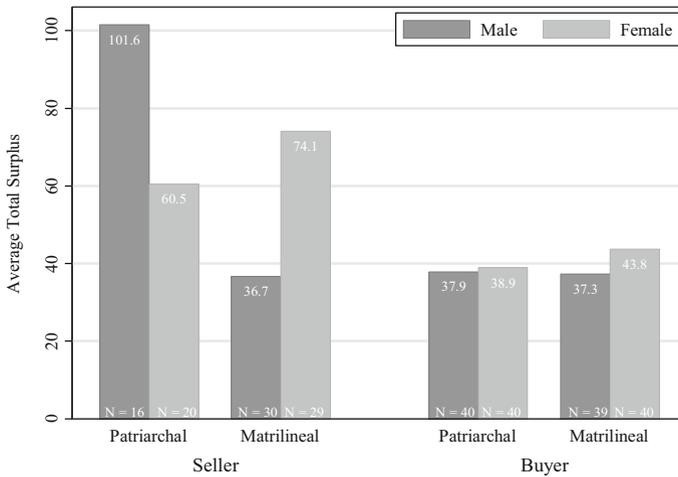
**Result 1:** Overall, females obtain a significantly larger share of the bargaining surplus than males in the matrilineal society, whereas there is no significant difference in the patriarchal society.

**Result 1A:** Consistently with the previous literature on Western societies, male *sellers* in the patriarchal society earn more of the bargaining surplus than female *sellers*.

**Result 1B:** The result reverses for the matrilineal society, where female *sellers* earn more of the bargaining surplus than male *sellers*.<sup>8</sup>

Next, we investigate the reasons behind these main results. We consider three aspects of the bargaining process: (1) the surplus demanded by each bargaining

<sup>8</sup> If we include the include subjects whose initial offers are larger than 150 but who did not initiate the bargaining we get very similar results. In particular, females in the matrilineal society earn on average 58.2 and males 38.7. This difference is statically significant (Mann–Whitney rank-sum test,  $p = 0.002$ ), whereas there is no significant difference in the patriarchal society, where females earn on average 49.1 and males 47.6. Considering market role, matrilineal male sellers earn significantly less than matrilineal female sellers (86.4 vs. 65.6,  $p = 0.02$ ). There is no significant difference across gender for buyers in either society.



**Fig. 2** Final surplus by gender, society, and role (lab experiment). *Note* average final surplus is defined as final earnings for subjects in Rupees

party, (2) the rejections made and faced by each bargaining party, (3) the size of concessions after rejected offers.

First, we explore whether women demand more of the bargaining surplus than men or vice versa in the two societies. We define “desired surplus” as the initial price asked if the subject is a seller, and 150 - initial price offered if the subject is a buyer.<sup>9</sup> Without splitting the data by role, there is no significant difference between the desired surplus of males and females in either society (see Fig. 3).<sup>10</sup>

Figure 4 (as well as Table A3 in online Appendix A) show results by role. Independent of society, subjects in the role of sellers demand more of the surplus than subjects in the role of buyers. In the patriarchal society, males in the seller role demand significantly more of the surplus than females in the same role (132.2 vs. 96, Mann–Whitney rank-sum test,  $p = 0.004$ ), whereas there is no significant difference in the matrilineal society, (93.83 vs. 87.41). For buyers, on the other hand, there is no significant difference in the patriarchal society, while male buyers demand more in the matrilineal society (71.03 vs. 62.38, Mann–Whitney rank-sum test,  $p = 0.054$ ). Table 2 presents these results in a set of regression models.<sup>11</sup> The results are also robust to controlling for age, marital status and education (see online Appendix A, Table A4).

<sup>9</sup> Recall that we collect initial offers for all subjects independently of whether they actually start the bargaining.

<sup>10</sup> The analysis of desired surplus requires that the total surplus sums to 150. Therefore, it is important to exclude the initial offers larger than 150. Recall that most of these offers are made by subjects in the seller role. Looking at those offers exclusively, we see no significant difference between the desired surplus of males and females in either society.

<sup>11</sup> For the patriarchal society, males in the seller role demand significantly more of the surplus than females in the same role using a Wald test for model 1 (2 and 3) in Table 2, with  $p = 0.0003$  (0.0003 and 0.0035, respectively). The following tests are also coherent with the simple ranksum tests, when using standard tests of the coefficients in the regression.

**Table 1** Linear regression, dep. variable: final surplus (lab experiment)

	(1)	(2)	(3)
Constant	101.56*** (9.99)	103.14*** (10.94)	111.63*** (13.89)
Female	- 41.06*** (13.40)	- 41.35*** (13.46)	- 42.09** (17.98)
Matrilineal	- 64.90*** (12.37)	- 64.64*** (12.42)	- 80.06*** (17.93)
Buyer	- 63.69*** (11.82)	- 63.69*** (11.86)	- 63.08*** (11.77)
Buyer × matrilineal	64.33*** (15.29)	64.02*** (15.35)	62.50*** (15.28)
Female × matrilineal	78.53*** (16.96)	78.24*** (17.07)	76.12*** (24.02)
Buyer × female	42.06*** (16.11)	42.03*** (16.16)	43.38*** (16.04)
Buyer × matrilineal × female	- 73.09*** (21.18)	- 72.65*** (21.28)	- 72.33*** (21.12)
Random team		- 3.17 (6.47)	- 14.04 (14.04)
Delegation		- 0.60 (6.57)	- 12.58 (14.53)
Interaction of treatment and controls	No	No	Yes
R <sup>2</sup>	0.178	0.179	0.215

N = 254. \*\*\*, \*\*, and \* significance at the 1, 5, and 10% levels, respectively. Random team and delegation are dummies that capture the treatments in which subjects bargained on behalf of two people. Buyer takes on the value of one if the subject was in the role of a buyer, and zero if a seller. None of the interaction effects are significant

This leads us to the next set of results:

**Result 2A:** Male sellers ask for a higher initial price than female sellers. Differences are statistically significant only in the patriarchal society.

**Result 2B:** Male buyers ask for a significantly higher initial price in the matrilineal society.

As a consequence of these results, matrilineal males lose a significantly higher percentage of the surplus that they initially desired compared to females in the matrilineal society (- 43.9 vs. - 16.4%  $p = 0.001$ ). The differences are neither significant for the patriarchal sellers nor for the buyers in either society (see Table A5 in online Appendix A for summary statistics), and the effect is driven by differences between matrilineal female and male sellers.

We now explore the underlying channels for Results 1 and 2. Rejecting received offers, being rejected often, and being less willing to make concessions after

rejected offers can all play a role in the finding that bargainers end up with a lower surplus than they demanded. In particular, we investigate whether these mechanisms can explain the findings that male sellers in the matrilineal society end up with lower surplus and the reverse happens in the patriarchal society, with no earnings differences on the buyer side.

We first focus on differences across gender and society in terms of (1) whether a subject rejects the offer he/she receives, (2) whether his/her own proposed offer is met with rejection. Table 3 shows the percentages of rejections made and received by subjects who receive and make first offers, respectively.

In the patriarchal society, males and females do not display significantly different rejection frequencies of the first offers they receive, although males reject more often ( $p = 0.28$  in a two-sided test of proportions). In the matrilineal society, males reject the first offers they receive significantly more frequently than females ( $p = 0.005$  in a two-sided test of proportions). Initial offers made by patriarchal males and females do not have significantly different chances of being rejected, whereas initial offers by matrilineal males are rejected more often ( $p = 0.04$  in a two-sided test of proportions).

When we break down by role, we see that in the matrilineal society, male sellers' offers are rejected significantly more than those of female sellers (76% of offers made by matrilineal male sellers are rejected, as compared to 35.3% by females,  $p = 0.008$  in a  $\chi^2$  test). Male sellers in the matrilineal society also reject the offers they receive more than females. In the patriarchal society, there are no such differences in rejections of offers either made or received by male and female sellers.<sup>12</sup> Table A6 in online Appendix A shows that the results are upheld in regressions that control for the desired surplus of the party making or receiving the offer. These data patterns can be collected in a third set of results:

**Result 3:** Males reject, and are rejected more, in the matrilineal society, but there is no such difference in the patriarchal society.

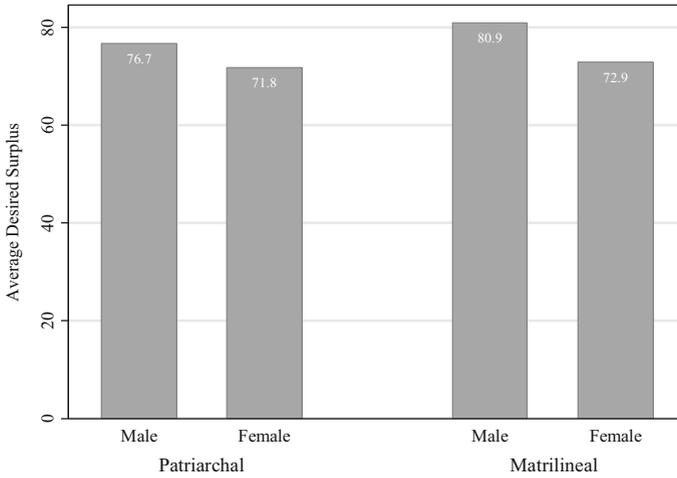
**Result 3A:** Male sellers reject, and their offers are rejected more often, in the matrilineal society.

**Result 3B:** There is no difference in rejections of offers made and received by male and female sellers in the patriarchal society.<sup>13</sup>

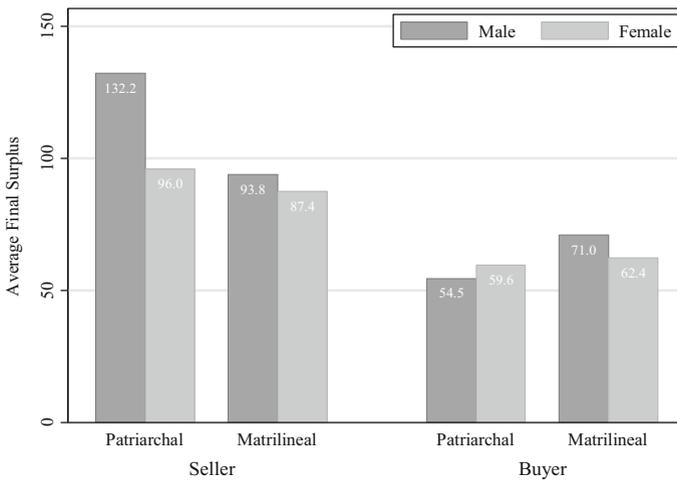
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<sup>12</sup> Likewise, there is no difference in rejection rates of offers made by buyers in either society. However, male buyers in the matrilineal society reject offers more.

<sup>13</sup> We get similar results if we include the subjects whose initial offers are larger than 150. Note that in the analysis of rejecting first offers, it would not make a difference to include subjects whose first offers are higher than 150 and started the bargaining, as these subjects are not faced with an accept/reject decision. Similarly, in the analysis of "being rejected", it is irrelevant to consider the subjects whose initial offers are higher than 150 and did not start the bargaining in the analysis but did not start the bargaining, as these subjects' offers do not reach the other party. In the patriarchal society, males and females' rejection frequencies are not significantly different ( $p = 0.22$  in a two-sided test of proportions). In the matrilineal society, males reject first offers more than females do ( $p = 0.003$  in a two-sided test of proportions). As expected, all the 29 subjects that started the bargaining and whose initial offers were larger than 150 had their initial offers rejected.



**Fig. 3** Desired surplus by gender and society (lab experiment). *Note* desired surplus is defined as the initial offered price for a seller in rupees, and 150 rupees minus initial offered price for a buyer



**Fig. 4** Desired surplus by gender, society, and role (lab experiment). *Note* desired surplus is defined as the initial offered price for a seller, and 150 minus initial offered price for a buyer

The patterns of rejection are also reflected in failed bargains. Recall that in our experiment, after every rejection, there is an (increasing) chance that bargaining will be terminated due to the throw of the die, which results in zero surplus. Overall, 32% of the individuals in our main sample ended up with zero surplus.<sup>14</sup> Figure 5 shows that males in the matrilineal society are much more likely to end up with zero

<sup>14</sup> Out of the 160 pairs in the whole sample, 46 pairs (29%) got their bargaining terminated due to the throw of the die, ending with zero surplus.

**Table 2** Linear regression, dep. variable: desired surplus (lab experiment)

	(1)	(2)	(3)
Constant	132.19*** (7.33)	133.61*** (7.94)	136.49*** (10.20)
Female	- 36.19*** (9.84)	- 36.09*** (9.77)	- 44.09*** (13.21)
Matrilineal	- 38.35*** (9.08)	- 39.19*** (9.02)	- 39.71*** (13.17)
Buyer	- 77.69*** (8.68)	- 77.17*** (8.61)	- 76.61*** (8.65)
Buyer × matrilineal	54.88*** (11.22)	55.62*** (11.15)	53.45*** (11.22)
Female × matrilineal	29.77** (12.45)	31.84** (12.39)	39.72** (17.64)
Buyer × female	41.31*** (11.82)	41.44*** (11.73)	40.73*** (11.78)
Buyer × matrilineal × female	- 43.54*** (15.55)	- 45.39*** (15.44)	- 43.16*** (15.52)
Random team		2.28 (4.70)	2.15 (10.32)
Delegation		- 7.75 (4.77)	- 16.78 (10.67)
Interaction of treatment and controls	No	No	Yes
R <sup>2</sup>	0.341	0.356	0.370

N = 254. \*\*\*, \*\*, and \* significance at the 1, 5, and 10% levels, respectively. Random team and delegation are dummies that capture the treatments in which subjects bargained on behalf of two people. Buyer takes on the value of one if the subject was in the role of a buyer, and zero if a seller. None of the interaction effects are significant

surplus ( $p = 0.001$  in a Pearson’s chi test), which in fact is a major reason why females receive higher surplus in the matrilineal society. An interesting question here is whether failed agreements are more likely among certain gender pairings in the two societies. While low sample size limits the statistical analyses we can conduct, it is possible to get some qualitative insights: male–male pairings in the matrilineal society seem to have the highest likelihood of failing to reach an agreement, as seen in Figure A4 in online Appendix A. Consistently with this, male–male pairings in the matrilineal society have lower surplus (Figure A5 in online Appendix A).

Finally, we examine the size of the concessions after facing a rejection on their offer by focusing on the percentage adjustment between the 1st (rejected) and 2nd offers. Though there are no statistically significant gender differences in any society–role combination at conventional levels, it appears that concessions in addition to rejections can explain part of the results presented above (see Figure A6 in online Appendix A). For instance, female sellers in the matrilineal society are

**Table 3** Frequency of rejections and being rejected (lab experiment)

	Patriarchal		Matrilineal	
	Male	Female	Male	Female
Rejection	86.2% [29]	75.0% [28]	83.3% [30]	50.0% [36]
Being rejected	74.1% [27]	75.0% [32]	69.2% [39]	45.5% [33]

Average rejection rates and the total number of observations in brackets

willing to concede more than male sellers (41.7 vs. 33.4%), while male buyers concede more than female buyers (44.9 vs. 21.9%).<sup>15</sup>

Overall, these results suggest that the higher surplus earned by female sellers in the matrilineal society is in fact mainly driven by male sellers rejecting, being rejected significantly more, and conceding less on rejected offers than female sellers, which increases the likelihood that they end up with zero surplus.<sup>16</sup> In contrast, the higher surplus earned by male sellers in the patriarchal society is not due to differences in rejections, but the higher surplus initially demanded by the males. On the buyer side, although male buyers start with a higher desired surplus, they end up with a similar surplus to female buyers, which is likely due to the larger concession they are willing to make.

### 3.2 Bargaining in the field

When we move from the lab setting to a natural field setting, we are faced with a pool of sellers and buyers that self-select into the market. Gender can be one of the variables that determine this self-selection. In fact, the selection on gender operates strongly enough to lead one group we were able to observe in the lab experiment, the patriarchal female sellers, to be completely absent from the natural market. We therefore have observations based on matrilineal female sellers, matrilineal male sellers and patriarchal male sellers, who are not aware that they are part of an experiment, as well as matrilineal and patriarchal female and male buyers, who, on the other hand, were recruited as experimental participants. The data lead to a first observation:

**Observation 1:** There are no patriarchal female sellers in the market, due to selection on gender in the patriarchal society.

Given our sample, the first question we explore is how female sellers' bargaining performance compares to males, in terms of their earnings in the market.

Figure 6 shows the initial price offered and the final price obtained by Khasi female sellers compared to Khasi and non-Khasi male sellers. We find that Khasi female sellers end up with a significantly higher final price and therefore a higher

<sup>15</sup> The insignificance is likely due to reduced number of observations used in this particular analysis, because we exclude first and second offers that exceed 150. Including these offers does not change the direction of the results.

<sup>16</sup> In fact, the surplus difference between men and women goes away if failed bargains are excluded.

bargaining surplus than both Khasi and non-Khasi male sellers (two-sided Mann–Whitney tests, with  $\alpha = 0.02$  and  $p = 0.00$ , respectively), leading to our next result:

**Result 4:** Khasi female sellers extract more of the available surplus than both Khasi and non-Khasi male sellers.

In order to understand the sources of these differences, we next study: (1) the initial price charged by the seller, (2) the amount of concession made (the difference between the initial price and the final price, as a percentage of the initial price), (3) the amount of time taken to reach an agreement.

Comparing the Khasi female sellers to the Khasi male sellers, we find that females' advantage within the matrilineal society arises from demanding a higher initial price ( $p = 0.01$  in a Mann–Whitney test), whereas the amount of concession or the time used for bargaining is not significantly different. Comparing the Khasi females to non-Khasi male sellers, these results remain, leading to a next result:

**Result 5:** Khasi female sellers charge a higher initial price than both Khasi and non-Khasi males.

Khasi female sellers' advantage in bargaining is also reflected in the ability of buyers to negotiate the initial offer made by the seller. When faced with a Khasi female seller, only 69% of buyers are able to move the price, whereas 81% of buyers faced with any other type of seller successfully gain any concessions ( $p = 0.09$  in a two-sided test of proportions). This leads to a sixth insight:

**Result 6:** Although the average amount of concessions is not different, Khasi females' initial offers are more likely to be accepted without negotiation.<sup>17</sup>

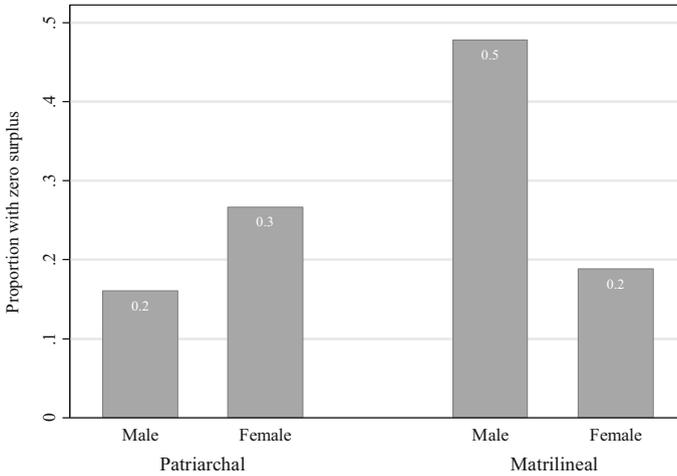
In order to account for the fact that we have multiple observations from the same sellers, and to explore whether the gender and ethnicity of the buyer affects the bargaining measures outlined above, we run a series of random-effects regressions of initial and final price, reported in Table 4. We additionally control for the sale sequence of our shop-owners by allowing for fixed effects on the sale sequence. Regressions in columns 1 and 3 show that Khasi females charge a significantly higher initial price and obtain a higher final price; therefore, Results 4 and 5 are robust when we control for dependence. The results also remain when we additionally control for buyer characteristics (Models 2 and 4).<sup>18</sup>

Although buyers in our experiment know that they are part of an experiment, and are not the focus of our analysis, it might be insightful to explore whether matrilineality makes a difference in the buyer sample. An important measure of bargaining performance for the buyers is the difference between the initial price quoted by the seller and the final price paid by the buyer.

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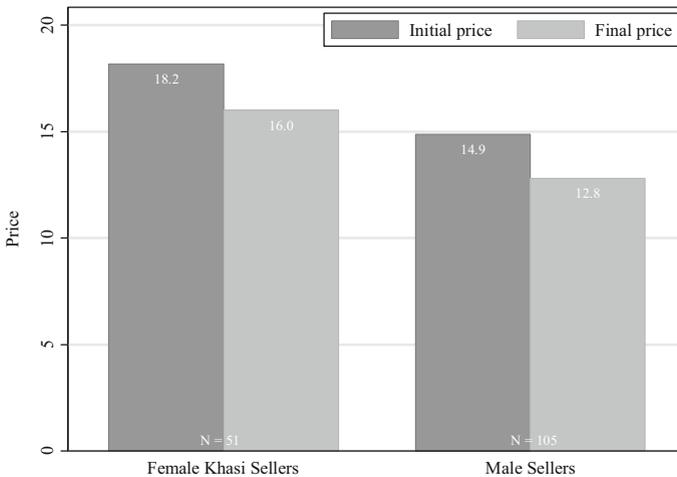
<sup>17</sup> This result may be either due to the unwillingness of the Khasi female sellers to move their sale price down, or due to the reluctance of the buyers to attempt to negotiate with a Khasi female.

<sup>18</sup> None of the buyer characteristics are significant, nor are the controls on sales sequence within shops. Potentially we could allow for further controls on the interaction of gender and ethnicity between selling and buying side. But given the number of observations within each of such combinations, coefficients would be hard to disentangle from a few single sales.



**Fig. 5** Proportion of subjects ending up with zero payoffs (lab experiment)

Using this measure, we find that Khasi female buyers are not significantly different than Khasi male buyers, in the sense that they achieve similar percentage-point concessions from the seller's initial price (Mann–Whitney test,  $p = 0.24$ ). The initial prices they are quoted are not different either ( $p = 0.99$ ). Moreover, Khasi female buyers are not more likely than Khasi male buyers to reject the initial price quoted by the seller ( $p = 0.85$ ). Comparing Khasi female buyers to non-Khasi (patriarchal) female or patriarchal male buyers, we again find no significant differences in behavior along these dimensions. It is interesting to note that patriarchal males and females do not exhibit significant differences in the buyer role



**Fig. 6** Initial and final price in the market (field experiment)

either, in terms of initial price and the initial-final price difference. This leads to our final result:

**Result 7:** In the buyer role, there are no significant differences between males and females in either society.

## 4 Discussion

Whether, and to what extent, societal forces influence propensities to bargain and resource allocations from those bargains is of first order import. By exploring behaviors in both the lab and the field in societies that are characterized as nearly polar opposites in the treatment of women, we are permitted a unique glimpse into one case study on those bargaining differences. Our data collection strategy allows for a rich set of results because synergies between the lab and the field allow us to make inferential statements that we could not make if we had each experiment in isolation. However, an important caveat is that our work can only shed preliminary insight into this issue, as other, unobservable factors between the two experimental settings might underlie our findings (an example is differences in the extent of bargaining experience between our lab and field sample). In this light, our results should be viewed as merely a first attempt at estimating the importance of societal forces on bargaining proclivities and outcomes.

With that caveat in mind, our main result is that matrilineal females earn more surplus in bargaining than matrilineal males, providing evidence that bargaining outcomes across gender can be crucially culture-dependent. The observed pattern is consistent with the notion that women do not have an inherent, natural disadvantage in bargaining.

The data also highlight that the particular role in the marketplace might be critical to the results. Given that Khasi females act frequently as sellers in the actual marketplace and non-Khasi females only have experience in the buyer role, the results that (1) female sellers earn more than male sellers in the matrilineal society, with the reverse happening in the patriarchal society, and (2) females earn similar surplus to males in the buyer role in both societies (weakly higher surplus in the matrilineal society) suggest that subjects may carry over insights from their daily economic experience into the lab setting.

While in terms of earnings matrilineal women do better than men in both experimental domains, we find that women do not use the same strategies in reaching their outcomes. An important difference between bargaining in the actual market and bargaining in the lab is that risk likely plays a bigger role in the latter. Since there is a probability that the game ends and the surplus is destroyed, being a tough bargainer can be a more detrimental strategy than in actual face-to-face bargaining.<sup>19</sup> Although matrilineal female sellers act tougher in the actual market, they start with a lower demand and reject less in the bargaining lab game. This

<sup>19</sup> In fact, there is research that shows that the mode of communication (face-to-face vs. non-face-to-face) and anonymity can crucially affect negotiation outcomes, with anonymous and non-face-to-face communication often leading to less “integrative” outcomes (e.g. Stuhlmacher and Citera 2005).

**Table 4** Final and initial prices by selling ethnicity and gender (market experiment)

	Final price		Initial price	
	(1)	(2)	(3)	(4)
Constant	11.19*** (1.06)	11.13*** (1.21)	13.61*** (1.02)	13.39*** (1.16)
Female	4.30*** (1.06)	4.27*** (1.17)	4.41*** (0.83)	4.37*** (0.89)
Matrilineal	2.64** (1.06)	2.60** (1.17)	2.51*** (0.84)	2.47*** (0.89)
Sell sequence control	Yes	Yes	Yes	Yes
Buyers ethnicity control	No	Yes	No	Yes
Pseudo R <sup>2</sup>	0.304	0.305	0.293	0.294

N = 156. This table use the final (initial) price as dependent variable. In all columns, we control for shop characteristics by random effect at the shop level, and order effects by fixed effects on the sale sequence within each shop. In column 2 and 4, we additionally control for ethnicity and gender of the buying agents. We have 156 purchases over the groups of 12 shops. \*\*\*, \*\*, and \* significance at the 1, 5, and 10% levels, respectively

behavior by women could be due to a better understanding that the nature of the game is different, or due to higher risk aversion. In contrast to females, matrilineal males ask for more, and their offers are more frequently rejected even after controlling for demanded surplus; this leads to them getting a lower surplus in bargaining.

Finally, the fact that women's offers are rejected less often in the matrilineal society (controlling for the demanded surplus) might suggest that female sellers in the actual marketplace can afford to be tough. Since actual trading in the marketplace is face-to-face and does not end exogenously, matrilineal women might have a better environment to exercise or try out high demands, and a norm of female sellers being tougher bargainers might have evolved. In the laboratory, on the other hand, caution may prevent them from applying such a strategy.

While societal structure and gender roles may shape underlying preferences (aversion to negotiation, views of entitlement) differently for men and women, these results are also consistent with strategic behavior. That is, women's behavior may be a best response to the negotiation environment. For example, even without any preference differences between matrilineal and patriarchal females, in matrilineal societies women may find it easier to demand a higher surplus because it is more acceptable for females to behave that way, and their offers are less likely to be rejected.

In conclusion, our paper provides a first exploratory analysis of how culture might impact alternating-offer bargaining behavior. One interpretation is that the matrilineal culture economically empowers women and gives them an active role in economic transactions, which results in a payoff advantage for women in two different types of bargaining contexts. Giving women more experience in bargaining or related monetary decisions might therefore be quite conducive to

enhancing outcomes. Further research is needed to more fully explore the effects of culture and other structural variables on the interaction of gender and bargaining outcomes.

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