Ca' Foscari University of Venice

Department of Economics

Working Paper

Daniela Di Cagno, Arianna Galliera, Werner Güth, Noemi Pace, and Luca Panaccione

Experience and Gender Effects in an Acquiring-a-Company Experiment Allowing for Value Messages

ISSN: 1827-3580
No. 30/WP/2015

Working Papers
Department of Economics
Ca' Foscari University of Venice
No. 30/WP/2015
ISSN 1827-3580

Experience and Gender Effects in an Acquiring-a-Company Experiment Allowing for Value Messages

Daniela Di Cagno *and* **Arianna Galliera**
Luiss Guido Carli, Rome

Werner Güth
Luiss Guido Carli, Rome, Frankfurt School of Finance and Management, Max Planck Institute, Bonn, Germany

Noemi Pace
Ca' Foscari University of Venice

Luca Panaccione
DEDI and CEIS, University of Rome Tor Vergata

Abstract: This paper focuses on a bargaining experiment in which the privately informed seller of a company sends a value message to the uninformed potential buyer who then proposes a price for acquiring the company. Participants are constantly in the role of either seller or buyer and interact over 30 rounds with randomly changing partners in the other role. We test how overstating the value of the company, underpricing the received value message and acceptance of price offers are affected by experience and gender (constellation). Like in our companion paper on single play (Di Cagno et al. 2015) we control via treatments for awareness of gender (constellation). One main hypothesis is that gender (constellation) matters but that the effects become weaker with more experience and that the main experience effects apply across gender (constellations).

Keywords: bargaining, cheap-talk, experience effect, experiment, gender, winner's curse.

JEL Codes: C78, C91

Address for correspondence:
Noemi Pace
Department of Economics
Ca' Foscari University of Venice
Cannaregio 873, Fondamenta S.Giobbe
30121 Venezia - Italy
Phone: (++39) 041 2349187
Fax: (++39) 041 2349176
e-mail: n.pace@unive.it

The Working Paper Series
is available only on line
(http://www.unive.it/nqcontent.cfm?a_id=86302)
For editorial correspondence, please contact:
wp.dse@unive.it

Department of Economics
Ca' Foscari University of Venice
Cannaregio 873, Fondamenta San Giobbe
30121 Venice Italy
Fax: ++39 041 2349210

Experience and Gender Effects in an Acquiring-a-Company Experiment Allowing for Value Messages

D. Di Cagno[*], A. Galliera[†], W. Güth[‡], N. Pace[§], L. Panaccione[¶]

September 22, 2015

Abstract

This paper focuses on a bargaining experiment in which the privately informed seller of a company sends a value message to the uninformed potential buyer who then proposes a price for acquiring the company. Participants are constantly in the role of either seller or buyer and interact over 30 rounds with randomly changing partners in the other role. We test how overstating the value of the company, underpricing the received value message and acceptance of price offers are affected by experience and gender (constellation). Like in our companion paper on single play (Di Cagno et al. 2015) we control via treatments for awareness of gender (constellation). One main hypothesis is that gender (constellation) matters but that the effects become weaker with more experience and that the main experience effects apply across gender (constellations).

Keywords: bargaining, cheap-talk, experience effect, experiment, gender, winner's curse.
JEL: C78; C91

1. Introduction

Cheap talk has been shown to improve coordination, e.g. in game experiments with multiple equilibria, and to crowd out costly punishing, e.g. in ultimatum game experiments, where it represents a less costly alternative for expressing own anger or disappointment. Cheap

[*]Luiss Guido Carli, Rome, Italy. E-mail: ddicagno@luiss.it
[†]Luiss Guido Carli, Rome, Italy. E-mail: agalliera@luiss.it
[‡]Luiss Guido Carli, Rome, Italy, Frankfurt School of Finance and Management, Max Planck Institute on Collective Goods, Bonn, Germany. E-mail: gueth@coll.mpg.de
[§]University Ca' Foscari of Venice, Venice, Italy. E-mail: n.pace@unive.it
[¶]DEDI and CEIS, University of Rome Tor Vergata. E-mail: luca.panaccione@uniroma2.it

talk may reduce or even resolve the problem of asymmetric information which can lead to no-trade results as in markets for lemons (Akerlof, 1970) and in the Acquiring-a-Company game (Samuelson and Bazerman, 1985).

To the best of our knowledge, little research has been directed towards the role of cheap talk in experiments on bargaining with focus on experience and gender effects. Considering cheap talk and gender, Dreber and Johannesson (2008), as well as Erat and Gneezy (2011), find that men are more likely to lie for a monetary gain than women and Houser et al. (2012) observe that men are more likely to incorrectly report the result of a private coin flip than women, yet they do not investigate whether those gender differences in cheap-talk persist when controlling for experience. On the other hand, even if several studies investigate gender differences in preferences and behavior [1], very few jointly focus on experience and gender effects. Casari at al. (2007), who study the winner's curse in common value auctions to understand how experienced bidders learn to avoid it, find that women are much more susceptible to the winner's curse as inexperienced bidders than men with this difference disappearing for experienced bidders. Their estimates also show that women learn much faster than men: they start out bidding much worse only to close much of the gap in the final periods. Further Ham and Kagel (2006) find that even though inexperienced women bid substantially more than men in the beginning, they learn at a faster rate and subsequently close the gender gap in later experimental sessions. Ortmann and Tichy (1999), focusing on cooperation in a prisoner's dilemma-type game, find that women cooperate significantly more than men in the first round but that this difference disappears in the last round.

We analyze the combined effect of cheap talk, experience and gender in a bargaining experiment in which the privately informed seller of a company sends a value message to the uninformed potential buyer who then proposes a price for acquiring the company. Thus

[1] Croson and Gneezy (2009) provide an extensive overview of gender differences documented in studies on risk attitude, social preferences (ultimatum and dictator games, trust and reciprocity, prisoner's dilemmas, social dilemmas and public good provision) and competitive behavior.

the Acquiring-a-Company game, developed by Samuelson and Bazerman (1985), is modified by allowing for an initial (cheap talk) value message from the privately informed seller to the buyer, who then proposes a take-it-or-leave-it price offer to the seller. As in a signaling game the uninformed buyer might infer some information from the value message about the true value of the firm owned by the seller. However, sellers of low value firms should also send high value messages, i.e. in the suggestive terminology of Erat and Gneezy (2011), one should expect "selfish black lies", which we will refer in our context as "making up" the value of the firm. [2] Therefore, only pooling equilibria emerge with the same uninformative (high) value messages sent by sellers.

This game-theoretic rigor used to establish only pooling equilibria or, in other words, disqualifying value message as "cheap talk" is due to the strict rules of social exchange: the one sided value message of the seller to the buyer is one social exchange before the buyer states the take-it-or leave it price offer. This differs from the study of Valley et al. (1998) who also allow for social exchange in the context of Acquiring-a-Company, only in different face communication formats (face-to-face bargaining, written negotiation exchange, telephone negotiations).[3] This obviously excludes strict game-theoretic reasoning but, as expected, is quite efficiency enhancing with the strongest effect, with respect to fair surplus sharing, for face-to-face negotiations. Here we wanted to maintain the strict strategic format by implementing the Modified Acquiring-a-Company setup as a Bayesian game as much as possible, thus allowing for many repetitions (which would be difficult for the Valley et al. (1998)-setup) and restricting identifiability of one's interaction partner to either gender or field of study, or both. As such we feel that we are, to the best of our knowledge, pioneering in jointly analyzing the three dimensions involved in our study, namely cheap talk, gender (constellation) and experience.

[2]Note, however, that according to our data such incentives for "selfish black lies" (Erat and Gneezy, 2011) also exist significant and persistent understating and truth-telling.

[3]Valley et al.(2002) compare such free format replay communication for situations with two-sided incomplete information with a no communication control treatment.

Behaviorally cheap talk may matter. Indeed, according to our companion study Di Cagno et al. (2015), based on a single incentivized play of this game, it is found that value messages positively and significantly increase price offers. Will experience strengthen or weaken this effect? We expected the latter, i.e., convergence to pooling. On the other hand, trade is always efficiency enhancing and at least some seller participants might be intrinsically motivated to signal the true value. We repeated the same experimental setting to analyze data from participants interacting in 30 rounds (with fixed role of either seller or buyer and randomly changing partners in the other role) in order to test how overstating the value of the company, underpricing the received value message and acceptance of price offers are affected by experience and gender (constellation). By comparing three successive phases consisting of 10 rounds each, labeled *early* phase (rounds 1 to 10), *intermediate* phase (rounds 11 to 20) and *late* phase (rounds 21 to 30), we analyzed how experience affects acceptance of price offers, price offers and value messages. What this indicates is that we are interested in experience effects but not in individual learning (see the chapter on individual learning in Camerer, 2003). Quite surprisingly, there is a constant positive share of participants investing in role reputation by not overstating (their firm's value). It seems to depend on intrinsic motivation and social dynamics whether behavior converges to pooling or whether some trust in value messages pertains, possibly together with price offers aimed at fairly sharing the surplus from trade. We expected that some significant share of participants to frequently and persistently signal the value[4] but were surprised by the significant and persistent understating. Of course, the latter might be accounted for by other regarding concerns (one may want to distinguish oneself from other seller participants with excessively large signals or compensate the harm caused by other buyer participants' price offers). However, in our view, it seems less far-fetched to achieve such effects by truth-telling: the evidence of understating by seller participants is puzzling.

[4] To expect consistent truth telling when often and repeatedly meeting traders, who obviously experienced overstating, would put too much trust in "Kantian imperatives".

Our design offers data:

1. for seller participants: mainly overstating (”making up”), but also truth-telling and understating (the value of one’s firm) as well as (non) acceptance of (non) profitable price offers,

2. for buyer participants: price offers which are systematically lower than the value message received (“suspicion”or “equal surplus sharing”or weaker forms of letting both sides gain) and based on more or less trust in value messages,

3. for gender (constellation): according to which female acceptance is to a greater extent influenced by experience than the male one, in suspiciousness gender constellation seems to interact with path dependence for females (female buyers are more suspicious when confronting male sellers) and gender difference co-evolves with ”making-up” (female sellers are only significantly less overstating than males in the early phase). An obvious hypothesis claims gender (constellation) effect to be considerably weakened or even eliminated by game playing experience and suggests that gender (constellation) effects mainly rely on data of inexperienced decision making. Since treatments partly allow for commonly known gender constellations, this does not only apply to conditioning behavior on once own gender but also on another’s gender.

“Making up” and “suspicion” persist, gender (constellation) effects seem to be rather paradigmatic, given the different tasks and skills of human males and females in our evolutionary history (see also the related discussion in our companion paper). In our view, gender research has thus far neglected the aspects on which we focus on.

Finally, it hardly needs to be justified that “making up” (consider not only commercial but also private life, e.g. when searching a spouse) and “suspicion” (in commercial and private life we often doubt what others can offer) are important. Altogether it seems very interesting and informative to compare behavior of inexperienced and experienced participants, who both matter economically, e.g. when designing spot markets whose traders change frequently, respectively when establishing institutions which are to be encountered repeatedly.

The paper develops as follows: Section 2 introduces the modified game. Section 3 describes the experimental protocol. Descriptive statistics are discussed in Section 4. Section 5 provides the regression analysis. Section 6 concludes.

2. Game Model

The buyer's value v of the firm, owned by the seller, is randomly generated according to the uniform density concentrated on $(0, 1)$. This is commonly known along with the fact that for the seller the value of the firm is only qv, with $0 < q < 1$. If trade occurs at price p, the buyer earns $v - p$ and the seller $p - qv$. The decision process in each round is as follows:

(i) knowing v, the seller sends the value message $\hat{v} = \hat{v}(v)$ which might be true $(\hat{v} = v)$ or false $(\hat{v} \neq v)$;

(ii) after receiving the message $\hat{v}$, the buyer proposes the price $p = p(\hat{v})$;

(iii) after receiving the price offer, the seller accepts it $(\delta(p) = 1)$ or rejects it $(\delta(p) = 0)$.

The seller earns $\delta(p)(p - qv)$ and the buyer $\delta(p)(v - p)$: when trading, i.e., when $\delta(p) = 1$, the total surplus $v(1 - q)$ is always positive. When not trading, i.e., when $\delta(p) = 0$, both buyer and seller earn nothing.

Since $\delta(p) = 1$ is only optimal for $p \geq qv$, a risk neutral buyer expects to earn

$$\int_0^{p/q} (v - p)\, dv = (0.5 - q)\, \frac{p^2}{q^2} \tag{1}$$

which increases (decreases) with p for $q < 0.5$ $(q > 0.5)$. Since $v < 1$ implies $vq < q$, it is never optimal for the buyer to offer a price higher than q: the price $p = q$ is optimal for

$q \leq 0.5$ whereas trade is avoided by $p = 0$ for $q > 0.5$. This benchmark solution is not questioned by cheap talk.

The Acquiring-a-Company game is a convenient experimental workhorse designed to study the winner's curse, even when allowing for cheap talk. Indeed, buyer participants may fail to anticipate that positive price offers are accepted only if $v \leq p/q$. This then might induce them to offer prices p which yield (assuming $\delta(p) = 1$ whenever $p \geq qv$) less than predicted. Of course, the benchmark solution denies the existence of a winner's curse. How is the benchmark solution, based on buyer's risk neutrality and backward induction, then questioned when (i) the seller may be averse to overstating, i.e., to send a value message $\hat{v}(v) > v$ and (ii) the buyer may or not be aware of the seller's moral concerns? The game theoretic approach would investigate these modifications via a signaling game with the better informed (about the firm's value as well as their own guilty feelings) seller moving first so that the uninformed buyer can possibly infer the firm's value from the value signal $\hat{v}$: an interesting analytic exercise but an extremely unrealistic one since the seller's idiosyncratic feelings of guilt will never be common knowledge.[5]

Still one might want to speculate how behavior is affected when − at least some − seller participants are feeling obliged to tell the truth. When expecting this, buyer participants may believe the message $\hat{v}$ and suggest a price between $q\hat{v}$ and $\hat{v}$. Quite fairness-minded buyer participants might even propose the price $p(\hat{v}) = \frac{(1+q)\hat{v}}{2}$ in order to share the surplus from trade $(1 - q)\hat{v}$ equally: actually quite a number of seller participants feel obliged to choose $\hat{v}(v) = v$, with many price offers lying between $q\hat{v}$ and $\hat{v}$. However, cheap talk value messages more frequently induce opportunistic sellers to try to exploit buyers by "making up" via $\hat{v}(v) > v$ and this, in turn, questions buyers' trust in the message sent by their seller. We expected that because of learning most participants will not trust the value messages which also discourages attempts to share the surplus (more or less) equally. This denies cyclic adaptations, e.g. in the sense of trustworthiness ($\hat{v}(v)$ close to v) and trusting ($p(\hat{v}) > \hat{v}$)

[5]The common priors assumption in the tradition of Harsanyi (1967-1968) is philosophically interesting, and possibly informative, but very unrealistic.

first evolving, then eroding before again recovering.

3. Experimental protocol

We refer here to the basic part of our broader experimental project − we analyze experience and gender effects.[6] This stage consists of playing the same bargaining game for 30 rounds and has been preceded by one incentivized trial round which should allow our participants to understand their decision tasks in the following 30 rounds.[7] We ran 12 sessions with a total of 376 students (11 sessions with 32 participants each plus one session with 24), recruited among the undergraduate population of Jena University using Orsee (Greiner, 2004), at the laboratory of Max Planck Institute in Jena. The experiment was fully computerized using z-Tree (Fischbacher, 2007).

At the beginning of the experiment, each participant is randomly assigned to one of the two possible roles (seller or buyer) and remains in this role throughout the experiment: half of the participants are buyers; the other half sellers. Without being made aware of this, half of the sellers and buyers were male and the other half females. In each round participants were randomly matched with a partner in the other role in order to possibly trade the firm owned by the seller. The value of the firm v, randomly selected for each seller-buyer pair according to a discrete uniform distribution concentrated on $(0, 100)$, is told only to the seller (the actual values in the experiment, selected in steps of 5, were 5, 10, ..., 95). Both (seller and buyer) are aware of the proportion (q), correlating the true evaluations v and qv linearly. This proportion q is randomly selected from a discrete uniform distribution $(0, 1)$; the actual values q in the experiment were rescaled in % and could only assume the following values: 10, 20, 30, 40, 50, 60, 70, 80 or 90 percent.

In each round (see Table 1) bargaining proceeds in the following way: the seller sends a value message ($\hat{v}$) to the buyer which can be true or false but not exceed 100. After receiving

[6]The English translation of the Instructions of the whole experiment is reported in Appendix B.

[7]For the results of the incentivized trial round refer to Di Cagno et al. (2015)

Table 1: Road map of game rounds

Step[†]	Seller	Buyer	Description
0	q, v known Partner information[⋆]	q known Partner information[⋆]	Initial information provided to buyers and sellers
1	Message $\hat{v}$	⌛	Seller sends message to Buyer
2	⌛	Price offer $p(\hat{v})$	Buyer makes price offer
3	Acceptance $\delta(p)$	⌛	Seller accepts or refuses price offer
4	Payoff $\delta(p)(p - qv)$	Payoff $\delta(p)(v - p)$	Seller and Buyer informed on payoff

[†] Each round involves four-steps.

[⋆] Partner information depends on the treatment, see Section 3.1.

⌛ Participants wait for partner's decision, i.e. they are inactive.

the message, the buyer proposes a price p which cannot exceed 100. Having received the price offer, the seller can accept it or not. If accepted, the firm is sold at the offered price; if not, no trade takes place. After each round, payoffs are calculated and privately communicated to buyer and seller.

3.1. Treatments

We ran four treatments differing in information only: in treatment U (Unknown), trading partners, randomly matched in pairs, are unaware of the other's gender, which becomes known in treatment G (awareness of Gender constellation). Treatment OC (Other Confound) provides information about the field of study instead (Economics versus Non-Economics). Finally, treatment E (Embedded gender constellation) provides information about the other's gender and field of study. With the last treatment we try to check possible demand effects when informing about gender (constellation).

3.2. Matching

Random matching between buyers and sellers was implemented to balance our sample by gender constellation. Pairs occurred in equal proportion: male buyer/female seller, male buyer/male seller, female buyer/male seller and female buyer/female seller. Participants were reminded in each round that they have been randomly paired.

3.3. Payment

At the end of each round, participants were informed about their final payoff for that round (in ECU). The conversion rate from experimental points to euro (1 euro=30 ECU) was announced in the instructions. If the seller accepted the offered price, the buyer earned the difference between the value of the firm and the price ($v - p$) and the seller the difference between the accepted price and her evaluation of the firm ($p - qv$). If the price was not accepted, the final payoff for both was zero. Participants received an initial endowment of 300 ECU (10 euro) in order to avoid bankruptcy. The actual payment was based on one randomly selected round.

4. Descriptive statistics

We analyze here how experience affects (*i*) acceptance of price offers, (*ii*) price offers p and suspicion $\hat{v} - p$, (*ii*) value messages $\hat{v}$ and "make-up" $\hat{v} - v$ by comparing three successive phases consisting of 10 rounds each and labeled *early* phase (rounds 1 to 10), *intermediate* phase (rounds 11 to 20) and *late* phase (rounds 21 to 30).

4.1. Sellers' Acceptance

We consider three intervals for price offers, depending on who gains, respectively suffers a loss from acceptance: $p \leq qv$ so that buyers gain and sellers suffer a loss; $qv < p < v$ when both, sellers and buyers, gain; $p \geq v$ so that sellers gain and buyers lose (see Figure 1). Figure 2 illustrates the offers by phase and the probability of acceptance for the three price intervals. Table 2 reports the probability of acceptance by gender.

The share of price offers with $p \geq v$ is decreasing across phases from 31.06% to 22.71%. Such offers are nearly always accepted. The share of price offers with $p \leq qv$ increases across

Figure 1: Intervals of price offers

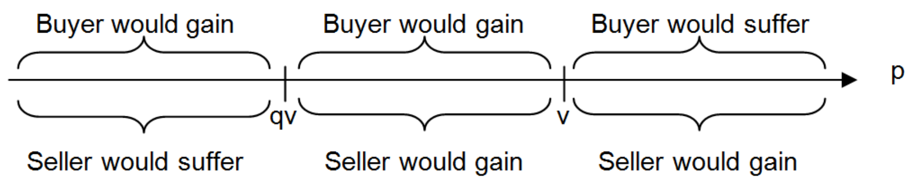
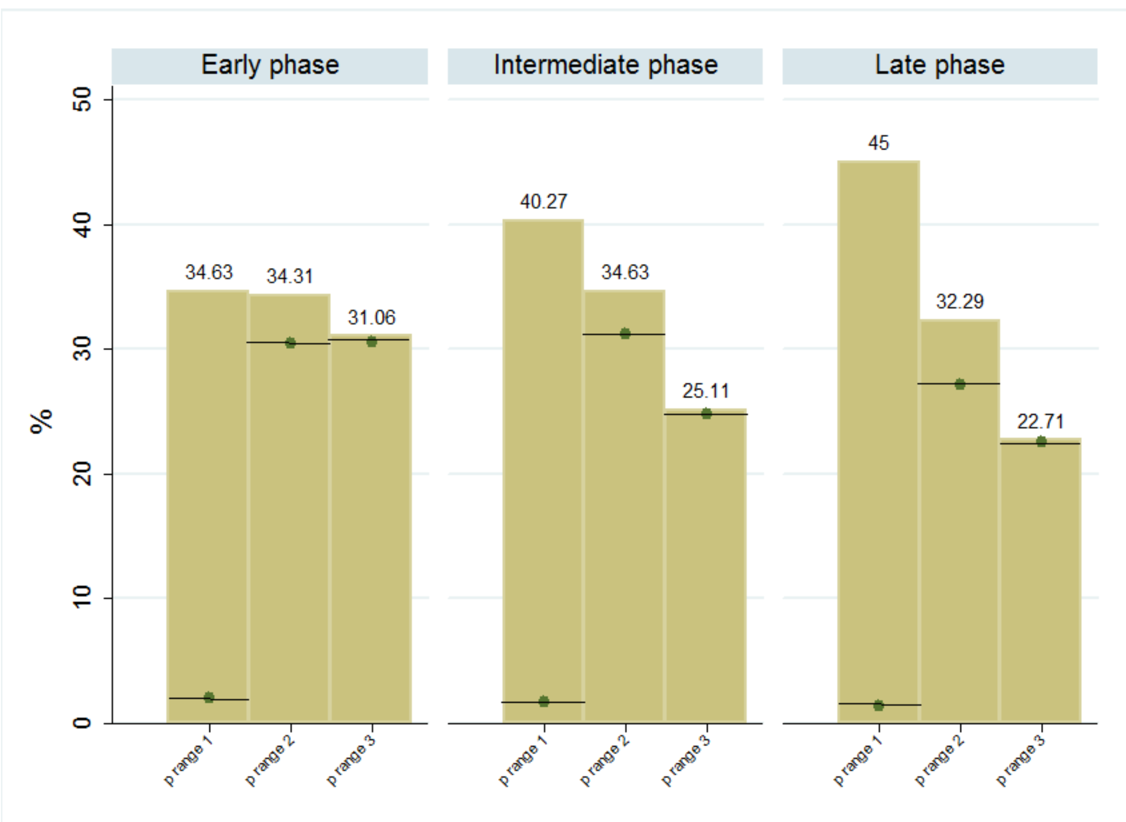


Figure 2: Price offers by phase



Notes: *p range 1*: $p \leq qv$; *p range 2*: $qv < p < v$; *p range 3*: $p \geq v$. Horizontal lines are the acceptance probabilities.

Table 2: Probability of acceptance

	Early phase†			Intermediate phase†			Late phase†			All rounds†			Ttests: Early-Late⋆		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq qv$	6.99	4.66	5.84	4.44	4.28	4.36	2.85	3.53	3.19	4.59	4.1	4.35	(0.01)	(0.44)	(0.01)
	(0.21)			(0.91)			(0.575)			(0.572)					
$v > p > qv$	88.72	89.91	89.3	89.84	90.48	90.17	82.15	86.13	84.18	87.02	88.89	87.97	(0.02)	(0.15)	(0.01)
	(0.63)			(0.79)			(0.18)			(0.21)					
$p \geq v$	97.88	99	98.46	97.93	99.57	98.73	99.1	99.51	99.3	98.26	99.32	98.79	(0.28)	(0.53)	(0.22)
	(0.21)			(0.11)			(0.96)			(0.06)					

† Test for difference in means by gender within stage are reported in parenthesis (P-values).

⋆ Test for difference in means between early and late phase for males, females and pooled observations.

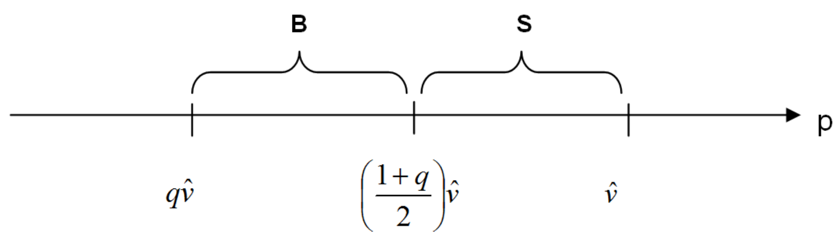
phases from 34.63% to 45%. Such offers are mostly refused (see Figure 2).

For male sellers, the probability of refusing an offer with $p \geq v$ is close to zero in every phase. For female sellers, the probability of refusing an offer with $p \geq v$ is slightly higher than for male sellers in each phase and decreases across phases (see Table 2). For male sellers, the probability of accepting an offer with $p \leq qv$ is non-negligible but decreases across phases from 4.66% to 3.53%. For female sellers, the probability of accepting an offer with $p \leqslant qv$ is higher than for male sellers in the early phase and lower in late phase (see Table 2).

Gender difference is never significant, even though it is larger in the early phase, it tends to disappear in the late phase, mainly due to female sellers who seem to have been influenced more by experience (in fact, female sellers decrease the acceptance rate significantly through time, whereas male sellers keep it constant). Furthermore, acceptance behavior is not influenced by other regarding preferences: there is no evidence of "altruistically minded" sellers rejecting high price offers to protect buyers from losses, i.e., for refused price offers $p > v$, which is reinforced across phases.

The share of price offers from which both sellers and buyers gain, are fairly constant across phases with the probability of accepting them declining over time. Time lapses to accept price offers decline across rounds, revealing clear experience effects for both, female and male sellers. Moreover, the time lapse is shorter when it is obvious to accept ($p \geq v$) than when it is obvious to refuse (when $p \leq qv$). When both, sellers and buyers, would gain the time lapse become longer (see Appendix A, Table 11).

Figure 3: Regions of price offers



Result 1. *Acceptance of price offers yielding a loss for the seller is rare and decreases with experience. Moreover, sellers do not protect buyers who would lose by trading. Gender differences in acceptance behavior tend to disappear with experience.*

4.2. Price offers and suspicion

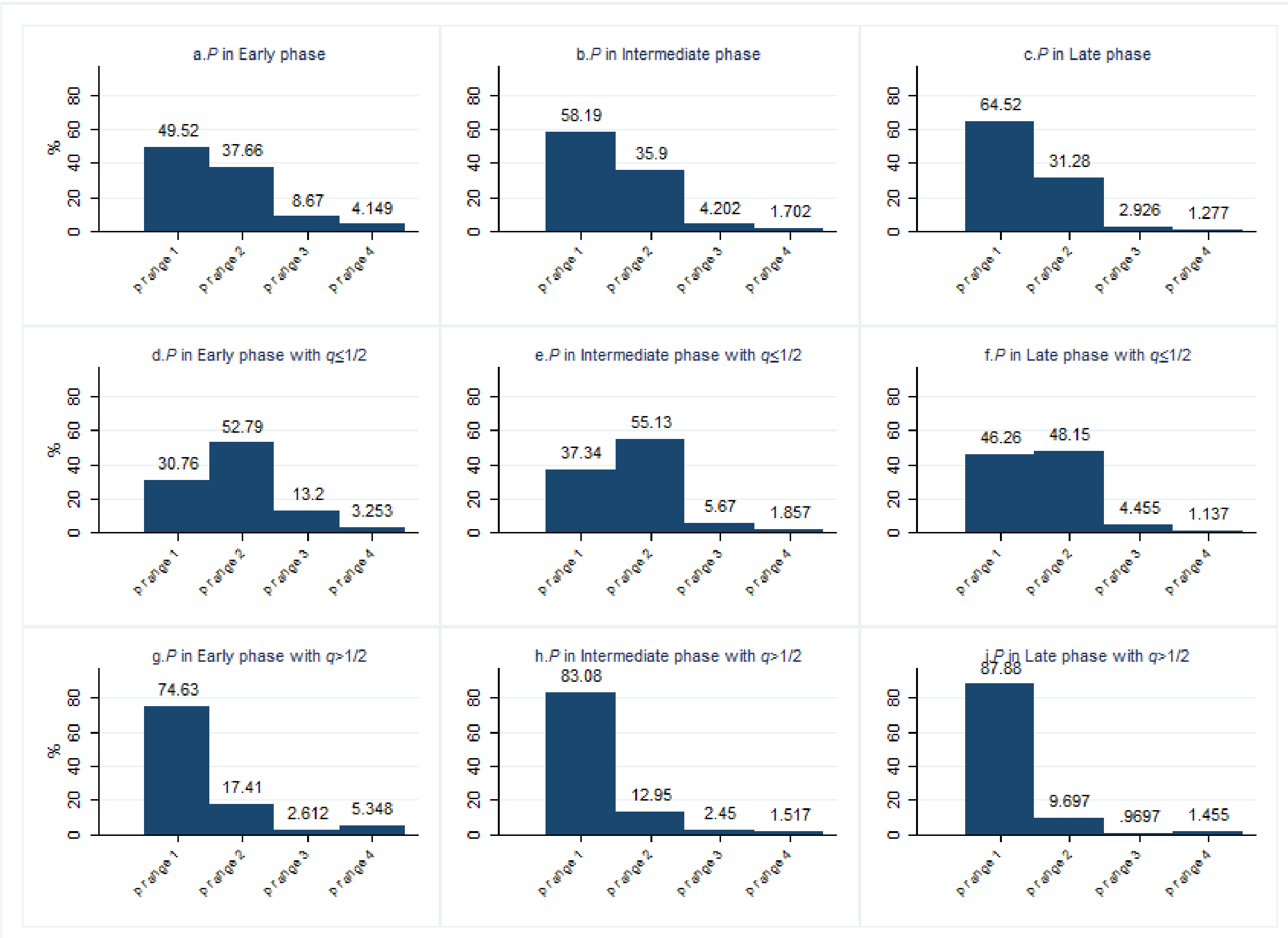
Price offers partly express how buyers want to share the surplus from trade and partly reveal suspicion regarding the value message received. For instance, price offers when $q\hat{v} < p < \hat{v}$ could reveal trust in the value message. Moreover, when $\hat{v}(v) = v$, offering $p = \frac{(1+q)}{2}\hat{v}$ would imply equal sharing offers higher (lower) than $\frac{(1+q)}{2}\hat{v}$ and would let sellers (buyers) gain more (see Figure 3). As is evident, price offers $p \leq q\hat{v}$ clearly reveal suspicion: since truth-telling sellers would reject them, buyers should propose them only when expecting the message to overstate the value of the firm.[8]

Figure 4 shows the distribution of price offers by phase and range of q. There is substantial evidence that buyers are suspicious and demand higher surplus shares, which increases over time. However, there are no relevant gender differences (Table 3).

Furthermore, ee use decision time to check for differences in the cognitive process of female and male participants. Decision time decreases for both female and male buyers and lapses for price offers for $p \leq q\hat{v}$, which are shorter than those with $p > q\hat{v}$. Decision lapses

[8]Except for noise, we do not expect buyers to offer $p \geq \hat{v}$.

Figure 4: Price offers by phase and by level of q



Notes:*p range 1*: $p \leq q\hat{v}$, *p range 2*: $\frac{(1+q)}{2}\hat{v} > p > q\hat{v}$, *p range 3*: $\frac{(1+q)\hat{v}}{2} \leq p < \hat{v}$, *p range 4*: $p > \hat{v}$.

for offers in the range $(q\hat{v}, \hat{v})$ are longer, which suggests that buyers try to balance that which both trade partners gain. Interestingly, male buyers need more time when demanding more for themselves, i.e., when offering $p > \frac{(1+q)\hat{v}}{2}$ whereas female buyers need more time when demanding less for themselves (see Appendix A, Table 12).

Result 2. *Buyers become more suspicious with experience and more frequently offer prices lower than $q\hat{v}$ which a truth-telling seller should find unacceptable.*

Table 3: Probability of price offers

	Early phase[†]			Intermediate phase[†]			Late phase[†]			All rounds[†]			Ttests: Early-Late[⋆]		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq q\hat{v}$	49.47	49.57	49.52	58.72	57.66	58.19	64.89	64.15	64.52	57.7	57.13	57.41	(0.00)	(0.00)	(0.00)
	(0.96)			(0.64)			(0.74)			(0.67)					
$q\hat{v} < p < \frac{(1+q)\hat{v}}{2}$	36.81	38.51	37.66	36.06	35.74	35.9	30.74	31.81	31.28	34.54	35.35	34.95	(0.01)	(0.00)	(0.00)
	(0.45)			(0.89)			(0.62)			(0.52)					
$\frac{(1+q)\hat{v}}{2} \leq p < \hat{v}$	9.68	7.66	8.67	3.94	4.47	4.2	3.09	2.77	2.93	5.57	4.96	5.27	(0.00)	(0.00)	(0.00)
	(0.12)			(0.57)			(0.68)			(0.31)					
$p \geq \hat{v}$	4.04	4.26	4.15	1.28	2.13	1.7	1.28	1.28	1.28	2.2	2.55	2.38	(0.00)	(0.00)	(0.00)
	(0.82)			(0.15)			(1.00)			(0.38)					

[†] Test for difference in means by gender within stage are reported in parenthesis (P-values).

[⋆] Test for difference in means between early and late phase for males, females and pooled observations.

4.3. Value messages and "Make Up"

Buyers make up, i.e., choose $\hat{v} > v$ in most cases, even though there is significant evidence of truth-telling and surprisingly strong evidence of understating. Table 4 shows that 71% of value messages overstate the value of the firm, 12% understate it, while 16% are truthful. As depicted, the share of understating value messages decreases across phases, whereas the shares of overstating and truth-telling value messages remain rather stable across time.

Moreover, male sellers are generally more sincere than females sellers: the share of true messages by male sellers increases across rounds, reaching in the last phase the 20% of their messages, while the share of true messages sent by female sellers remains fairly stable (16% in the last phase). Decision time shows a strong experience effect: it steadily decreases across phases. As expected, truth-telling is faster than strategizing, with male sellers thinking longer than female ones when overstating (see Table 13 in Appendix A).

If truth-telling is due to ethical obligations, one should expect the same seller participants to mainly choose $\hat{v}(v) = v$. Otherwise, truth-telling could be due to the occasional investing in the informativeness of value message $\hat{v}$.[9] The transition matrix in Table 5 reports relative frequencies of seller participants who are truth-telling $i = 0; 1; 2; 3; 4; 5$ or more times, respectively, in one phase and truth-telling $j = 0; 1; 2; 3; 4; 5$ or more times in the following phase.[10] Except for those, who never tell the truth, and those who do it at least five times,

[9]In Figure 5 we report the frequencies of truth-telling by phase and by gender.

[10]For instance, half of the 66 seller participants who never told the truth in the intermediate phase also

Table 4: Value messages: truth-telling, overstating and understating

	Early phase†			Intermediate phase†			Late phase†			All rounds†			Ttests: Early-Late⋆		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
truth-telling ($\hat{v} = v$)	15.95	15.10	15.53	14.46	16.70	15.53	15.95	19.14	17.55	15.46	16.98	16.22	(1.00)	(0.02)	(0.10)
	(0.61)			(0.18)			(0.07)			(0.12)					
overstating ($\hat{v} > v$)	66.81	72.77	69.79	72.87	72.02	72.45	72.55	71.60	72.07	70.74	72.13	71.44	(0.01)	(0.57)	(0.12)
	(0.00)			(0.68)			(0.64)			(0.25)					
understating ($\hat{v} < v$)	17.23	12.13	14.68	12.66	11.28	11.97	11.49	9.26	10.37	13.79	10.89	12.34	(0.00)	(0.04)	(0.00)
	(0.00)			(0.36)			(0.11)			(0.00)					

† Test for difference in means by gender within stage are reported in parenthesis (P-values).

⋆ Test for difference in means between early and late phase for males, females and pooled observations.

Table 5: Transition matrix of truth-telling

Times of truthtelling in phase E (in rows)†	**Times of truthtelling in phase I (in columns)**					
	0	**1**	**2**	**3**	**4**	**5+**
0 (65)	**0.508**	0.277	0.154	0.062	0.000	0.000
1 (59)	0.322	**0.271**	0.339	0.034	0.017	0.017
2 (27)	0.296	0.259	**0.259**	0.111	0.037	0.037
3 (17)	0.235	0.353	0.235	**0.059**	0.000	0.118
4 (7)	0.000	0.429	0.286	0.000	**0.000**	0.286
5+ (13)	0.154	0.000	0.000	0.154	0.154	**0.538**
Times of truthtelling in phase I (in rows)†	**Times of truthtelling in phase L (in columns)**					
	0	**1**	**2**	**3**	**4**	**5+**
0 (66)	**0.500**	0.303	0.121	0.061	0.000	0.015
1 (50)	0.320	**0.400**	0.140	0.080	0.040	0.020
2 (43)	0.326	0.163	**0.326**	0.093	0.047	0.047
3 (12)	0.083	0.167	0.167	**0.167**	0.083	0.333
4 (4)	0.000	0.250	0.250	0.000	**0.000**	0.500
5+ (13)	0.000	0.000	0.077	0.077	0.077	**0.769**

† In brackets number of sellers telling the truth $(0, 1, ..., 5+)$ times.

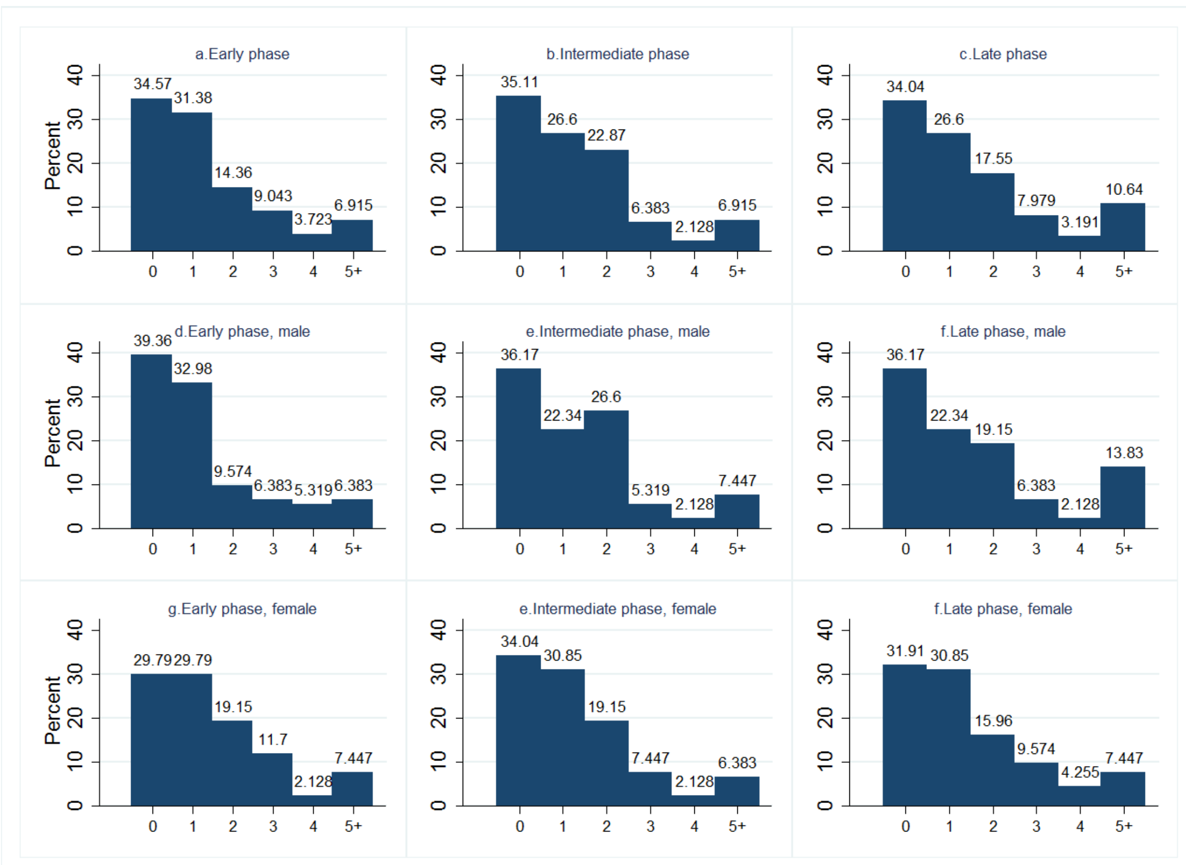
there is not much consistency in sellers' attitude across phases: seller participants are either seriously restricted by ethical concerns, or not at all, or just occasionally investing in the informativeness of value messages $\hat{v}$.

Result 3. *The majority of value messages overstate with this share remaining constant across phases. There is significant and persistent evidence of truth-telling. Surprisingly, understating is non-negligible but decreases across phases. The probability of truth-telling does not decrease across phases and is even largest (17.55%) in the last phase.*

---

never told the truth in the late phase.

Figure 5: Frequencies of truth-telling by phase and by gender



4.4. Winner's curse

Do buyer participants suffer from a "generalized" winner's curse which in turn offer non-optimal prices, thus earning less than predicted? Figure 6 reports the difference between predicted earnings and actual earnings, by level of q and by experience. Figure 6 illustrates the difference between the optimal price offer and the actual price offer, by level of q and of experience.[11] According to Figure 6(a) for q lower than 0.5 and higher than 0.6 optimal earnings exceed the actual ones. Figure 6(b) provides an explanation: in the interval $0.1 < q < 0.5$ price offers which are too low often exclude trade for which the accepted optimal price $p = q$ would have implied a positive expected profit for the buyer. On the contrary, for $q > 0.5$, positive price offers partly induce sellers to accept them which, however, implies negative expected profits for the buyer. Thus we confirm a winner's curse, which becomes less severe across phases (Figure 6), especially for extreme values of q.

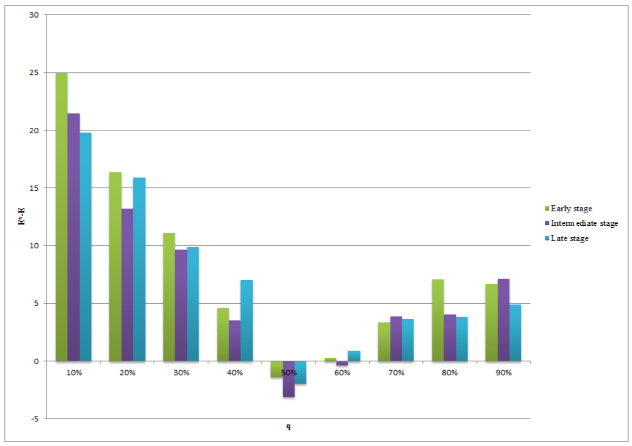
Also the difference between the optimal and the actual price is monotonically decreasing with experience (from the early to the late phase) for all levels of q: it seems that with more experienced, buyers learn to avoid the winner's curse. Moreover, the effect on buyer profits is weaker since it depends on seller acceptance. In Table 14 (Appendix A) we separate the results by gender: no gender difference emerges from this table, i.e., male and female buyers similarly suffer from the winner's curse and learn to avoid it.

5. Regression analysis

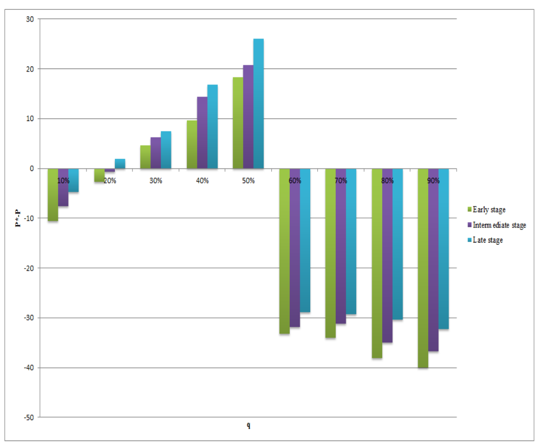
The following econometric analysis explores the determinants of acceptance, suspicion and "make up". Exploiting the longitudinal dimension of our dataset, we estimate panel regressions to account for the fact that participants play the Acquiring-a-Company game 30 times.[12]

[11] Recall that the optimal price offer is $p = q$ for $q \leqslant 0.5$ and $p = 0$ for $q > 0.5$, while expected earnings are $0.5 - q$ for $q \leqslant 0.5$ and zero for $q > 0.5$.

[12] We run panel regressions with random effects using the STATA command xtreg for suspicion and "make up" and xtprobit for acceptance. As a robustness check, we also estimate a dynamic panel data model



(a) Earning data for winner's curse



(b) Price data for winner's curse

(a) Difference between optimal and actual earning (pooled sample)
(b) Difference between optimal and actual price (pooled sample)

Figure 6: Winner's curse

5.1. Acceptance behavior

Table 6 reports the results of different model specifications for the pooled sample and for the gender sub-samples. Acceptance in round t is a function of value of the firm v, parameter q, price offer p, round t and acceptance decisions in the three rounds previous ($t-1$, $t-2$ and $t-3$). Moreover, we alternatively include the seller payoff in the previous round ($t-1$) or the suspicion manifested by the buyer in the previous round ($t-1$), i.e., the difference between the value message and the price offer in $t-1$.

In Table 6, columns 1 to 6 report the results for the pooled (column 1 and 2) as well as the sample separated by gender (columns 3 and 4 for female, 5 and 6 for male sellers). As expected, the value of the firm v and the parameter q are negatively and significantly associated with the probability of acceptance, with a larger price offer enhancing acceptance. Interestingly, the probability of acceptance does not vary across rounds, i.e., the coefficients of the variable t is not statistically significant (with the only exception of column 1).

Looking at the results by gender the association between previous acceptance and current acceptance holds only for $t-1$ with an opposite sign for female and male sellers whose significance, however is questioned when including previous payoff, respectively previous suspicion. In particular, when we include the previous payoff, acceptance in $t-1$ positively affects acceptance in round t by female sellers. On the contrary, when we include suspicion in $t-1$, acceptance in $t-1$ negatively affects acceptance in time t by male sellers. It seems that male sellers are more sensitive to previous gains than females when accepting or not.

In order to explore any potential gender constellation effect, we ran the same specifications, this time only with data retrieved from the treatments Embedded gender constellation and Gender, separately for female and male: the coefficient of the partner's gender is positive but not statistically significant, i.e., we do not confirm a gender constellation effect.

with xtabond2 which allows to fit the Arellano and Bover (1995) and Blundell and Bond (1998) estimators. The results obtained are qualitatively similar, even though xtreg and xtprobit are preferred with dataset characterized by large T (in our case, 30 rounds) and large N.

Table 6: Acceptance behavior

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All treatments						Treatment E and G			
	All	All	F	F	M	M	F	F	M	M
	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)
q	-0.06***	-0.06***	-0.05***	-0.05***	-0.06***	-0.06***	-0.05***	-0.05***	-0.06***	-0.06***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)
v	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.06***	-0.07***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
p	0.11***	0.11***	0.10***	0.10***	0.12***	0.12***	0.11***	0.11***	0.12***	0.12***
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
round	-0.01*	-0.00	-0.01	-0.01	-0.00	-0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
acceptance (lag1)	0.08	-0.02	0.19**	0.16	-0.05	-0.23**	0.28**	0.31***	-0.15	-0.30***
	(0.06)	(0.06)	(0.09)	(0.10)	(0.07)	(0.10)	(0.12)	(0.12)	(0.11)	(0.10)
acceptance (lag2)	0.02	0.02	0.02	0.02	0.01	0.01	0.00	0.00	0.08	0.09
	(0.06)	(0.05)	(0.08)	(0.09)	(0.08)	(0.07)	(0.09)	(0.09)	(0.11)	(0.09)
acceptance (lag3)	-0.05	-0.05	-0.01	-0.01	-0.11	-0.11	-0.03	-0.03	-0.18*	-0.18
	(0.06)	(0.07)	(0.09)	(0.07)	(0.08)	(0.09)	(0.10)	(0.09)	(0.11)	(0.12)
earning (lag1)	-0.00**		-0.00		-0.01**		0.00		-0.00	
	(0.00)		(0.00)		(0.00)		(0.00)		(0.00)	
suspicion (lag1)		-0.00		0.00		-0.00*		0.00		-0.00
		(0.00)		(0.00)		(0.00)		(0.00)		(0.00)
Male partner							0.16	0.16	0.09	0.09
							(0.11)	(0.11)	(0.09)	(0.07)
Constant	3.34***	3.40***	3.09***	3.07***	3.66***	3.84***	3.12***	3.10***	3.72***	3.93***
	(0.21)	(0.20)	(0.28)	(0.28)	(0.31)	(0.36)	(0.44)	(0.37)	(0.34)	(0.41)
Observations	5076	5076	2538	2538	2538	2538	1728	1728	1728	1728

Notes: Significance * 0.1, ** 0.05, *** 0.01.

5.2. Suspicion

Table 7 collects results on the dynamics of suspicion. Models 1 to 6 include data from all treatments controlling for parameter q, value message, round and the level of suspicion of the three lagged periods. Furthermore, we alternatively control for lagged earnings and lagged "make up". As expected, suspicion depends positively (and significantly) on $\hat{v}$ and negatively (and significantly) on q. The coefficient of round is positive and significant, i.e., suspicion increases through time. The coefficient of lagged earning is negative and significant, i.e., a larger payoff in the previous round induces buyers to be less suspicious. Furthermore, larger "make-up" of sellers in the previous round significantly increases buyer suspicion.

In columns 7 to 10 we check for gender constellation effects by considering the Embedded gender constellations treatment and the Gender treatment. Data for female (male) buyers are reported in columns 7 and 8 (9 and 10). When controlling for partner's gender, we find that the effect of lagged earning and lagged "make up" has the same sign, but is not significant anymore. On the other hand, female buyers interacting with male sellers tend to be more suspicious. To check whether this latter result is due to a specific gender constellation

Table 7: Suspicion

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All treatments						Treatment E and G			
	All	All	F	F	M	M	F	F	M	M
	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)
q	-0.19***	-0.19***	-0.21***	-0.21***	-0.18***	-0.18***	-0.22***	-0.22***	-0.18***	-0.18***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
$\hat{v}$	0.72***	0.72***	0.69***	0.69***	0.75***	0.75***	0.70***	0.70***	0.74***	0.74***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
round	0.13***	0.13***	0.13***	0.13***	0.13***	0.13***	0.14***	0.14***	0.11**	0.12**
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
Suspicion (Lag1)	0.15***	0.13***	0.16***	0.14***	0.14***	0.12***	0.14***	0.13***	0.14***	0.13***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Suspicion (Lag2)	0.13***	0.13***	0.12***	0.12***	0.13***	0.13***	0.12***	0.12***	0.14***	0.14***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Suspicion (Lag3)	0.11***	0.12***	0.10***	0.10***	0.12***	0.12***	0.09***	0.09***	0.13***	0.13***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Earning (Lag1)	-0.05***		-0.04**		-0.05***		-0.02		-0.03	
	(0.01)		(0.02)		(0.02)		(0.02)		(0.02)	
Make-up (Lag1)		0.02***		0.02**		0.02*		0.02		0.01
		(0.01)		(0.01)		(0.01)		(0.01)		(0.01)
Male partner							1.17*	1.18*	1.18	1.20
							(0.70)	(0.70)	(0.90)	(0.90)
Constant	-16.00***	-16.03***	-13.55***	-13.53***	-18.24***	-18.33***	-13.06***	-13.10***	-18.91***	-18.97***
	(1.53)	(1.53)	(2.03)	(2.04)	(2.22)	(2.21)	(2.52)	(2.53)	(2.67)	(2.64)
Observations	5076	5076	2538	2538	2538	2538	1728	1728	1728	1728

Notes: Significance * 0.1, ** 0.05, *** 0.01.

effect, we run a similar specification controlling for the partner's field of study (economics vs no-economics), with data from the Other Confound treatment (see Table 8) displaying the partner's field of study as statistically not significant. This altogether confirms an interesting gender constellation effect: (female) participants find the information about the partner's gender relevant, and this effect is persistent across rounds.

As an additional check, we estimated the initial specification using data only from the Other Confound treatment and Unknown treatment, where no information about the trading partner is disclosed, and found lagged earnings and lagged "make up" to be even more influential and significant (see Table 9). Thus conditioning on gender (constellation) seems to interact with path-dependence: male buyers are more influenced by own idiosyncratic past experiences than reacting to their partner's or own gender whereas female buyers persistently are more suspicious when encountering male sellers.

5.3. Make-Up

Table 10 collects results on the dynamics of "make up". Models 1 to 6 include data from all treatments controlling for parameter q, value of the firm, round and lagged level of "make

Table 8: Suspicion

	(11)	(12)	(13)	(14)
	Treatment OC			
	F	F	M	M
	β/(se)	β/(se)	β/(se)	β/(se)
q	-0.18***	-0.18***	-0.18***	-0.18***
	(0.05)	(0.05)	(0.06)	(0.05)
$\hat{v}$	0.67***	0.67***	0.73***	0.73***
	(0.04)	(0.04)	(0.04)	(0.04)
round	0.14	0.15	0.11	0.11
	(0.11)	(0.11)	(0.08)	(0.09)
Suspicion (Lag1)	0.14***	0.12**	0.13**	0.09*
	(0.04)	(0.05)	(0.05)	(0.05)
Suspicion (Lag2)	0.12***	0.13***	0.07**	0.08**
	(0.03)	(0.03)	(0.04)	(0.04)
Suspicion (Lag3)	0.10**	0.10**	0.14***	0.13***
	(0.04)	(0.04)	(0.05)	(0.05)
Earning (Lag1)	-0.06*		-0.13**	
	(0.04)		(0.05)	
Make-up (Lag1)		0.03		0.07**
		(0.03)		(0.04)
Partner Study: Economics=1	2.92	3.10	0.65	0.75
	(2.00)	(2.08)	(1.80)	(1.68)
Constant	-14.16***	-14.46***	-15.63**	-15.90**
	(5.33)	(5.30)	(6.44)	(6.50)
Observations	432	432	432	432

Notes: Significance * 0.1, ** 0.05, *** 0.01.

Table 9: Suspicion

	(15)	(16)
	Treatment U & OC	
	All	All
	β/(se)	β/(se)
q	-0.18***	-0.18***
	(0.03)	(0.03)
$\hat{v}$	0.71***	0.71***
	(0.02)	(0.02)
round	0.14***	0.14***
	(0.05)	(0.05)
Suspicion (Lag1)	0.16***	0.13***
	(0.02)	(0.02)
Suspicion (Lag2)	0.12***	0.12***
	(0.02)	(0.02)
Suspicion (Lag3)	0.11***	0.12***
	(0.02)	(0.02)
Earning (Lag1)	-0.10***	
	(0.02)	
Make-up (Lag1)		0.04**
		(0.02)
Constant	-16.43***	-16.56***
	(2.69)	(2.69)
Observations	1620	1620

Notes: Significance * 0.1, ** 0.05, *** 0.01.

Table 10: Make-up

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All treatments						Treatment E and G			
	All	All	F	F	M	M	F	F	M	M
	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)	β/(se)
q	0.11***	0.11***	0.14***	0.14***	0.09***	0.08***	0.13***	0.13***	0.09***	0.09***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
v	-0.62***	-0.62***	-0.61***	-0.61***	-0.64***	-0.64***	-0.61***	-0.61***	-0.66***	-0.66***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
round	0.03	-0.02	0.06	-0.01	0.01	-0.03	0.04	-0.04	0.05	0.01
	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)	(0.05)	(0.05)	(0.04)	(0.04)
Make-up (Lag1)	0.19***	0.18***	0.22***	0.19***	0.16***	0.16***	0.25***	0.20***	0.18***	0.18***
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
Make-up (Lag2)	0.20***	0.18***	0.22***	0.19***	0.18***	0.17***	0.22***	0.18***	0.19***	0.17***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Make-up (Lag3)	0.16***	0.14***	0.15***	0.13***	0.17***	0.15***	0.15***	0.12***	0.16***	0.15***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Earning (Lag1)	0.01		-0.05		0.06*		-0.10**		0.08*	
	(0.02)		(0.03)		(0.03)		(0.04)		(0.04)	
Suspicion (Lag1)		0.14***		0.17***		0.10***		0.21***		0.10***
		(0.01)		(0.02)		(0.02)		(0.03)		(0.02)
Male partner							0.29	0.21	0.46	0.51
							(1.00)	(0.97)	(0.87)	(0.86)
Constant	34.01***	30.22***	30.69***	25.75***	37.16***	34.73***	31.31***	25.26***	36.76***	34.57***
	(2.12)	(2.12)	(3.08)	(3.02)	(2.84)	(2.84)	(3.67)	(3.54)	(3.53)	(3.52)
Observations	5076	5076	2538	2538	2538	2538	1728	1728	1728	1728

Notes: Significance * 0.1, ** 0.05, *** 0.01.

up" with up to three periods. Furthermore, we alternatively control for lagged earnings and lagged suspicion. As expected, the coefficients of q and v are positive, respectively negative, and highly significant. The round is never statistically significant, i.e., "make up" does not follow a clear path across rounds. However, there is persistence in cheating: the influence of lagged "make up" is positive and significant. Lagged suspicion is always positive and significant: sellers increase "make up" after having met a suspicious buyer. Interestingly, the coefficient of the payoff in the previous round is positive and significant for male sellers but negative for female sellers. To explore any potential gender constellation effect for acceptance and suspicion, we run the same specifications only with data from the treatments Embedded gender constellations and Gender, separately for female and male sellers without diagnosing any significant effect, i.e., the coefficient of the partner's gender is not statistically significant.[13]

[13] Using data from the Treatment Other Confound we also investigate potential effects of including the partner's field of study. We find that this variable does not have any effect with all our results being confirmed.

6. Conclusions

This study is a rather systematic attempt to account for possible effects of gender (constellation) in an easily understood (by participants) but nonetheless complex environment allowing for asymmetric information, truth-telling and deception, other regarding concerns in bargaining and conditioning on gender (constellation) as well as on another confound (field of study). Our experimental workhorse is the modified Acquiring-a-Company game (Samuelson and Bazerman, 1985), which allows the better informed seller to send a value message before the buyer's price offer. The main motivation here has been to explore how both, experience and gender (constellation) influence behavior of buyers and sellers. Rather than speculating about gender differences in individual learning, for which there exists no obvious hypotheses, we wanted to see which gender (constellation) and other behavioral effects survive extensive game playing experience and whether conditioning on gender constellation can evolve anew. We did not experimentally induce initial female handicap, e.g. by a lower parameter q of female than of male sellers. Such an initial handicap strongly has been prevailing in the field due to traditional labor division in most human societies.

Our findings demonstrate how conditioning on gender (constellation) is affected by game playing experience and past outcome and behavior. Furthermore, the main experience and gender (constellation) effects apply to suspicion, i.e., the pricing behavior in the light of the received values messages. Interestingly, sellers adapt more to past experiences, differing from buyers, who condition more on gender constellation.

Compared to our companion paper based on playing a single incentivized round of the Modified Acquiring-a-Company game, in recursive play by (random) strangers gender differences emerge across phases. Male and female participants learn to react differently both to past behavior and the gender of their trading partner.

Additionally there are other surprising results: the significantly positive share of underreporting and the persistence of truth telling messages whose reasons are "obsessive truthtelling" or "investing in the informativeness of value messages". And, more fundamentally, there is hardly any evidence of other regarding concerns suggesting that these are rather context dependent and likely to be crowed out in stochastic environments, especially those involving asymmetric information.

Our experimental workhorse allows for chance effects (the random value v), asymmetric information about v, bargaining whether to trade and, if so, how to share the gains from welfare enhancing trade, with buyer participants at risk of suffering from a winner's curse, and − due to our modification − also from deception (see Gneezy et al. (2013) for some experimental studies of deception). According to us, such a stylized complex decision environment can sooner or later crowd out or at least discourage attempts to condition decision making on gender (constellation), which may not prove when the cognitive load is less demanding. In any future research this could be tested by exploring experience and gender effects for simpler versions of our setup, e.g. by forcing seller participants to accept whatever price proposal, or by making deceptive costly.

From a theoretical perspective, it is shown − as predicted − that even extensive game playing experience does not imply convergence to equilibrium play, e.g. to price offers $p = q$ for $q \leqslant 0.5$ and $p = 0$ for $q > 0.5$. Nevertheless behavior is improved by experience: the winner's curse is more frequently avoided, with seller participants more frequently rejecting unprofitable price offers which, of course, excludes trade (although it is welfare enhancing).

From a theoretical perspective, it also might be interesting on how the recursive play of the Modified Acquiring-a-Company game would evolve if participants are constantly paired up with the same participant in the other role. Would seller participants initially signal the truth and switch to "making up"only when approaching the last round? Would buyer participants initially believe in the truth of $\hat{v}$ and suggest prices which share $(1-q)\hat{v}$ equally? These are interesting research questions indeed. However, in our view, such a scenario does not seem very realistic: when successively bargaining over takeovers this will hardly ever be done by the same parties.

References

Akerlof, G.A., (1970). “The Market for “Lemons”: Quality Uncertainty and the Market Mechanism”, The Quarterly Journal of Economics, 84(3), 488-500.

Arelleno, M., and Bover, O. (1995). “Another Look at instrumental variable estimation of error component models”, Journal of Econometrics, 68(1), 29-51.

Blundell, R., and Bond, S. (1998). “Initial conditions and moment restrictions in dynamic panel data models”, Journal of econometrics, 87(1), 115-143.

Camerer, C.F., (2003). *Behavioral Game Theory: Experiments on Strategic Interaction*, Princeton University Press, Princeton.

Casari, M., Ham, J. C., and Kagel, J. H. (2007). “Selection Bias, Demographic Effects, and Ability Effects in Common Value Auction Experiments”, The American Economic Review, 97(4), 1278.

Croson, R., and Gneezy, U. (2009). “Gender differences in preferences ”, Journal of Economic literature, 448-474.

Di Cagno, D., Galliera, A., Güth, W., Pace, N., and Panaccione, L. (2015). “Make-Up and Suspicion in bargaining with cheap talk: An experiment controlling for gender and gender constellation”, Theory and Decision, *forthcoming*.

Dittrich, D. A., Büchner, S., and Kulesz, M. M. (2015). “Dynamic repeated random dictatorship and gender discrimination ”, Journal of Behavioral and Experimental Economics, 55, 81-90.

Dreber, A., and Johannesson, M. (2008). “Gender differences in deception ”, Economics Letters, 99(1), 197-199.

Erat, S., and Gneezy, U. (2011). “White Lies”, Management Science, 8(4), 723-733.

Fischbacher, U. (2007). “z-Tree: Zurich toolbox for ready-made economic experiments”, Experimental Economics, 10(2), 171-178.

Gneezy, U., Rockenbach, B., and Serra-Garcia, M. (2013). “Measuring lying aversion”, Journal of Economic Behavior & Organization, 93, 293-300.

Greiner, B. (2004). “The online recruitment system ORSEE 2.0 - A guide for the organization of experiments in economics”, Working Paper Series in Economics 10, University of Cologne, Department of Economics.

Harsanyi, J.C. (1967-1968). “Games with Incomplete Information Played by Bayesian Players”, Management Science, 14, 159-182 (Part I), 320-334 (Part II), 486-502 (Part III).

Ham, J. C., and Kagel, J. H. (2006). “Gender effects in private value auctions ”, Economics Letters, 92(3), 375-382.

Houser, D., Vetter, S., and Winter, J. (2012). “Fairness and Cheating”, European Economic Review, 56 (8), 1645-1655.

Ortmann, A. and Tichy L. (1999).“Gender differences in the laboratory: evidence from prisoner’s dilemma games”, Journal of Economic Behavior and Organization, 39(3), 327-339.

Samuelson, W.F., Bazerman, M. H., (1985). “Negotiation under the winner’s curse”, in Smith, V. (ed.) Research in Experimental Economics, Vol. III.

Valley K.L., Moag, J., and Bazerman M.H. (1998). “’A matter of trust’: Effects of communication on the efficiency and distribution of outcomes”, Journal of Economic Behavior and Organization, 34, 211-238.

Valley K., Thompson, L., Gibbons, R., and Max H. Bazerman (1998). “How Communication Improves Efficiency in Bargaining Games”, Games and Economic Behavior, 38, 127-155.

Appendix A, Tables

Table 11: Time (seconds) for acceptance by p, q, experience and gender

	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq qv$	6.40	6.20	6.30	3.60	3.41	3.50	2.63	3.13	2.88	4.08	4.14	4.11	(0.00)	(0.00)	(0.00)
	(0.63)			(0.47)			(0.07)			(0.74)					
$v > p > qv$	7.34	6.85	7.10	5.00	4.66	4.83	3.75	3.47	3.60	5.44	5.01	5.22	(0.00)	(0.00)	(0.00)
	(0.27)			(0.38)			(0.44)			(0.08)					
$p \geq v$	6.68	5.82	6.23	3.94	4.18	4.05	3.19	2.54	2.87	4.76	4.40	4.58	(0.00)	(0.00)	(0.00)
	(0.16)			(0.54)			(0.09)			(0.23)					
By level of q: $q \leq 50$															
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq qv$	6.14	6.20	6.16	3.88	3.18	3.53	2.56	3.18	2.86	4.09	4.06	4.07	(0.00)	(0.00)	(0.00)
	(0.92)			(0.14)			(0.15)			(0.94)					
$v > p > qv$	7.45	7.02	7.24	4.74	4.62	4.68	3.86	3.53	3.69	5.40	5.08	5.24	(0.00)	(0.00)	(0.00)
	(0.39)			(0.76)			(0.41)			(0.24)					
$p \geq v$	7.19	5.41	6.27	3.10	3.96	3.53	2.39	2.14	2.26	4.57	4.07	4.32	(0.00)	(0.00)	(0.00)
	(0.09)			(0.11)			(0.53)			(0.32)					
By level of q: $q > 50$															
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq qv$	6.60	6.20	6.40	3.43	3.54	3.49	2.68	3.09	2.88	4.07	4.19	4.13	(0.00)	(0.00)	(0.00)
	(0.48)			(0.72)			(0.24)			(0.63)					
$v > p > qv$	6.86	5.92	6.44	6.20	4.89	5.54	3.09	3.21	3.16	5.63	4.64	5.13	(0.00)	(0.00)	(0.00)
	(0.35)			(0.26)			(0.86)			(0.09)					
$p \geq v$	6.20	6.21	6.21	4.52	4.36	4.44	3.81	2.89	3.38	4.92	4.69	4.81	(0.00)	(0.00)	(0.00)
	(0.99)			(0.77)			(0.12)			(0.54)					

Notes: P-values in parenthesis: we run tests both for static gender differences (above each observation) and dynamic differences across periods for male, female and pooled sample (last three columns on the right).

Table 12: Time (seconds) for price proposals by buyer participants, separately for phase and gender

	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq q\hat{v}$	11.35	11.88	11.61	8.21	8.62	8.41	6.62	6.65	6.63	8.52	8.84	8.68	(0.00)	(0.00)	(0.00)
	(0.33)			(0.30)			(0.93)			(0.23)					
$q\hat{v} < p < \frac{(1+q)\hat{v}}{2}$	14.03	12.83	13.42	10.51	9.28	9.90	7.81	7.81	7.81	10.97	10.13	10.55	(0.00)	(0.00)	(0.00)
	(0.08)			(0.07)			(1.00)			(0.03)					
$\frac{(1+q)\hat{v}}{2} \leq p < \hat{v}$	11.34	16.07	13.43	7.95	9.71	8.89	6.41	6.81	6.60	9.63	12.44	10.96	(0.00)	(0.00)	(0.00)
	(0.00)			(0.25)			(0.76)			(0.01)					
$p \geq \hat{v}$	14.92	11.60	13.22	8.17	11.60	10.31	9.17	11.58	10.38	12.50	11.60	12.01	(0.01)	(0.99)	(0.06)
	(0.02)			(0.25)			(0.34)			(0.45)					
By level of q: $q \leq 50$															
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq q\hat{v}$	11.24	11.71	11.47	8.03	7.40	7.70	6.07	6.32	6.20	8.20	8.09	8.15	(0.00)	(0.00)	(0.00)
	(0.61)			(0.30)			(0.61)			(0.77)					
$q\hat{v} < p < \frac{(1+q)\hat{v}}{2}$	13.33	12.62	12.97	10.25	9.09	9.66	7.57	7.77	7.68	10.54	9.87	10.20	(0.00)	(0.00)	(0.00)
	(0.31)			(0.12)			(0.72)			(0.10)					
$\frac{(1+q)\hat{v}}{2} \leq p < \hat{v}$	11.29	16.05	13.40	7.23	9.63	9.66	6.09	6.76	6.45	9.47	12.52	10.89	(0.00)	(0.00)	(0.00)
	(0.00)			(0.17)			(0.64)			(0.01)					
$p \geq \hat{v}$	15.16	12.25	13.83	6.00	9.67	8.32	6.40	14.43	11.08	11.68	11.80	11.74	(0.02)	(0.44)	(0.24)
	(0.23)			(0.26)			(0.02)			(0.95)					
By level of q: $q > 50$															
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$p \leq q\hat{v}$	11.41	11.96	11.69	8.30	9.35	8.80	6.96	6.88	6.92	8.70	9.29	8.99	(0.00)	(0.00)	(0.00)
	(0.42)			(0.05)			(0.88)			(0.08)					
$q\hat{v} < p < \frac{(1+q)\hat{v}}{2}$	17.21	13.61	15.23	11.69	10.37	11.11	8.98	8.16	8.66	12.93	11.52	12.26	(0.00)	(0.00)	(0.00)
	(0.08)			(0.41)			(0.59)			(0.21)					
$\frac{(1+q)\hat{v}}{2} \leq p < \hat{v}$	11.67	16.22	13.62	11.67	9.87	10.38	7.43	8.00	7.50	10.48	12.08	11.28	(0.05)	.	(0.02)
	(0.13)			(0.61)			.		(0.41)						
$p \geq \hat{v}$	14.68	11.17	12.72	11.20	14.50	13.23	11.20	14.50	13.23	13.32	11.41	12.28	(0.18)	(0.25)	(0.13)
	(0.06)			(0.55)			(0.55)			(0.25)					

Notes: P-values in parenthesis: we run tests both for static gender differences (above each observation) and dynamic differences across periods for male, female and pooled sample (last three columns on the right).

Table 13: Time for message by truthtelling, overstating and understating

	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$v = \hat{v}$	10.47	10.98	10.72	6.94	7.19	7.08	5.33	5.67	5.52	7.60	7.74	7.68	(0.00)	(0.00)	(0.00)
	(0.46)			(0.57)			(0.25)			(0.65)					
overstating value of v	11.18	11.60	11.40	7.75	7.93	7.84	6.19	6.30	6.24	8.30	8.30	8.46	(0.00)	(0.00)	(0.00)
	(0.17)			(0.45)			(0.60)			(0.04)					
understating value of v	13.31	12.67	13.05	8.38	8.68	8.52	6.38	6.63	6.49	9.88	9.58	9.75	(0.00)	(0.00)	(0.00)
	(0.43)			(0.63)			(0.63)			(0.51)					
	By level of q: $q \leq 50$														
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$v = \hat{v}$	9.70	10.86	10.27	6.58	7.10	6.86	5.27	5.88	5.59	7.19	7.81	7.51	(0.00)	(0.00)	(0.00)
	(0.17)			(0.37)			(0.13)			(0.12)					
overstating value of v	11.21	11.56	11.39	7.45	7.79	7.62	6.07	6.38	6.22	8.19	8.63	8.41	(0.00)	(0.00)	(0.00)
	(0.41)			(0.30)			(0.26)			(0.05)					
understating value of v	13.16	12.80	13.02	8.89	8.26	8.60	5.95	6.55	6.23	9.86	9.31	9.62	(0.00)	(0.00)	(0.00)
	(0.73)			(0.40)			(0.25)			(0.34)					
	By level of q: $q > 50$														
	Early stage			Intermediate stage			Late stage			All rounds			Ttests: Early-Late		
	F	M	Both	F	M	Both	F	M	Both	F	M	Both	F	M	Both
$v = \hat{v}$	11.52	11.16	11.35	7.40	7.30	7.35	5.43	5.41	5.42	8.17	7.66	7.90	(0.00)	(0.00)	(0.00)
	(0.76)			(0.88)			(0.95)			(0.32)					
overstating value of v	11.14	11.64	11.40	8.05	8.10	8.07	6.33	6.20	6.26	8.41	8.62	8.51	(0.00)	(0.00)	(0.00)
	(0.24)			(0.90)			(0.67)			(0.36)					
understating value of v	13.65	12.43	13.11	7.09	9.66	8.33	7.29	6.86	7.12	9.93	10.18	10.04	(0.00)	(0.00)	(0.00)
	(0.31)			(0.02)			(0.74)			(0.75)					

Notes: P-values in parenthesis: we run tests both for static gender differences (above each observation) and dynamic differences across periods for male, female and pooled sample (last three columns on the right).

Table 14: Winner's curse, measured by differences in earnings and prices

Difference between optimal earning and actual earning									
q levels	10%	20%	30%	40%	50%	60%	70%	80%	90%
All rounds	22.06	15.10	10.25	5.10	-2.11	0.26	3.60	4.91	6.23
Early stage	24.97	16.35	11.11	4.60	-1.39	0.26	3.34	7.05	6.65
Intermediate stage	21.44	13.19	9.68	3.52	-3.11	-0.35	3.84	4.06	7.14
Late stage	19.77	15.91	9.90	7.00	-1.98	0.90	3.63	3.79	4.89
t-test E versus L (P-value)	(**0.05**)	(0.86)	(0.52)	(0.21)	(0.70)	(0.64)	(0.81)	(**0.01**)	(0.17)
Difference between optimal price and actual price									
q levels	10%	20%	30%	40%	50%	60%	70%	80%	90%
All rounds	-7,64	-0,63	6,05	13,83	21,60	-31,33	-31,49	-34,42	-36,28
Early stage	-10,63	-2,77	4,59	9,68	18,27	-33,16	-33,99	-38,10	-39,94
Intermediate stage	-7,64	-0,62	6,19	14,37	20,78	-31,89	-31,21	-35,01	-36,80
Late stage	-4,71	1,90	7,41	16,77	26,09	-28,92	-29,23	-30,31	-32,31
t-test E versus L (P-value)	(**0.00**)	(**0.00**)	(**0.03**)	(**0.00**)	(**0.00**)	(**0.01**)	(**0.00**)	(**0.00**)	(**0.00**)

Notes: P-values in parenthesis: we run tests for dynamic differences across periods.

Appendix B, Instructions

Introduction

Welcome to our experiment!

During this experiment you will be asked to make several decisions and so will the other participants.

Please read the instructions carefully. Your decisions, as well as the decisions of the other participants will determine your earnings according to some rules, which will be shortly explained later. In addition to your earnings from your decisions over the course of the experiment, you will receive a participation fee of 10 euro. Besides this amount, you can earn more euro. However, there is also a possibility of losing part of the participation fee, as it will be explained in the next section of these instructions. *But do not worry: you will never be asked to pay with your own money, as your losses during the tasks will be covered by the participation fee*. The participation fee and any additional amount of money you will earn during the experiment will be paid individually immediately at the end of the experiment; no other participant will know how much you earned. All monetary amounts in the experiment will be computed in ECU (Experimental Currency Units). At the end of the experiment, all earned in ECUs will be converted into euro using the following exchange rate:

30 ECU= 1 euro

You will be making your decisions by clicking on appropriate buttons on the screen. All the participants are reading the same instructions and taking part in this experiment for the first time, as you are.

Please note that hereafter any form of communication between the participants is strictly prohibited. If you violate this rule, you will be excluded from the experiment with no payment. If you have any questions, please raise your hand. The experimenter will come to you and answer your questions individually.

Description of the Experiment

This experiment is fully computerized. This experiment consists of the following **four phases, each composed by a different number of rounds**: Phase I of 1 round, Phase II of 30 rounds, Phase III of 12 rounds, and Phase IV of 10 rounds. After completing Phase I, you will proceed to Phase II; after completing Phase II, you will proceed to Phase III; after completing Phase III you will proceed to Phase IV. You can earn money in each phase of the experiment.

At the beginning and at the end of the Experiment, you are asked to reply to a short questionnaire.

At the beginning of the Experiment, each participant is randomly assigned one of two possible roles. Half the participants will be assigned the role of **Buyer**; the other half will be assigned the role of **Seller**. You will remain in the same role you have been assigned throughout the experiment.

In each of Phase I, II and III and in each of their rounds you will be matched with a different participant randomly assigned to you. In Phase IV you will decide individually and independently of your role.

Description of the Task – Phase I

In Phase I selling of a firm between a Seller, who owns the firm, and Buyer can take place. You will be told if you are Buyer or Seller, and will be matched with one of the other participant in the other role. For example, if you are selected as Buyer, then you will be randomly and anonymously matched with another participant who is a Seller.

The computer will randomly select the value of the firm among the following values: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90 and 95 (all the values are equally likely). This value will be communicated only to the Seller. The Buyer will not learn the value of the firm selected randomly by the computer.

The Seller's evaluation of the firm is proportional to the value of the firm selected by the computer. This proportion will be randomly selected by the computer and can only take one of the following values: 10, 20, 30, 40, 50, 60, 70, 80 or 90 percent (all the values are equally likely). The Seller's evaluation is the value of the firm multiplied by the selected proportion. The proportion will be communicated to both, Buyer and Seller, whereas the value of the firm will be known only to the Seller. *Do not worry: the software will provide the information on the decision screen, depending on your role, Seller or Buyer*.

As an example, suppose that the computer selected a value of the firm equal to 90 and a proportion of 50 percent, so that the Seller's evaluation of the firm will be 45, corresponding to 50 percent of 90. *In this case, the Seller will find on the screen of the computer that the value of the firm is 90, the proportion is 50 percent and that the Seller's evaluation is 45*; *the Buyer will find on the screen only the proportion of 50 percent*. Another example: suppose that the computer selected a value of the firm equal to 90 and a proportion of 80 percent. In this case, the Seller's evaluation will be equal to 72, corresponding to 80 percent of 90. *In this case, the Seller will find on the screen of the computer that the value of the firm is 90, the proportion is 80 percent and that the Seller's evaluation is 72*; *the Buyer will find on the screen only the proportion of 80 percent*.

The Seller sends a value message to the Buyer about the value of the firm, which can be either true or false. Therefore, the value message is not necessarily equal to the firm value nor to the Seller's evaluation of the firm. The message consists of an integer value between 0 and 100.

After having received the message, the Buyer makes a take-it-or-leave-it offer to the Seller by proposing a price, an integer number between 0 and 100. When making this offer, the Buyer just knows the value message and by which proportion of the value the Seller evaluates the firm.

After having received the price offer of the Buyer, the Seller decides whether to accept it or not. If she accepts, the firm will be sold for the offered price to the Buyer. If she does not accept, no trade takes place. After the Seller has decided, the payoffs of Buyer and of Seller are calculated and individually communicated at the end of Phase I. These payoffs are calculated as explained below and they are paid to all participants at the end of the experiment.

Calculation of the payoff in Phase I

The payoff of the unique round in Phase I does not depend on the value message and is calculated as follows:

If the Seller has accepted the offered price, the payoffs are:

- The Buyer earns the difference between the value of the firm and the accepted price
- The Seller earns the difference between the accepted price and the Seller's evaluation of the firm

An example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offer a price equal to 40, and that the Seller accepts it. In this case, the Buyer earns 45 – 40 = 5, and the Seller earns 40 – 36 = 4.

Another example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offers a price equal to 55, and that the Seller accepts it. In this case, the Buyer earns 45 – 55 = - 10, and the Seller earns 55 – 36 = 19.

If the Seller does not accept the Buyer's offer, the payoffs are 0 for both Seller and Buyer.

Description of the Task – Phase II

In Phase II, you will face for 30 rounds the same situation as in Phase I. As in the previous Phase, in each of the rounds you will be matched with a different participant randomly assigned to you.

The same instructions as in Phase I apply to Phase II, also the calculation of the payoffs.

The payment from this Phase will consist of the payoff of **one of the 30 rounds randomly selected**. For example, if round number five is selected, your payment for Phase II will be the payoff you earned in that round.

<u>Calculation of the payoff in each round in Phase II</u>

The payoff of each round in Phase II does not depend on the value message and is calculated as follows:

If the Seller has accepted the offered price, the payoffs are:

- The Buyer earns the difference between the value of the firm and the accepted price
- The Seller earns the difference between the accepted price and the Seller's evaluation of the firm

An example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offer a price equal to 40, and that the Seller accepts it. In this case, the Buyer earns 45 – 40 = 5, and the Seller earns 40 – 36 = 4.

Another example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offers a price equal to 55, and that the Seller accepts it. In this case, the Buyer earns 45 – 55 = - 10, and the Seller earns 55 – 36 = 19.

If the Seller does not accept the Buyer's offer, the payoffs are 0 for both Seller and Buyer.

Description of the Task – Phase III

In Phase III, you will face for 12 rounds the same situation as in Phase I. As in the previous Phase, in each of the rounds you will be matched with a different participant randomly assigned to you.

The same instructions as in Phase I apply to Phase III.

At the beginning of the Phase you will be asked if you prefer to be paid on the basis of the payoff of **one of the 12 rounds randomly selected** *or* on the basis of **the average payoff of the 12 rounds**. On the basis of your choice, the computer will calculate your payoff for this Phase.

<u>Calculation of the payoff in each round in Phase III</u>

The payoff of each round in Phase II does not depend on the value message and is calculated as follows:

If the Seller has accepted the offered price, the payoffs are:

- The Buyer earns the difference between the value of the firm and the accepted price
- The Seller earns the difference between the accepted price and the Seller's evaluation of the firm

An example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offer a price equal to 40, and that the Seller accepts it. In this case, the Buyer earns 45 – 40 = 5, and the Seller earns 40 – 36 = 4.

Another example: suppose that the firm value is equal to 45 and that the proportion of the firm value is 80 percent, so that the Seller's evaluation of the firm is 36. Suppose the Buyer offers a price equal to 55, and that the Seller accepts it. In this case, the Buyer earns 45 – 55 = - 10, and the Seller earns 55 – 36 = 19.

If the Seller does not accept the Buyer's offer, the payoffs are 0 for both Seller and Buyer.

Description of the Task – Phase IV

Phase IV consists of 10 rounds; during this Phase you won't interact with other participants. During this Phase you are asked to choose between pairs of lotteries. In particular, in each round for each lottery pair you have to assess which one you would prefer to play.

At the end of the experiment, **one round** will be randomly selected for payment, and the computer will play on your screen the lottery that you have preferred in this round. The payment of Phase IV is given by the result of this lottery.

Your Final Payment

Your final payment will be displayed on the screen at the end of the experiment. It is determined as the sum of:

- Payoff from the unique round in Phase I (in euro)
- Payoff from one randomly selected round in Phase II (in euro)
- Payoff from EITHER one randomly selected round OR an average payment between 12 rounds from Phase III (in euro)
- Payoff from one randomly selected round in Phase IV (in euro)
- Participation fee.