Supplementary Appendix
Trust Me: Communication and Competition in a Psychological Game

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This document contains supporting material for the document "Trust Me: Communication and Competition in a Psychological Game," which herein we refer to as the "main document." Section 1 contains the derivation of informative equilibria in the two games with psychological payoffs: the game with competition between sellers and the game without such competition. Section 2 presents the instructions distributed to subjects in the No Competition treatment. These instructions were read out loud by the experimenter. Section 3 contains screenshots from the software depicting the feedback in both treatments with psychological payoffs. Section 4 discusses the belief elicitation procedure. Section 5 contains additional analysis of experimental data. Section 6 shows the rationale behind the slow adjustment of beliefs in markets with competition compared to the markets with no competition. Section 7 presents the calculations behind welfare decomposition results presented in the main body of the paper.

1 Theoretical Predictions

In this section, we characterize informative equilibria in the two games with psychological payoffs described in the main document. The main feature of these equilibria is the fact that trade occurs with a positive probability contrary to the no-trade pooling equilibrium outcome, which exists in both versions of the game with psychological payoffs and in the game with material payoffs only.

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1.1 The Game without Competition

The setup of the game is detailed in Section 2.2 of the main document. Congruent with the experimental setup we make the following restriction to the parameter space: $L > 16$, and look for Perfect Bayesian equilibria of this game that are in pure strategies, in which messages have their intended meaning such that sellers with the high-quality product send the message m_1.

Consider first the buyer whose disappointment sensitivity is ω and who received message m_i. Such a buyer will purchase the product when

$$10z^B(m_i) - \omega \cdot 10z^B(m_i) \cdot (1 - z^B(m_i)) \geq 5. \tag{1}$$

For all $\omega \in [0, 1]$ this condition simplifies to

$$z^B(m_i)(1 - \omega + \omega z^B(m_i)) \geq 1/2. \tag{2}$$

As the left-hand side of inequality (2) is increasing in $z^B(m_i)$, resolving indifference in favor of buying, there exists a threshold value $\bar{z}^B(m_i, \omega) \in \Re_+$ such that the buyer wants to buy if and only if $z^B(m_i) \geq \bar{z}^B(m_i, \omega)$. Moreover, the threshold $\bar{z}^B(m_i, \omega)$ is increasing in ω, so buyers who are more sensitive to disappointment are less inclined to buy.

Naturally, this also means that for a fixed buyer's belief, $z^B(m_i)$, there exists a threshold on the disappointment sensitivity $\bar{\omega}(m_i)$, such that all buyer types below this threshold would purchase the product, while all the buyers above the threshold would not purchase. This threshold is calculated by setting the inequality (1) to hold with equality and respecting the fact that $\omega \in [0, 1]$:

$$\bar{\omega}(m_i) = \begin{cases} \min\{\frac{2z^B(m_i) - 1}{2z^B(m_i)(1 - z^B(m_i))}, 1\} \text{ if } z^B(m_i) \geq \frac{1}{2} \\ 0 \qquad\qquad\qquad\qquad\qquad\qquad\quad \text{otherwise} \end{cases}. \tag{3}$$

Consider now a seller with a low-quality product that suffers from lying aversion, i.e., has a type (q_L, g, L) where $g \in \{0, G\}$. This seller prefers to tell the truth and send the message m_0 if and only if

$$\Pr(\text{Buy}|m_1) \cdot \left(21 - g \cdot 10z^S(m_1) \cdot \underbrace{\left(\frac{2z^B(m_1) - 1}{4z^B(m_1)\big(1 - z^B(m_1)\big)} \right)}_{\mathbb{E}[\omega|m_1, \text{Buy}]} - L \right) + \Pr(\text{Not Buy}|m_1) \cdot (5 - L) < 5, \tag{4}$$

where

$$\Pr[\text{Buy}|m_1] = \bar{\omega}(m_1) \leq 1.$$

Further, as the left-hand side of inequality (4) is decreasing in g, a sufficient condition for any lying averse seller to send the message m_0 is that $L > 16$, as assumed.[1]

[1] If guilt-averse and lying-averse seller never sent the message m_0, then all sellers would send the message m_1 and there would be a pooling equilibrium with no trade. Our parameter restrictions avoid us having to consider this case among others.

Given the above play, it follows that $1 > z^B(m_1) \geq 1 - p > z^B(m_0) = 0$. As only the sellers of the low-quality product ever send the message m_0, and some sellers of the low-quality product send this message, $z^B(m_0) = 0$. As some low-quality sellers send the message m_1, $1 > z^B(m_1)$. Finally, as all high-quality sellers send the message m_1, $z^B(m_1) \geq 1 - p$. We call perfect Bayesian equilibria with these properties **Partially Informative Equilibria (PIE)**. Trivially, as Bayes rule pins down all beliefs and there are no off-path beliefs that need to be taken care of, PIEs are also sequential equilibria.

As $z^B(m_0) = 0$, if in equilibrium there is some trade it must occur when the buyer receives the message m_1. So, in any equilibrium that supports trade, and hence in any PIE, the seller of the low-quality product with no guilt or lying aversion strictly prefers to send the message m_1, and must do so.

So far we have pinned down the strategies of all seller types except $(q_L, G, 0)$. There are two possibilities: either type $(q_L, G, 0)$ sends message m_1 or message m_0. For the parameters implemented in our experiment, that is, $p = 0.6$, $G = 6$, and $L = 20$ (which satisfy our condition that $L > 16$), there exist two PIEs:

1. **PIE1.** The seller with types $(q_H, \cdot, \cdot)$, $(q_L, 0, 0)$ and $(q_L, G, 0)$ send message m_1. The remaining types of sellers send the message m_0. If the buyer receives the message m_0, then she knows it comes from a low-quality seller and does not purchase the product. If the buyer receives message m_1, then she interprets it as having a $z(m_1) = 0.57$ chance of coming from the high-quality seller. In this case, the buyer with the disappointment parameter $\omega \leq 0.29$ purchases the product. The buyer's expected payoff is 5.07 and the seller's expected payoff is 8.05.

2. **PIE2.** The seller with types $(q_H, \cdot, \cdot)$ and $(q_L, 0, 0)$ send message m_1. The remaining types of sellers send the message m_0. If the buyer receives the message m_0, then she knows it comes from a low-quality seller and does not purchase the product. If the buyer receives message m_1, then she interprets it as having a $z(m_1) = 0.73$ chance of coming from the high-quality seller. In this case, all types of buyers purchase the product. The buyer's expected payoff is 5.70 and the seller's expected payoff is 13.80.

The multiplicity of equilibria arises because guilt-averse sellers of low-quality products suffer a larger dis-utility from selling to more optimistic buyers. So when buyers don't expect this type to sell to them it is the best response for this type to not sell to them, but when these buyers do expect this type to sell to them it is the best response for this type to sell to them.

1.2 The Game with Competition

The setup of the game is detailed in Section 2.3 of the main document. In that game, there are two sellers and a buyer. A strategy for a seller is a mapping from his set of possible types into a probability distribution over messages. A strategy for the buyer is mapping from the set of possible types, and pairs of messages she might receive into a probability distribution over the two sellers (the selection) and a probability distribution over the binary choice of buying the product or not.

In this section, we look for Perfect Bayesian equilibria that support trade in the context of our experiment with parameters $p = 0.6$, $G = 6$, and $L = 20$, in which the buyer's purchasing decisions and the sellers' communication strategies are pure, messages have their intended meaning such that sellers with the high-quality product send the message m_1, and in which the buyer resolves indifference about which seller to select by flipping a coin. We focus on symmetric equilibria in which both sellers use the same communication strategy and, as before, refer to such equilibria as **Partially Informative Equilibria (PIE)**. Thus, the equilibrium consists of strategies for each seller and the buyer and the system of beliefs such that strategies of all players maximize their expected payoffs fixing the strategies of other players, and beliefs are updated according to Bayes' rule on path. In particular, each seller plays the communication strategy which is optimal given the other seller's communication strategy, the buyer's strategy, and the beliefs of this seller.

The optimal purchasing behavior of the buyer given message $m^{S^{\text{win}}}$ is derived similarly to the game without competition. A buyer with disappointment sensitivity ω who selects the seller with message $m^{S^{\text{win}}}$ will purchase the product from this seller if and only if

$$10z^B(m^{S^{\text{win}}}) - \omega \cdot 10z^B(m^{S^{\text{win}}}) \cdot (1 - z^B(m^{S^{\text{win}}})) \geq 5 \Leftrightarrow$$

$$\omega \leq \bar{\omega}(m^{S^{\text{win}}}) = \begin{cases} \min\{\dfrac{2z^B(m^{S^{\text{win}}}) - 1}{2z^B(m^{S^{\text{win}}})(1 - z^B(m^{S^{\text{win}}}))}, 1\} & \text{if } z^B(m^{S^{\text{win}}}) \geq \dfrac{1}{2} \\ 0 & \text{otherwise} \end{cases}.$$

The threshold value $\bar{\omega}(m^{S^{\text{win}}})$ is the highest disappointment sensitivity for which the buyer is willing to purchase the good.

In order for some trade to occur in equilibrium, it has to be the case that $z(m^{S^{\text{win}}}) \geq \frac{1}{2}$ at least for some $m^{S^{\text{win}}}$. Otherwise, all buyers regardless of their disappointment sensitivity would refrain from purchasing the product since $\bar{\omega}(m^{S^{\text{win}}}) < 0$ in this case.

Moreover, we look for partially informative equilibria in which all high-quality sellers send message m_1, which means two things. First, the message m_0 necessarily comes from a low-quality seller, i.e., $z(m_0) = 0$ and the trade can occur only when the message of the selected seller is $m^{S^{\text{win}}} = m_1$. Second, this puts a restriction on the fraction of low-quality sellers that can send message m_1 in equilibrium, that is,

$$z(m_1) = \frac{1 - p}{1 - p + p \cdot \psi} \geq \frac{1}{2} \Leftrightarrow \psi \leq \frac{1 - p}{p} = \frac{2}{3},$$

where ψ denotes the fraction of low-quality sellers that send message m_1. This restriction coupled with the distribution of sellers' types implies that ψ can only take three values: $\psi \in \{0, \frac{1}{4}, \frac{1}{2}\}$.[2] Thus, in any PIE, the highest ex-ante probability that a seller sends message m_1 is $1 - p + p \cdot \psi_{\max} = 1 - \frac{p}{2}$.

[2]In principle, in our model, ψ can take five values: $\psi \in \{0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\}$. However, the largest value of 1 is incompatible with PIE because in this case, all types of sellers pool together, send message m_1, and there will be no trade, since $p > \frac{1}{2}$. The second-highest value of $\frac{3}{4}$ is ruled out by $z(m_1) \geq \frac{1}{2}$ condition.

So far we have argued that in any PIE, we must have $0 = z(m_0) < \frac{1}{2} \leq z(m_1) < 1$.

Next, we will show that all low-quality sellers with positive lying aversion, i.e., $l^{S_j} = L > 0$, must report m_0 in equilibrium.

Consider the seller S_j with type (q_L, g^{S_j}, L) for $g^{S_j} \in \{0, G\}$ who faces the competition from the seller S_k. The seller S_j will choose to send m_0 over m_1 if and only if

$$\frac{1}{2}\Pr[m^{S_k} = m_0] \cdot 5 \geq$$

$$\left(\frac{1}{2}\Pr[m^{S_k} = m_1] + \Pr[m^{S_k} = m_0]\right) \cdot \left[\bar{\omega}(m_1) \cdot \left(21 - g^{S_j} \cdot 10 z^{S_j}(m_1) \cdot \frac{\bar{\omega}(m_1)}{2} - L\right) + (1 - \bar{\omega}(m_1)) \cdot (5 - L)\right]. \quad (5)$$

The right-hand side of the inequality (5) is decreasing in g^{S_j}, thus, if we can show that the seller S_j with type $(q_L, 0, L)$ prefers to send the message m_0, so would the seller S_j with type (q_L, G, L) since $G > 0$. The inequality (5) simplifies to

$$\frac{1}{2}\Pr[m^{S_k} = m_0] \cdot 5 \geq \left(\frac{1}{2}\Pr[m^{S_k} = m_1] + \Pr[m^{S_k} = m_0]\right) \cdot \left[\bar{\omega}(m_1) \cdot \left(21 - L\right) + (1 - \bar{\omega}(m_1)) \cdot (5 - L)\right] \quad (6)$$

for the seller S_j with type $(q_L, 0, L)$. When S_k sends message m_1 with probability μ, inequality (6) further simplifies to

$$\frac{5}{2}(1 - \mu) \geq \left(\frac{\mu}{2} + 1 - \mu\right) \cdot \left[\bar{\omega}(m_1) \cdot \left(21 - L\right) + (1 - \bar{\omega}(m_1)) \cdot (5 - L)\right] \Leftrightarrow$$

$$\bar{\omega}(m_1) \leq \frac{35 - 20\mu}{16(2 - \mu)}. \quad (7)$$

The right-hand side of inequality (7) is decreasing in μ. Thus, inequality (7) holds true for all value $\bar{\omega}(m_1) \in [0, 1]$ since the highest value of μ is equal to $1 - \frac{p}{2} = 0.7$.

Thus, all low-quality sellers who suffer from lying aversion report m_0 in a PIE.

The expected payoff of the buyer is increasing in $z^B(m_i)$, therefore, if the buyer observes two different messages he prefers to select the seller who sent message m_1, and if both messages are the same, then the buyer selects one seller randomly. Furthermore, just like in the game without competition, the low-quality seller with no guilt or lying aversions will prefer to pool with high-quality sellers and send message m_0 because if in equilibrium there will be some trade, it must occur when the buyer selects the seller with a message m_1.

The last step is to pin down the behavior of the seller with $(q_L, G, 0)$. As in the game without competition, for the parameters used in our experiment, there exist two PIEs:

1. **PIE1.** The sellers with types $(q_H, \cdot, \cdot)$, $(q_L, 0, 0)$ and $(q_L, G, 0)$ send message m_1. The remaining types send the m_0 message. If the buyer receives two different messages, then she selects the seller with message m_1. If the two messages are the same, then she selects a seller randomly. If the selected seller message is m_0, then the buyer knows it comes from a low-quality seller and does not purchase the product. If the selected seller message is m_1, then the buyer interprets it as having a $z(m_1) = 0.57$ chance of coming from the high-quality seller. In this case, the buyer with the disappointment parameter $\omega \leq 0.29$ purchases the product. The buyer's expected payoff is 5.09 while the sellers' expected payoffs are 3.65.

2. **PIE2.** The seller with types $(q_H, \cdot, \cdot)$ and $(q_L, 0, 0)$ send the m_1 message, while the remaining types send the m_0 message. If the buyer receives two different messages, then she selects the seller with message m_1. If the two messages are the same, then she selects a seller randomly. If the selected seller message is m_0, then the buyer knows it comes from a low-quality seller and does not purchase the product. If the selected seller message is m_1, then the buyer interprets it as having a $z(m_1) = 0.73$ chance of coming from the high-quality seller. In this case, all types of buyers purchase the product. The buyer's expected payoff is 6.02 and the sellers' expected payoffs are 5.69.

2 Instructions for No Competition treatment

General. Welcome to today's experiment. This is an experiment in decision making which will provide you an opportunity to earn money. You will participate in two unrelated tasks. The instruction for the first task is given below. The instruction for the second task will be given to you after you have completed task 1.

Instructions for Task 1. The amount of money you earn depends partly on your decisions, partly on the decisions of others, and partly on chance. Various research organizations have provided funds for this experiment and if you make good decisions you may be able to receive a good payment, which will be paid to you at the end of the session. Please do not talk to each other during the experiment and put away all of your electronic devices and shut off your cell phone during the experiment.

At the beginning of the experiment you will be randomly assigned one of the two roles: a buyer or a seller. Your role will remain fixed throughout the experiment.

The experiment consists of 10 blocks with several rounds within each block. Before the beginning of each block, you will be randomly matched with another participant in this room who was assigned a different role than you are. That is, if you are a buyer you will be matched with a seller, and if you are a seller you will be matched with a buyer. This matching remains fixed for the duration of the block. Once the block is over, you will be re-matched with another participant who was assigned a different role than you are, and so forth. Note, that it is impossible to track participants between blocks because of the random assignments, and you will not know the real identity of the participants you are matched with, either during or after the experiment.

The Buyer-Seller Game

In this experiment, each seller has a product that he wants to sell to the buyer. The product is either of low quality or of high quality. There is a 40% chance that the product has high quality and a 60% chance that it is low quality. The buyer prefers to buy the high quality product. Each seller can send a message to the buyer he is matched with to convince him to buy the product. The seller always knows the quality of his/her product but the buyer does not until s/he buys it. The buyer has to decide whether to buy it or not based on the message s/he receives and the additional details as described below.

The seller can send one of the two messages to the buyer:

Message m1 is "The product is really of high quality"

Message m0 is "The product is of low quality"

It is up to the seller whether he wants to lie and misrepresent the quality of the product or not. However, if the seller lies about the quality of the commodity he will incur a cost L that will reduce his payoff in the experiment. Further, if the seller lies and convinces the buyer to buy the low quality product s/he may incur additional penalty G for misleading the buyer, which will depend on how disappointed the buyer will be about ending up with a low quality product. We will talk about buyers' sensitivity to disappointment later. The seller's cost of lying (L) and the penalty for misleading (G) can be different for each seller. He might incur no cost of lying or high costs from lying. Similarly, he might pay no penalty for misleading the buyer or a high penalty for misleading the buyer. In the experiment, the seller can be one of the four types:

Type S1 - ($L = 0$, $G = 0$)

Type S2 - ($L = 0$, $G = 6$)

Type S3 - ($L = 20$, $G = 0$)

Type S4 - ($L = 20$, $G = 6$)

There is a 25% chance that the seller is one of these four types. Note that some sellers will incur no costs from lying or misleading (the $L = 0$, $G = 0$ types) while others will pay a high cost from lying and misleading (the $L = 20$, $G = 6$ types). Some are going to be of mixed types and will not incur costs from lying but will pay the penalty for misleading ($L = 0$, $G = 6$); some will pay a cost for lying but will not incur an additional penalty from misleading ($L = 20$, $G = 0$).

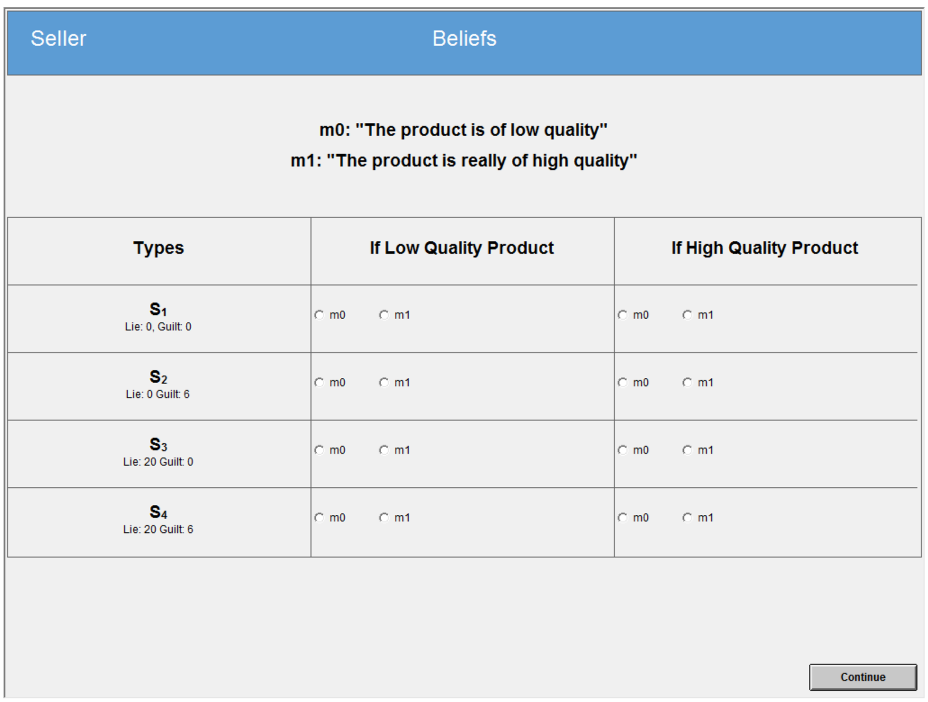
The buyers differ in their sensitivity to being disappointed. Disappointment comes from being misled by the seller into buying a low quality product while expecting it to be a high quality. For example, if the seller with a low quality product sends the message "the product is really of high quality" and the buyer buys the product believing the lie only to find out its actually low quality, then the buyer's payoff will go down due to his disappointment. By how much the payoff will go down depends on the buyer's "disappointment sensitivity" parameter D, which can take a value between 0 and 1 with equal likelihood. That is, a value 0.16 is as likely to occur as a value 0.79 or any other value between 0 and 1 inclusive. Hence a buyer is as likely to be very sensitive to disappointment and have a high value for D, as he is to be very *little sensitive* and have low values for D. Only the buyer will know the true sensitivity value.

What happens in each block. Each block consists of 10 rounds of play between a buyer and a seller. Remember, that buyers and sellers are randomly matched for the duration of a block, and re-matched once the block is over.

At the beginning of each block, a buyer and a seller will specify their strategies, which will be used to play 10 repetitions of the game. We will call these repetitions rounds. For each round, the computer will randomly select the disappointment parameter for the buyer, D, which takes values between 0 and 1 with each number being equally likely. In addition, for each round, the computer also randomly selects the quality of the product for the seller (40% chance of high quality and 60% chance of low quality) as well as seller's lying and misleading parameters L and G (each of the four types S1, S2, S3, and S4 are equally likely to be selected for both high and low quality products).

The Task of the Seller

If you were assigned the role of a seller, then at the beginning of each block, you will have to decide the message you want to send to the buyer for each of the two types of products and each combinations of lying and misleading parameters L and G that you might be assigned. Specifically, you will be asked to fill out the following table:



Seller Beliefs

m0: "The product is of low quality"
m1: "The product is really of high quality"

Types	If Low Quality Product	If High Quality Product
S_1 Lie: 0, Guilt: 0	m0 m1	m0 m1
S_2 Lie: 0 Guilt: 6	m0 m1	m0 m1
S_3 Lie: 20 Guilt: 0	m0 m1	m0 m1
S_4 Lie: 20 Guilt: 6	m0 m1	m0 m1

Continue

In this table, each cell in columns 2 and 3 represents the combination of the quality of the product you might have and lying and misleading parameters L and G. For each cell in this table, you have to choose which of the two messages (m0 or m1) you will send to the buyer. For instance, on the top right of the table is the situation in which you are of type S1 and you have a high quality product to sell. Your task is to decide which message you want to send to the buyer in this situation: message m1 = "The product is really of high quality" or message m0 = "The product is of low quality". You will be prompted to make such a choice in each of the 8 situations in the table above.

Once you have entered all your choices at the beginning of a block, the computer will play out your specified strategies for you over the 10 rounds in that block. So the computer will first assign a high quality or a low quality product to you with high quality product occurring with 40% chance. Then, the computer will assign you one of the four types S1, S2, S3, and S4 with a 25% chance in each round. And then the computer will send message to the buyer, which you have specified for this type and this product quality in the table above. Once the next round starts, the computer will select product quality and your type again, and use message you specified for that type, and so on.

Guesses about buyers:

In addition to the strategies you choose in each block, you will be asked to specify your guess about the buyer's behavior before the start of each block. In particular, you will be asked to give your best guess about how credible the buyer thinks your message about the quality of the product is, for each message s/he receives from you. In other words, you need to specify what you think the buyer thinks about the chance of receiving a high quality product, after receiving either of the messages from you. We will also ask buyers to specify what they think about the chance of the product being high quality based on the message they receive from you.

The Task of the Buyer

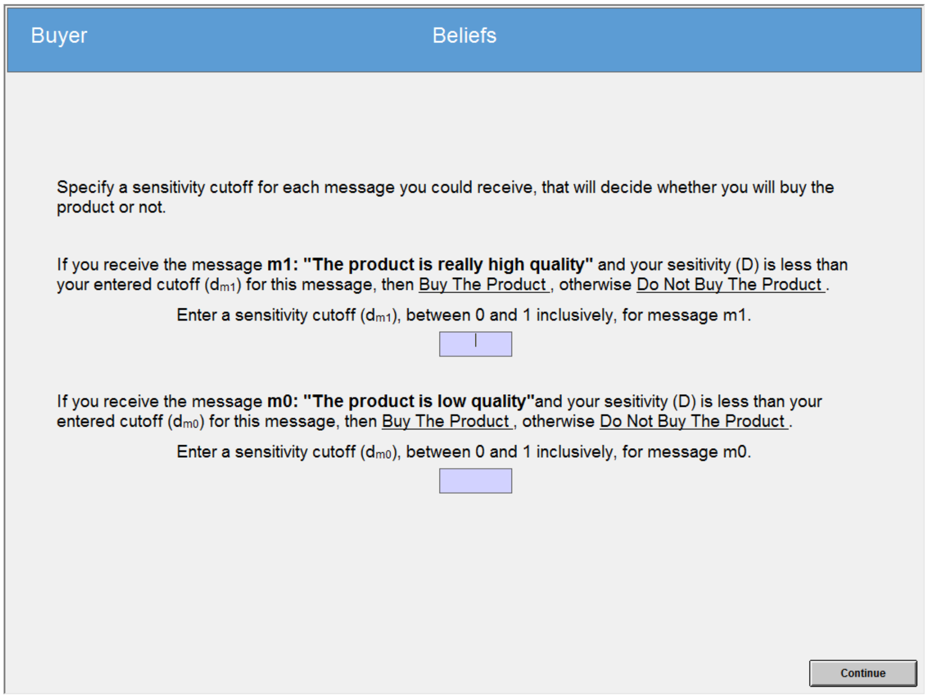
If you are assigned the role of a buyer, you have to provide your buying strategy for each round, based on the messages you will receive from the seller, and your sensitivity to disappointment in case seller misguides you to buy a low quality product. Remember that sensitivity to disappointment is measured by a fraction between 0 and 1 determined by the computer with equal chances. Note that the smaller the sensitivity parameter D, the less your loss in payoff in case you end up buying the low quality product believing it to be of a high quality.

You will be asked to provide two cutoff values of the sensitivity parameter; one in the case you receive the message m0, and one in the case you receive the message m1. The computer will use these two cutoff values to decide whether you end up buying the product or not. Specifically, say you receive the message "the product is really of high quality". Then, if the computer draws a sensitivity parameter lower than your specified high cutoff, then you will buy the product. On the other hand, you will not buy the product if the computer draws a sensitivity number higher than your high cutoff. Similarly, say you receive the message "the product is of low quality." Then, if the computer draws a sensitivity number lower than your specified low cutoff, then you will buy the product, while you will not buy the product if the computer draws a sensitivity number higher than your low cutoff.

The Buyer's screen will look as follows:

Guesses about sellers:

In addition to the choices you make in each block, you will need to specify your guesses about the seller's behavior before the start of each block. In particular, you have to guess the probability that the seller matched with you is likely to have a high quality product



when he sends you the message m1 = "the product is really of high quality" as well as when he sends you the message m0 = "the product is of low quality". In other words, you have to specify two probability numbers (each between 0 and 100): one representing the guess that if you receive the message "The product is really of high quality" then the product is actually of high quality and another if you receive a message "The product is of low quality" then the product is still of high quality.

Payoff Determination in the Experiment

We will determine your final payoff in the experiment as follows. First, we will calculate the payoff you received from reporting your guesses in each block as described below. Next, we will determine your payoff from playing the game in each block of the experiment as described below. We will then choose a block at random first, and then for each of the 10 rounds in that block pay with equal chances either the amount of money you earned by reporting your guesses or by playing the game over. In other words, in a chosen block you have equal chances of getting your belief payoff or your game payoff for each of the 10 rounds.

Finally, note that in the experiment both for your guessing task and for the game you will be paid in a currency called Experimental Currency Units or ECUs. At the end of the experiment we will convert your ECU payment into US dollars at the rate of 1 ECU = \$0.06 if you are a Buyer and at the rate of 1 ECU = \$0.008 if you are a Seller.

Payoff Calculation for Guesses

We will pay you for the guesses you enter in the computer in a manner that gives you a large incentive to report your true guesses. We will do this by giving you a fixed amount of money, which is yours to keep, but from which we will subtract an amount of money that will depend on how inaccurate your guesses are. Suppose you are a seller and you need to guess how likely it is that the buyer will buy the product expecting it to be of high quality when she receives the message "the product is really of high quality." Note, the buyer will either buy the product or not when the round is played out and we will know the outcome with probability 100%. If you (seller) reported that there was only a 60% probability that the buyer buys it facing the specified message, then you will be making a mistake of 40% in correctly predicting the buyer's behavior, and in the formula we use to pay you for your guesses, we will penalize you for that mistake by taking that 40%, squaring it, and multiplying it by a constant and subtracting that amount from your fixed payment. The same is true for the mistake you make by placing a positive probability on the chance that the Buyer will buy if in fact he did not.

The exact formula we will use to pay you is available for you to inspect and we will hand you an explanation of it if you request it after the experiment. For the sake of brevity, we will not explain it further here. However, there are two important things for you to understand about how we pay you for your beliefs:

1. First, if your objective is to maximize the amount of money you are paid in the experiment then a good way to do that is to enter your true beliefs into the computer when asked. In other words, one can seldom do better than reporting beliefs truthfully in the game.
2. Second, as we will describe below, in addition to paying you for your reported guesses, we will also pay you for how you play the buyer-seller game. As you will see there the guesses you report will also affect your payoffs in the game. **We have set the payoffs you receive to be such that if you want to maximize the money payoff you receive in the entire experiment it will be best again for you to report your guesses truthfully and the play the game using these reported guesses.** In other words, it will not benefit you to report false guesses purposefully if you feel that will increase your payoffs in the game. This fact is reinforced by the fact that when we pay you we will flip a coin and with probability $\frac{1}{2}$ pay you either for the guesses you report or the payoffs you receive in the game. This makes it even more imperative that your report your beliefs truthfully.

Payoff Calculation For the Buyer-Seller Game

In order to explain your payoffs in the Buyer-Seller game, consider the following two simple figures.

These figures describe how your payoffs are determined depending on the message sent by the Seller, whether the product is of high or low quality, and whether the Buyer decides to buy or not. At the bottom of the figure are the payoffs to the Buyer and Seller with the Buyer's payoff listed first and the Seller's listed second.

Let us start with Figure 1 on the left. This figure describes the payoffs in the Buyer-Seller game when the Seller sends the message m0 indicating that "The product is of low quality".

Figure 1: Payoffs when message m0 is sent

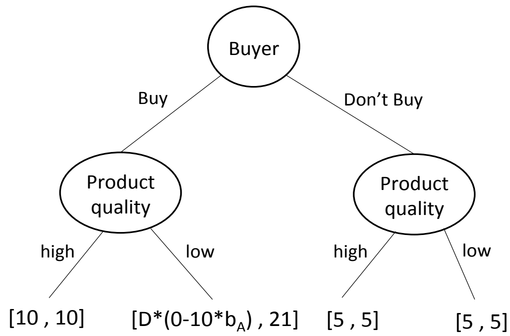
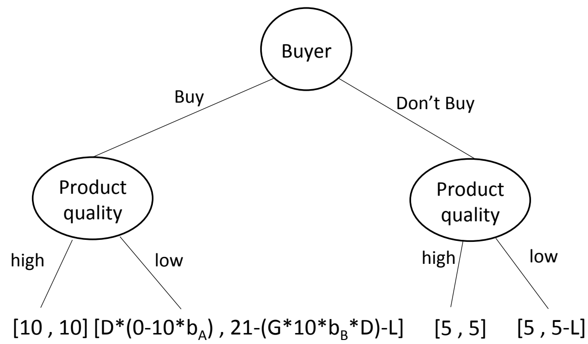


Figure 2: Payoffs when message m1 is sent



Given this message, if the Buyer decides not to buy, then no matter whether the product is high quality or not both the Buyer and the Seller will receive a payoff of 5. However, if after being told the good is of low quality the Buyer decides to buy, then everyone's payoff will depend on whether the product is actually of low or high quality. If it is of low quality, the Buyer will get a payoff of $D \cdot (0 - 10 \cdot bA)$ and the Seller will get a payoff of 21 (he got rid of a low quality product).

Let's talk about the Buyers payoff first $D \cdot (0 - 10 \cdot bA)$. This payoff indicates that the Buyer is disappointed since, given his belief that the good would be of high quality, bA, he expected to get a payoff of $10 \cdot bA$, (i.e., he expected to get a payoff of 10 with a probability bA and hence his expected payoff is $10 \cdot bA$). Since the good was actually of low quality, his payoff was 0 and so his disappointment was $(0 - 10 \cdot bA) = -10 \cdot bA$. How strongly the Buyer feels this disappointment depends on his sensitivity to disappointment, D. This is a number between 0 and 1 so if D = 0 the Buyer will not feel disappointed at all and his payoff will be 0. However, if he is very sensitive, then D = 1 and he will feel the full brunt of his disappointment which is -10. Importantly, although the Buyer is disappointed here, there are no guilt or disappointment penalties for the Seller since he warned the Buyer of the good's quality. Also, if the product is of high quality, then both the Buyer and Seller get a payoff of 10. The important thing to point out is that if the Seller sends the m0 message, then he is absolved from lying or guilt-disappointment penalties no matter what the quality of the product is.

The situation changes when the Seller sends message m1 stating that, "The product is really of high quality". This is what we show in Figure 2. Look first at the right-hand branch of the figure indicating that the Buyer did not buy the product. Here if the product was in fact of high quality, both the Buyer and Seller will receive a payoff of 5. However, if the product is of low quality then since the Seller lied by sending message m1 he will pay a penalty of L for his lie. Remember that L can take on a value of either 0 or 20 so when its value is 20 the lying penalty will be substantial.

Finally look at the lower left-hand part of Figure 2. Here the Buyer buys after receiving the m1 message and hence the payoffs for both subjects will depend on whether the product is of high or low quality. If the good is of high quality (bottom left-hand corner of Figure 2) then both the Buyer and Seller will get a payoff of 10 since no one lied and no one was disappointed. However, if the Buyer buys after receiving the m1 message and the product was actually of a low quality, then the situation becomes a bit more complicated. Buyer's payoff is $D \cdot (0 - 10 \cdot bA)$, where bA indicates Buyer's belief that product is of high quality after getting message m1. To illustrate how this payoff may vary, say that the Buyer guesses that the message m1 indicates that the chance that the good is of high quality is 70% ($bA = 0.7$) and his sensitivity parameter $D = 0.5$. This indicates that the Buyer is relatively trusting that the message is not a lie and he is somewhat sensitive to disappointment. If the product turns out to be of high quality his payoff, as we saw above, will be 10. However, if the product turns out to be of low quality, his payoff will be $-10 \cdot 0.7 \cdot 0.5 = -3.5$. Obviously, this payoff will differ depending on the Buyer's guesses and his sensitivity to disappointment. However, the range of payoff will be somewhere between 0 and -10 when the product is of low quality. If the product turns out to be of high quality after the message m1 is sent, then the payoff for the Buyer will always be 10. Hence, the decision to buy will depend on how trusting the Buyer is of the message sent, his bA, and his sensitivity to disappointment, D.

Finally consider the payoff for the Seller when, knowing the product is of low quality, he sends message m1 and the Buyer buys the good.

Here his payoff is denoted by $21 - (G \cdot 10 \cdot bB \cdot D) - L$. This payoff has three parts. The first, 21, is simply the payoff the Seller gets from unloading a low quality product on the Buyer. However, since he lied in doing so and said the product was of high quality knowing it was of low quality, we subtract L for his lie. This leaves the middle term $-G \cdot 10 \cdot bB \cdot D$. This term basically measures how guilty the Seller is about disappointing the Buyer. When the Buyer receives the m1 message he tends to believe the product is of high quality. The Seller's guesses that the Buyer expected the good will be of high quality when he hears the m1 message is given by bB. How much the Seller cares about this depends on his guilt parameter G, which can take only two values, either $G = 0$ or $G = 5$. When $G = 0$, the Seller does not care at all about disappointing the Buyer, and hence this middle term will be zero. If he cares a lot ($G = 6$), this middle term will be negative and will be subtracted from 21. For the Buyer, since the good is of low quality, his payoff is 0 and hence his disappointment is $(0 - 10 \cdot bB \cdot D)$. Let's take an example: suppose the Seller cares a lot about guilt ($G = 6$) and believes that the Buyer will really trust him after hearing message m1 i.e., Buyer's $bB = 0.9$. Further, the Buyer's sensitivity to disappointment is $D = 0.7$. Then the Seller's disappointment payoff will be $-6 \cdot 10 \cdot 0.9 \cdot 0.7 = -37.8$ and his total payoff will be $21 - 37.8 - L = -16.8 - L$. If $L = 0$ then the Seller's total payoff will be -16.8 while if $L = 20$, it will be -36.8.

Also because your payoffs in the game can be complicated in the situation where the Seller sends the m1 message knowing that the good is of low quality, (the payoffs in all other situations can easily be read off from the figures above) we are providing you with a calculator that will help you evaluate what your payoff in this circumstance will be depending on the assumptions you make.

For example, for the Buyer, if you receive the m1 message then your payoff will depend on the guess bA you entered in the guessing exercise you engaged in and on your random disappointment sensitivity parameter, D. However since you have already entered your belief in the guessing exercise, the calculator will allow you to see how your payoff varies when the computer assigns you the various Ds over the range 0 to 1 and you decide to buy or not. So, knowing the guess you already entered, you can enter different hypothetical Ds into the calculator and see the expected payoff you would get if you decided to buy or not.

If you are a Seller your payoff will depend on the value of G, L, D, and your guess (bB) about the Buyer's guess about you. So in your calculator, given the belief bB you previously entered, the calculator will allow you to enter values for G, L, and D (which is how sensitive you think the Buyer is to being disappointed). Remember G can take on only values of 0 and 6 while L can take on values of only 0 and 20 while D can take on values between 0 and 1. If you enter hypothetical values for these numbers into the calculator and hit enter, the calculator will present you with your payoff if the buyer buys or not.

Summary

While the payoffs described above may be complicated the experiment itself is not. It can be summarized as follows:

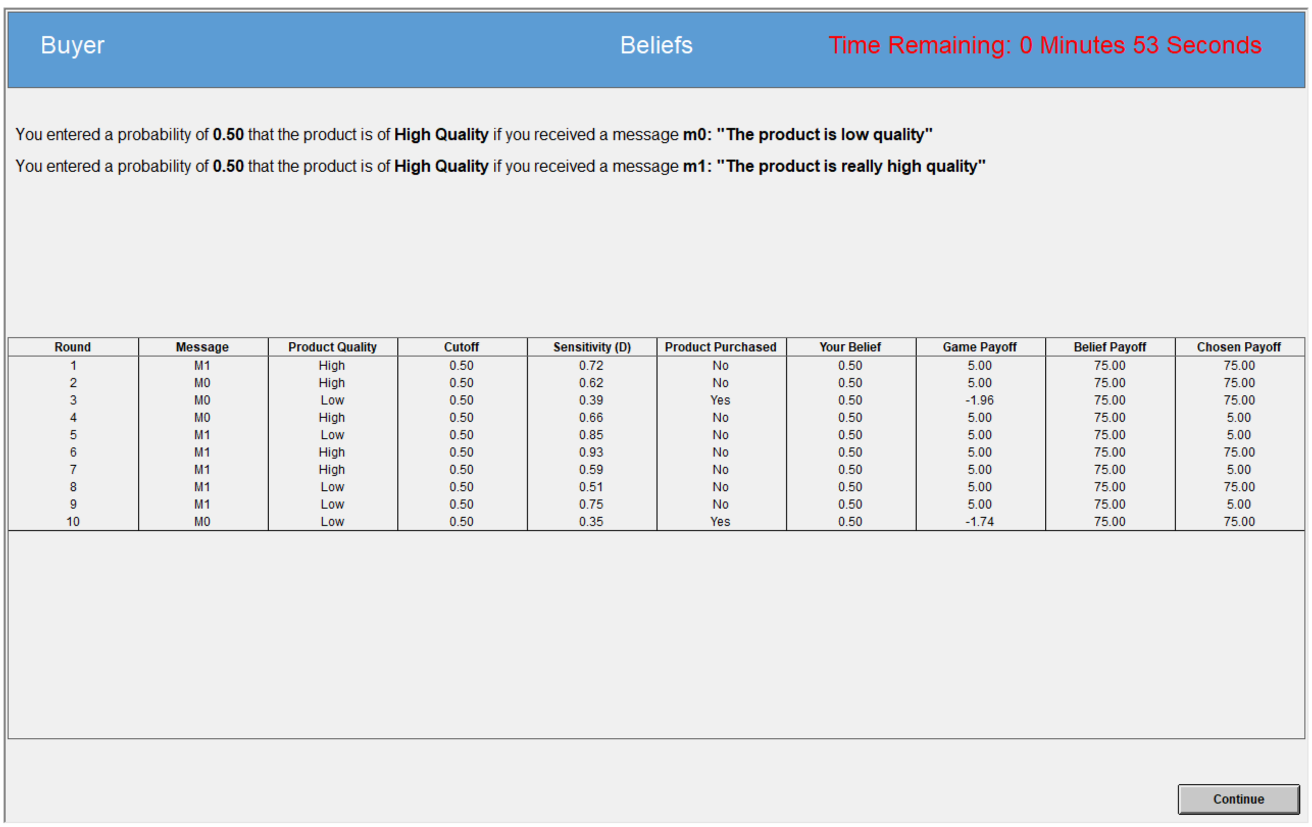
1. There is a buyer and a seller.
2. The seller is selling a good that can be either of high or low quality and knows what the quality is before sending a message to the buyer telling him what that quality is (m0 or m1).
3. If he sends a message that the good is of high quality knowing while knowing it is of low quality, then he is lying and he may experience a cost of lying.
4. The seller may also feel bad that he misled the Buyer if the buyer relies on his message and buys a low-quality good expecting it to be of high quality.
5. How sensitive the seller is to lying and misleading the Buyer depends on his type which is randomly determined.
6. He may not care at all about lying and misleading or he may care a lot. He may care about one and not the other.
7. How disappointed the buyer is by being misled is also randomly determined.
8. The task for the Seller is to determine what message to send for each type of Seller he may turn out to be (for each pair of lying and misleading costs).
9. The task of the Buyer is to decide whether to buy the good given the message he receives knowing that he may be disappointed if he is tricked but not knowing how large that disappointment will be when he makes his decision. He has to determine a disappointment cutoff for each message received telling him to buy if his random disappointment value is below that cutoff.

10. These decisions will be made before each block of ten rounds and one block will be chosen for payment. In each round of this block we will randomly (with equal probability) determine if you will be paid for your guesses or your game payoffs and then sum up your payoffs over the 10 rounds of the chosen block. We will then convert your ECU payoff into dollars at the rate of 1 ECU = \$0.06 if you are a Buyer, and at the rate of 1 ECU = \$0.008 if you are a Seller.

11. It is never beneficial to not report your beliefs truthfully.

3 Screenshots: Feedback in both treatments

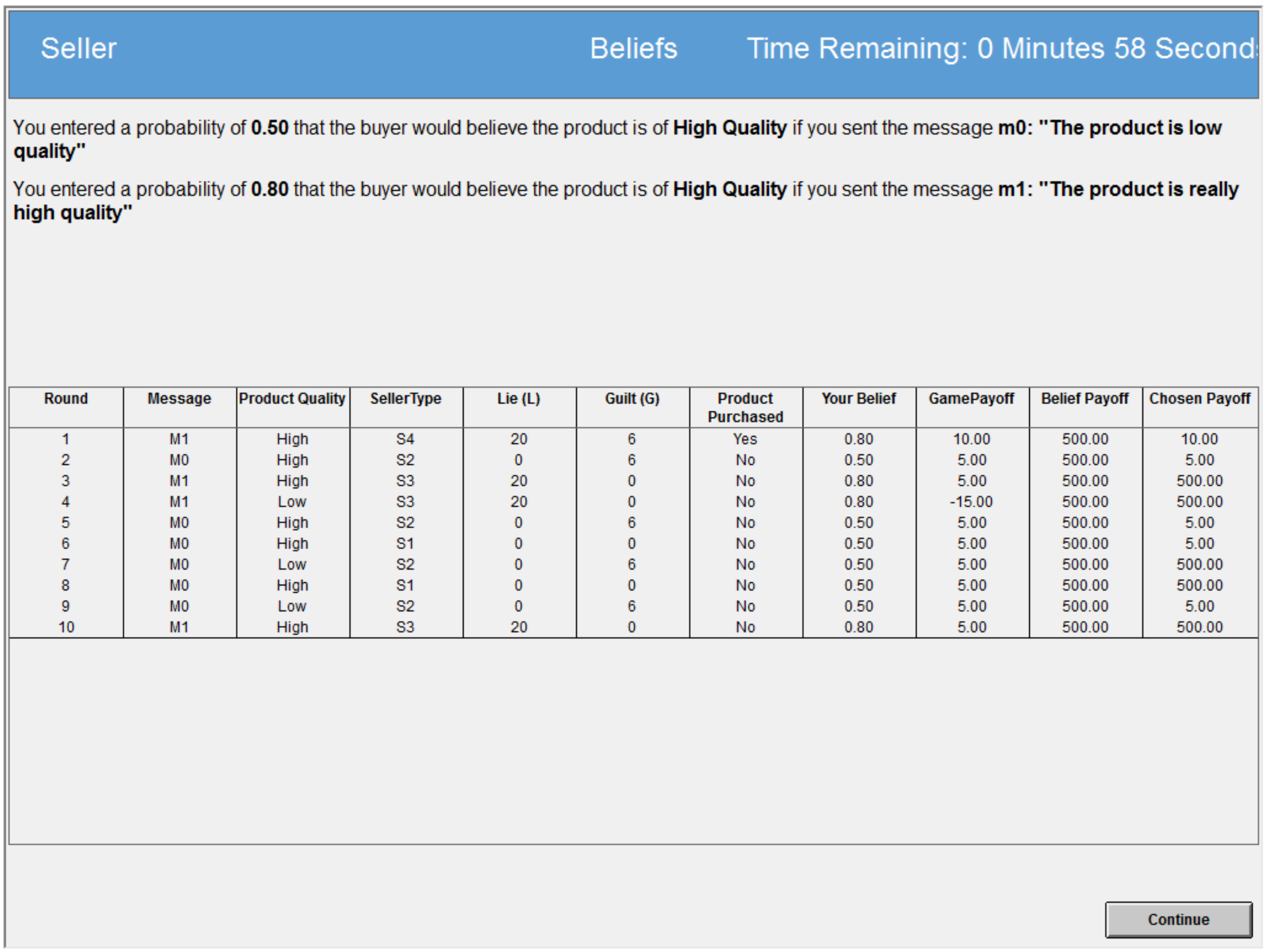
Figure 1: Feedback screen for the Buyers in No-Competition treatment



Round	Message	Product Quality	Cutoff	Sensitivity (D)	Product Purchased	Your Belief	Game Payoff	Belief Payoff	Chosen Payoff
1	M1	High	0.50	0.72	No	0.50	5.00	75.00	75.00
2	M0	High	0.50	0.62	No	0.50	5.00	75.00	75.00
3	M0	Low	0.50	0.39	Yes	0.50	-1.96	75.00	75.00
4	M0	High	0.50	0.66	No	0.50	5.00	75.00	5.00
5	M1	Low	0.50	0.85	No	0.50	5.00	75.00	5.00
6	M1	High	0.50	0.93	No	0.50	5.00	75.00	75.00
7	M1	High	0.50	0.59	No	0.50	5.00	75.00	5.00
8	M1	Low	0.50	0.51	No	0.50	5.00	75.00	75.00
9	M1	Low	0.50	0.75	No	0.50	5.00	75.00	5.00
10	M0	Low	0.50	0.35	Yes	0.50	-1.74	75.00	75.00

Notes: This is the screen that the Buyers observed at the end of each block of 10 periods in the No-Competition treatment.

Figure 2: Feedback screen for the Sellers in No-Competition treatment



Seller Beliefs Time Remaining: 0 Minutes 58 Second

You entered a probability of **0.50** that the buyer would believe the product is of **High Quality** if you sent the message **m0: "The product is low quality"**

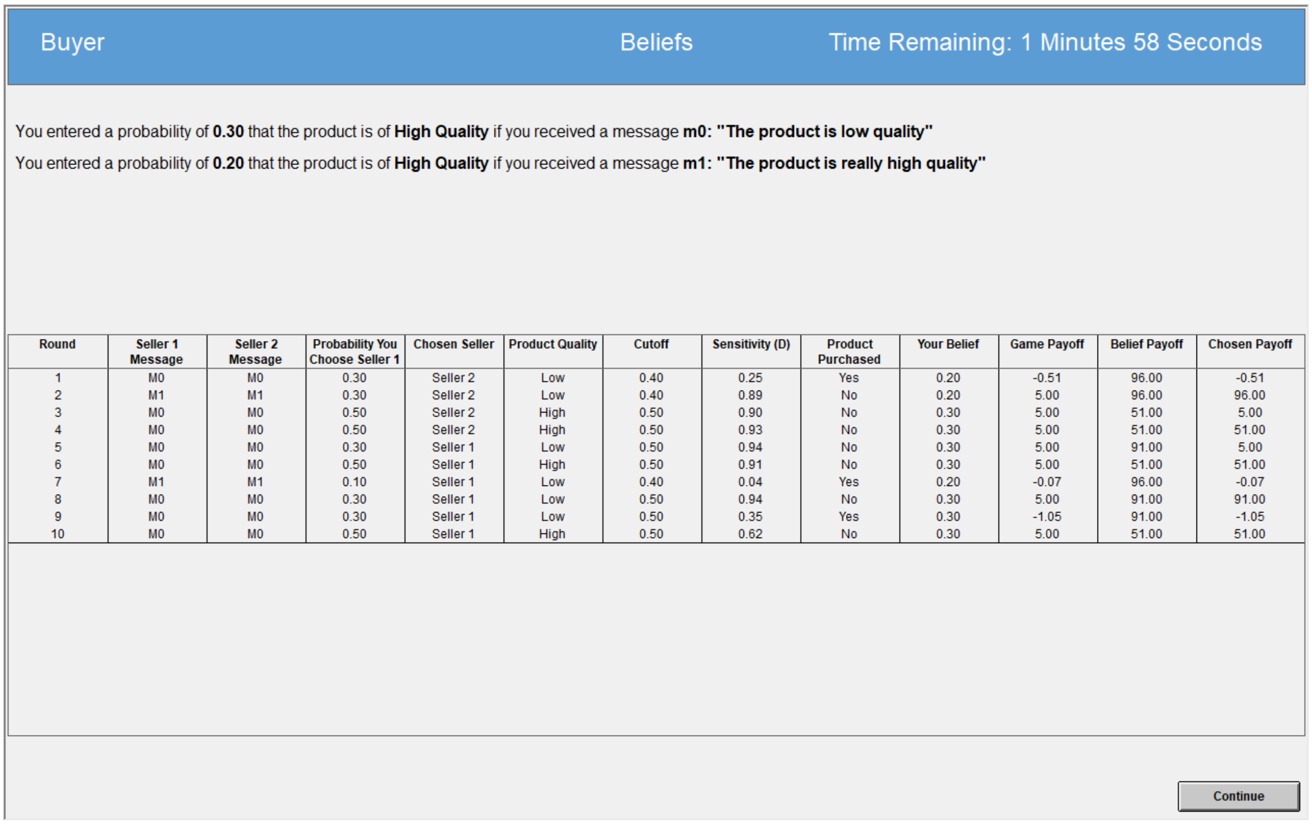
You entered a probability of **0.80** that the buyer would believe the product is of **High Quality** if you sent the message **m1: "The product is really high quality"**

Round	Message	Product Quality	SellerType	Lie (L)	Guilt (G)	Product Purchased	Your Belief	GamePayoff	Belief Payoff	Chosen Payoff
1	M1	High	S4	20	6	Yes	0.80	10.00	500.00	10.00
2	M0	High	S2	0	6	No	0.50	5.00	500.00	5.00
3	M1	High	S3	20	0	No	0.80	5.00	500.00	500.00
4	M1	Low	S3	20	0	No	0.80	-15.00	500.00	500.00
5	M0	High	S2	0	6	No	0.50	5.00	500.00	5.00
6	M0	High	S1	0	0	No	0.50	5.00	500.00	5.00
7	M0	Low	S2	0	6	No	0.50	5.00	500.00	500.00
8	M0	High	S1	0	0	No	0.50	5.00	500.00	500.00
9	M0	Low	S2	0	6	No	0.50	5.00	500.00	5.00
10	M1	High	S3	20	0	No	0.80	5.00	500.00	500.00

Continue

Notes: This is the screen that the Sellers observed at the end of each block of 10 periods in the No-Competition treatment.

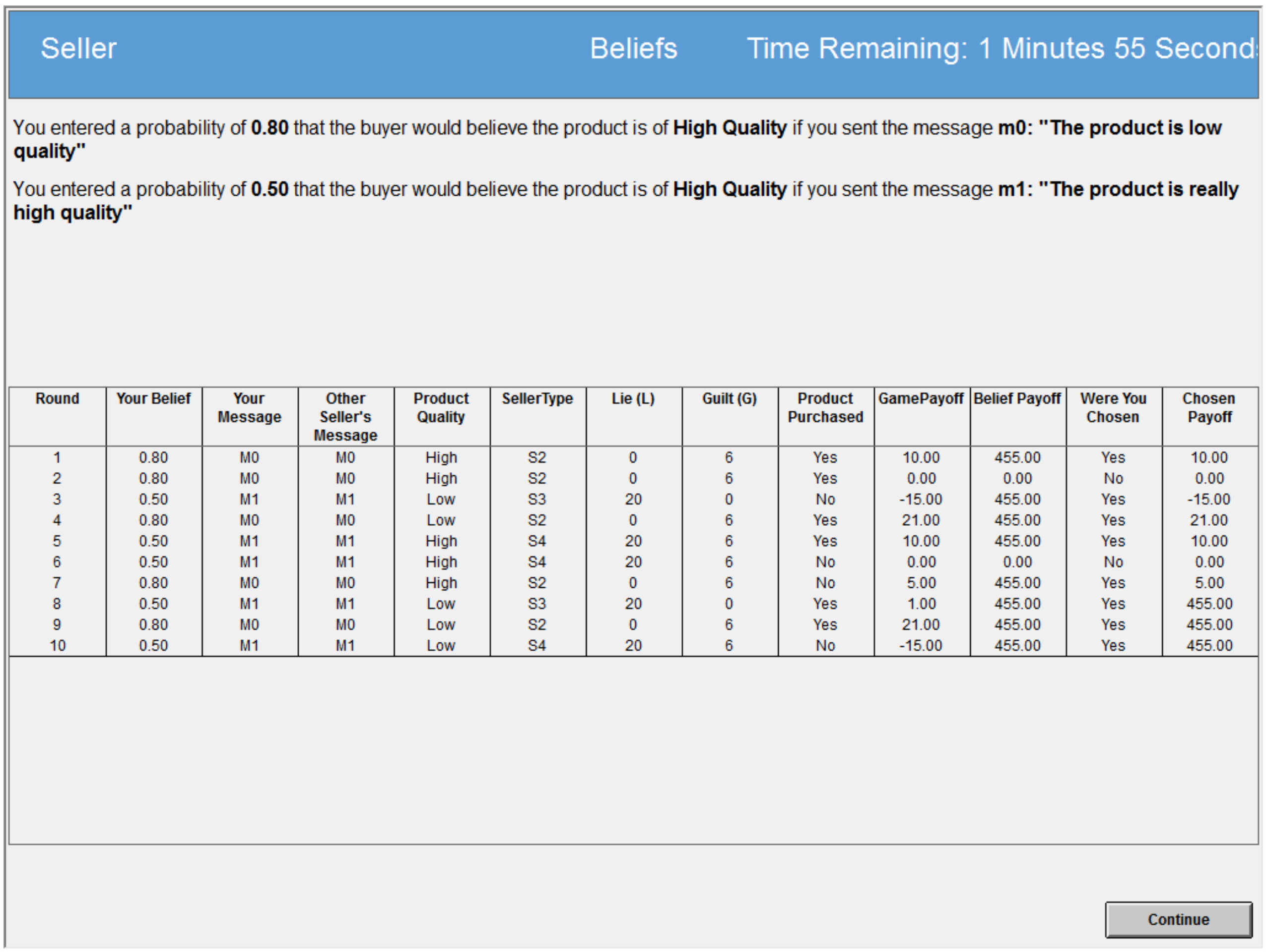
Figure 3: Feedback screen for the Buyers in Competition treatment



Round	Seller 1 Message	Seller 2 Message	Probability You Choose Seller 1	Chosen Seller	Product Quality	Cutoff	Sensitivity (D)	Product Purchased	Your Belief	Game Payoff	Belief Payoff	Chosen Payoff
1	M0	M0	0.30	Seller 2	Low	0.40	0.25	Yes	0.20	-0.51	96.00	-0.51
2	M1	M1	0.30	Seller 2	Low	0.40	0.89	No	0.20	5.00	96.00	96.00
3	M0	M0	0.50	Seller 2	High	0.50	0.90	No	0.30	5.00	51.00	5.00
4	M0	M0	0.50	Seller 2	High	0.50	0.93	No	0.30	5.00	51.00	51.00
5	M0	M0	0.30	Seller 1	Low	0.50	0.94	No	0.30	5.00	91.00	5.00
6	M0	M0	0.50	Seller 1	High	0.50	0.91	No	0.30	5.00	51.00	51.00
7	M1	M1	0.10	Seller 1	Low	0.40	0.04	Yes	0.20	-0.07	96.00	-0.07
8	M0	M0	0.30	Seller 1	Low	0.50	0.94	No	0.30	5.00	91.00	91.00
9	M0	M0	0.30	Seller 1	Low	0.50	0.35	Yes	0.30	-1.05	91.00	-1.05
10	M0	M0	0.50	Seller 1	High	0.50	0.62	No	0.30	5.00	51.00	51.00

Notes: This is the screen that the Buyers observed at the end of each block of 10 periods in the Competition treatment.

Figure 4: Feedback screen for the Sellers in Competition treatment



Seller Beliefs Time Remaining: 1 Minutes 55 Second

You entered a probability of **0.80** that the buyer would believe the product is of **High Quality** if you sent the message **m0: "The product is low quality"**

You entered a probability of **0.50** that the buyer would believe the product is of **High Quality** if you sent the message **m1: "The product is really high quality"**

Round	Your Belief	Your Message	Other Seller's Message	Product Quality	SellerType	Lie (L)	Guilt (G)	Product Purchased	GamePayoff	Belief Payoff	Were You Chosen	Chosen Payoff
1	0.80	M0	M0	High	S2	0	6	Yes	10.00	455.00	Yes	10.00
2	0.80	M0	M0	High	S2	0	6	Yes	0.00	0.00	No	0.00
3	0.50	M1	M1	Low	S3	20	0	No	-15.00	455.00	Yes	-15.00
4	0.80	M0	M0	Low	S2	0	6	Yes	21.00	455.00	Yes	21.00
5	0.50	M1	M1	High	S4	20	6	Yes	10.00	455.00	Yes	10.00
6	0.50	M1	M1	High	S4	20	6	No	0.00	0.00	No	0.00
7	0.80	M0	M0	High	S2	0	6	No	5.00	455.00	Yes	5.00
8	0.50	M1	M1	Low	S3	20	0	Yes	1.00	455.00	Yes	455.00
9	0.80	M0	M0	Low	S2	0	6	Yes	21.00	455.00	Yes	455.00
10	0.50	M1	M1	Low	S4	20	6	No	-15.00	455.00	Yes	455.00

Continue

Notes: This is the screen that the Sellers observed at the end of each block of 10 periods in the Competition treatment.

4 Belief elicitation procedure

In this section we discuss beliefs elicitation procedures we used to elicit buyers' first-order beliefs and sellers' second-order beliefs regarding buyers' first-order beliefs. Additionally, we elaborate on our payment scheme for both the belief task and the game. We demonstrate that, in psychological games, standard tools for eliciting beliefs, such as quadratic scoring rules, are generally not incentive-compatible. This is because reported beliefs not only affect the payment subjects receive for the belief elicitation task but also influence their payoffs in the game. However, we carefully selected parameters for the payment scheme to ensure that misreporting one's true beliefs results in only a negligible increase in subjects' payoffs. Based on this, we believe that our payment scheme is 'essentially' incentive-compatible.

4.1 Eliciting Buyers' Beliefs

In our experiment, we elicit two beliefs from the buyers:

- the probability that a seller has a high-quality product conditional on sending m_0
- the probability that a seller has a high-quality product conditional on sending m_1

We used the standard quadratic scoring rule to incentivize buyers to report their beliefs. Specifically, there are two states of the world, $s \in \{0, 1\}$. The state in which message m_i is sent by a high-quality seller is denoted by $s = 1$ and the state in which message m_i is sent by a low-quality seller is denoted by $s = 0$. Denote by $p(m_i)$ the true belief of the buyer regarding state $s = 1$ with the remaining probability $1 - p(m_i)$ representing the buyer's belief about $s = 0$. Say, that our buyer reports to us r instead of her true belief $p(m_i)$. Then her expected payoff from beliefs task is

$$\begin{aligned}\mathbb{E}\Pi^{\text{beliefs}}\left(p(m_i), r\right) = & p(m_i) \cdot \left[X - Y \cdot \left((1-r)^2 + (0 - (1-r))^2\right)\right] + \\ & + (1 - p(m_i)) \cdot \left[X - Y \cdot \left((0-r)^2 + (1-(1-r))^2\right)\right] = \\ & = p(m_i) \cdot \left[X - 2Y(1-r)^2\right] + (1 - p(m_i)) \cdot \left[X - 2Yr^2\right],\end{aligned}$$

where (X, Y) are the parameters set by the experimenter.[3] In our experiment, we chose $X = 100$ and $Y = 50$.

Now let's calculate the payoff of this buyer from playing the game. This payoff depends on disappointment parameter ω, true belief $p(m_i)$, and reported belief r:

$$\mathbb{E}\Pi^{\text{game}}\left(p(m_i), r, \omega\right) = \begin{bmatrix} 10p(m_i) + (1 - p(m_i) \cdot (-10\omega \cdot r) & \text{if this payoff is greater than 5} \\ 5 & \text{otherwise} \end{bmatrix}.$$

[3]When the state is $s = 1$ the buyer who reports r makes two mistakes: she underestimates the correct probability of state $s = 1$ by reporting r instead of 1 and she overestimates the correct probability of state $s = 0$ by reporting $1 - r$ instead of 0.

Therefore, the overall expected payoff of the buyer is

$$\mathbb{E}\Pi^{\text{Buyer}}\left(p(m_i), r, \omega\right) = \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{belief}}\left(p(m_i), r\right) + \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{game}}\left(p(m_i), r, \omega\right).$$

Risk-neutral buyer should report belief r which maximizes his overall expected payoff $\mathbb{E}\Pi^{\text{Buyer}}\left(p(m_i), r, \omega\right)$. The optimal report r^* is

$$r^* = \begin{cases} p(m_i) & \text{if } p(m_i) \leq \bar{p}(m_i) \\ p(m_i) \cdot \left(1 + \dfrac{5}{2Y}\right) - \dfrac{5}{2Y} & \text{otherwise} \end{cases},$$

where $\bar{p}(m_i) = \frac{1}{\sqrt{2}} = 0.7071$. The cutoff $\bar{p}(m_i)$ does not depend on (X, Y) as long as $Y \geq 10$. Note, that $\max|p(m_i) - r^*| = \frac{5}{2Y} \cdot (1 - \bar{p}(m_i))$, which is really small for $Y > 10$.

Finally, the distortions computed above are the highest possible, since they are computed for the buyer with the highest disappointment sensitivity parameter of $\omega = 1$. For example, when $X = 100$ and $Y = 50$, the highest distortion in beliefs reported by the buyer is

$$\max|p(m_i) - r^*| = 0.01,$$

which means that our payment scheme is "practically" incentive compatible.

Eliciting Sellers' Beliefs

We also elicit two beliefs from the sellers:

- A seller's belief about a buyer's belief that a seller has a high-quality product conditional on sending message m_0
- A seller's belief about a buyer's belief that a seller has a high-quality product conditional on sending message m_1

We used a relatively simple scheme that elicits the mean seller's belief (rather than eliciting the whole distribution). Specifically, denote by $z^B(m_i)$ the first-order belief of a buyer that a seller has a high-quality product if he sends message m_i. We are interested in eliciting the second-order beliefs of sellers about $z^B(m_i)$. Say that a seller has a distribution in mind regarding $z^B(m_i)$. For instance, a seller believes that $z^B(m_i) = v_1$ with probability p_1, $z^B(m_i) = v_2$ with probability p_2 and $z^B(m_i) = v_3$ with probability p_3, where $p_1 + p_2 + p_3 = 1$. However, we do not allow sellers to specify the distribution. Instead, we are asking them for one number, let's call it q. We will be paying sellers for how close their belief is to the belief $z^B(m_i)$ that buyers report using the quadratic scoring rule. Therefore, the expected payoff of a seller from the belief task is $V - W \cdot \left[p_1(v_1 - q)^2 + p_2(v_2 - q)^2 + p_3(v_3 - q)^2\right]$ where parameters take values $V = W = 500$. That means, that the risk-neutral seller would choose to report the average belief $q = p_1 v_1 + p_2 v_2 + p_3 v_3$ since this report maximizes his expected payoff.

From now on, denote by $p(m_i)$ the true average second-order belief of a seller regarding the first-order belief of a buyer upon receiving message m_i, while $x(m_i)$ is the belief reported by a seller in our beliefs' elicitation task.

If the game is chosen for payment, then a seller will get a payoff of

$$\mathbb{E}\Pi^{\text{game}}(p(m_i), x(m_i), (q_H, g, l)) = \Pr[\text{Buy}|m_i] \cdot 10 + (1 - \Pr[\text{Buy}|m_i]) \cdot 5 \qquad \forall m_i,$$

$$\mathbb{E}\Pi^{\text{game}}(p(m_1), x(m_1), (q_L, g, l)) = \Pr[\text{Buy}|m_1] \cdot (21 - g \cdot 10x(m_1) \cdot \mathbb{E}[\omega|m_1, \text{Buy}] - l) + (1 - \Pr[\text{Buy}|m_1]) \cdot (5 - l), \text{ or}$$
$$\mathbb{E}\Pi^{\text{game}}(p(m_0), x(m_0), (q_L, g, l)) = \Pr[\text{Buy}|m_0] \cdot (21 - g \cdot 10x(m_0) \cdot \mathbb{E}[\omega|m_0, \text{Buy}]) + (1 - \Pr[\text{Buy}|m_0]) \cdot 5,$$

where $\Pr[\text{Buy}|m_i]$ and $\mathbb{E}[\omega|m_i, \text{Buy}])$ are calculated based on the seller's true belief $p(m_i)$.

That is,

$$\Pr[\text{Buy}|m_i] = \min\left\{\frac{2p(m_i) - 1}{2p(m_i)(1 - p(m_i))}, 1\right\} \text{ and } \mathbb{E}[\omega|m_i, \text{Buy}] = \min\left\{\frac{2p(m_i) - 1}{4p(m_i)(1 - p(m_i))}, \frac{1}{2}\right\}$$

provided that $p(m_i) \geq \frac{1}{2}$ and $\Pr[\text{Buy}|m_i] = \mathbb{E}[\omega|m_i, \text{Buy}] = 0$ otherwise.

The overall expected payoff of a seller is

$$\mathbb{E}\Pi^{\text{Seller}}(p(m_i), x(m_i), (q_H, g, l)) = \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{belief}}(p(m_i), x(m_i)) + \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{game}}(p(m_i), x(m_i), (q_H, g, l))$$

or

$$\mathbb{E}\Pi^{\text{Seller}}(p(m_i), x(m_i), (q_L, g, l)) = \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{belief}}(p(m_i), x(m_i)) + \frac{1}{2} \cdot \mathbb{E}\Pi^{\text{game}}(p(m_i), x(m_i), (q_L, g, l))$$

depending on his type and message that he chose to send, where

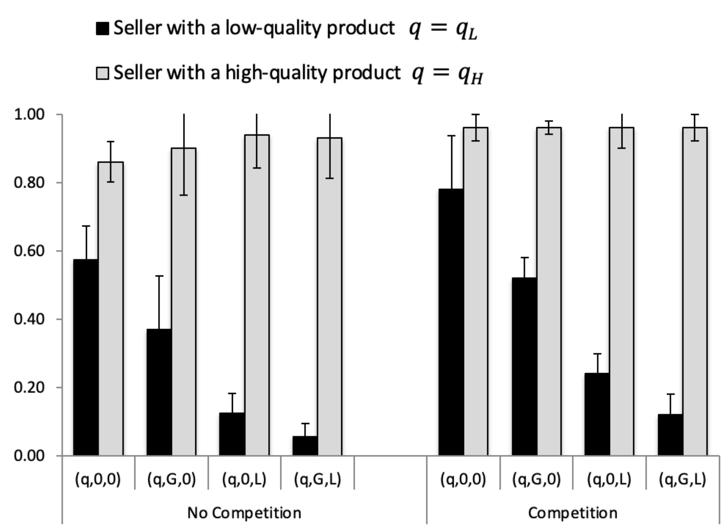
$$\mathbb{E}\Pi^{\text{belief}}(p(m_i), x(m_i)) = V - W \cdot (p(m_i) - x(m_i))^2 = 500 - 500 \cdot (p(m_i) - x(m_i))^2.$$

Notice that the seller's reported beliefs affect the seller's game payoffs only when he owns a low-quality product and has a positive guilt parameter $g = G > 0$. In all other cases, the seller's payoff in the game is independent of the reported belief, which means that the seller would maximize his payoff by reporting his true average second-order belief, i.e., $x^*(m_i) = p(m_i)$. For the seller with a low-quality product and positive guilt sensitivity $g = G > 0$, the highest distortion is three percentage points, i.e., $\max|p(m_1) - x^*(m_1)| = 0.03$. We, therefore, expect that subjects would report their beliefs truthfully since this is the best they can do to maximize their payoff in our experiment.

5 Additional analysis of experimental data

Communication Strategy of Sellers (first 5 blocks). Figure 5 presents the communication strategies of sellers in the first 5 blocks of our experimental sessions. This figure shows results similar to those presented in the main manuscript, i.e., our sellers were using very similar communication strategies both in the first 5 and the last 5 blocks of the experiment.

Figure 5: Communication Strategies of Sellers in Markets with Psychological Payoffs, first 5 blocks



Notes: Average frequency of sending message m_1 is presented for each type of the Seller in each treatment in the first half of the experiment. 95% confidence intervals are computed using robust standard errors obtained by clustering observations by session.

Buyers' and Sellers' Payoffs. In Table 1 we replicate Table 4 presented in the main manuscript for the first 5 blocks of the experiment. Specifically, we are interested in understanding which types of buyers and sellers suffer the most from the competition. For this exercise, we focus on the payoffs of the selected seller in the Competition treatment, given that the non-selected seller earns zero payoffs.

The results concerning sellers' payoffs look very similar between the first and the last 5 blocks of the experiment. On the contrary, results are quite different for buyers: while we don't observe any significant differences between buyers' payoffs in the game with and without competition in the first 5 blocks, this is not the case in the last 5 blocks of the experiment, in which buyers with high sensitivity for disappointment suffer from the presence of competition.

Table 1: Which Types of Buyers and Sellers Suffer the Most from Competition in the First 5 Blocks?

		No Competition	Competition	Difference
SELLERS	$(q_L, 0, 0)$	12.07 (0.63)	14.03 (0.88)	YES* ($p = 0.09$)
	$(q_L, G, 0)$	8.32 (0.55)	7.83 (0.68)	NO ($p = 0.57$)
	$(q_L, 0, L)$	8.70 (1.34)	1.75 (0.84)	YES** ($p < 0.01$)
	(q_L, G, L)	8.83 (0.61)	1.33 (1.74)	YES** ($p < 0.01$)
	$(q_H, 0, 0)$	7.96 (0.27)	7.54 (0.22)	NO ($p = 0.22$)
	$(q_H, G, 0)$	7.75 (0.38)	8.01 (0.32)	NO ($p = 0.60$)
	$(q_H, 0, L)$	7.70 (0.23)	7.68 (0.36)	NO ($p = 0.92$)
	(q_H, G, L)	7.85 (0.23)	7.57 (0.23)	NO ($p = 0.39$)
BUYERS	$\omega \leq 0.2$	4.02 (0.28)	4.27 (0.32)	NO ($p = 0.55$)
	$0.2 < \omega \leq 0.4$	4.49 (0.34)	3.59 (0.49)	NO ($p = 0.16$)
	$0.4 < \omega \leq 0.6$	4.37 (0.25)	4.28 (0.30)	NO ($p = 0.81$)
	$0.6 < \omega \leq 0.8$	4.29 (0.25)	4.63 (0.25)	NO ($p = 0.34$)
	$\omega > 0.8$	4.92 (0.15)	4.62 (0.25)	NO ($p = 0.34$)

Notes: We report average payoffs of buyers and (selected) sellers in the first five blocks of the experiment and the robust standard error in parentheses. The last column reports the results of a statistical test comparing payoffs for a fixed type of buyer or seller in the two treatments. * and ** indicate significance at the 10% and the 5% levels, respectively.

Individual-level Analysis of Buyers' and Sellers' Strategies in the No Competition and Competition Treatments. Here we look at individual behavior in an attempt to recover the distribution of strategies used by buyers and sellers in the No Competition and Competition treatments. This exercise is informative as it speaks to the equilibrium selection issue we brought up earlier.

A seller's strategy consists of specifying eight messages: one for each seller's type. In Table 2 we present a breakdown of our sellers' strategies in two treatments. We treat strategies reported by sellers in each block as an independent observation. This allows us to capture learning behavior across blocks, as subjects might change their strategies based on their experiences from previously played blocks.

Recall that the pooling equilibrium requires all sellers to send message m_0, which is the costless lie for the high-quality sellers. Table 2 shows that essentially no sellers play such a strategy. On the contrary, most sellers with high-quality products send a truthful message m_1. Depending on the behavior of sellers who own low-quality products, we classify observed strategies as consistent with either one of the informative equilibria or as a non-equilibrium behavior. Three strategies emerge as the most commonly played strategies right from the start of the experiment in both treatments and remain so till the end of the experiment: TRUTH (sellers revealing the quality of their product truthfully, which is not part of any equilibrium strategy), PIE1, or PIE2. However, we find an important difference in behavior between the two treatments especially after subjects had gained some experience with the game. In the last 5 blocks of the No Competition treatment, the most common strategy used by the sellers is TRUTH. Such a strategy is observed in 51% of the

Table 2: Sellers' Communication Strategies in Games with Psychological Payoffs

		first 5 blocks		last 5 blocks	
		No Comp	Comp	No Comp	Comp
	Total # of obs	100%	100%	100%	100%
POOLING	All types send m_0	1%	0%	0%	0.5%
	Types (q_H, g, l) for all g and l send m_1	77%	90%	79%	90%
	and	of which	of which	of which	of which
TRUTH	for all g and l, types (q_L, g, l) send m_0	46%	21%	51%	21%
PIE2	$(q_L, 0, 0)$ sends m_1, while all other (q_L, g, l) send m_0	17%	20%	17%	13%
PIE1	for all g and l, $(q_L, g, 0)$ send m_1 and (q_L, g, L) send m_0	26%	37%	25%	39%
	(q_L, G, L) sends m_0, while all other (q_L, g, l) send m_1	4%	7%	1%	13%
	for all g and l, (q_L, g, l) send m_1	5%	8%	3%	9%
	remaining observations	2%	6%	2%	5%

Notes: In this table we treat a strategy of a seller in a block as an independent observation.

cases in which sellers with a high-quality product send message m_1. The fraction of sellers telling the truth is significantly lower in the Competition treatment (only 21%). The most commonly used strategy in the Competition treatment is the PIE1 equilibrium strategy, in which two of the four types of sellers with low-quality products lie, while the remaining two tell the truth. There is also a significant fraction of sellers in both treatments who play the PIE2 equilibrium (17% in the No Competition and 13% in the Competition treatment) in the last 5 blocks of the experiment. These results are consistent with the aggregate behavior of sellers analyzed above, i.e., sellers with low-quality products lie much more in the Competition treatment than in the No Competition treatment.

Table 3: Buyers' Purchasing Strategies

		first 5 blocks		last 5 blocks	
		No Competition	Competition	No Competition	Competition
	Total # of obs	100%	100%	100%	100%
POOLING	$\lvert\bar{\omega}(m_1) - \bar{\omega}(m_0)\rvert < 0.1$	28%	39%	27%	27%
PIE	$\bar{\omega}(m_1) \geq \bar{\omega}(m_0) + 0.1$	57%	51%	56%	63%
		of which	of which	of which	of which
	$\bar{\omega}(m_1) < 0.4$	8%	0%	4%	1%
PIE1	$0.4 \leq \bar{\omega}(m_1) < 0.6$	20%	19%	12%	12%
	$0.6 \leq \bar{\omega}(m_1) < 0.8$	32%	46%	37%	29%
PIE2	$0.8 \leq \bar{\omega}(m_1)$	39%	35%	47%	58%

Notes: In this table we treat a strategy of a buyer in a block as an independent observation.

To classify buyers' strategies, we use buyers' cutoffs reported in each block of the experiment, and, instead of the point predictions, focus on the qualitative features of different equilibria described in section 2.4. We start by classifying buyers' strategies into those that play pooling equilibrium and those that play partially informative equilibria (the first two rows in Table 3). Buyers who set very similar cutoffs for both m_1 and m_0 messages, i.e., cutoffs that are less than 10 percentage points apart, are characterized as playing a pooling strategy since they essentially behave the same way irrespective of the received message. On the contrary, buyers who set the cutoff for an m_1 message at least 10 percentage points higher than the cutoff for an m_0 message are classified as playing a PIE. Distinguishing which PIE a buyer is playing is a more complicated task since as we argued in the paper, risk attitude might affect purchasing cutoff for an m_1 message. However, if one adheres to the assumption of risk-neutrality, then we can say that a buyer plays PIE1 if she sets the cutoff for message m_1 close to 0.51 (between 0.4 and 0.6 to allow for some small noise), while a buyer plays PIE2 if she sets the cutoff for message m_1 close to 1 (above 0.8 to allow for small noise).[4]

Our data on buyer behavior reveals a few interesting patterns. First, Table 3 shows that by the end of the experiment, only about a quarter of buyers in each treatment play a pooling strategy. In fact, buyers in the Competition treatment play this strategy less and less as they experience the game: the fraction of those who play a pooling strategy decreases from 39% in the first 5 blocks to 27% in the last 5 blocks. Second, in both treatments, we observe quite a lot of heterogeneity in terms of the cutoff that buyers set after observing an m_1 message. This might be driven by differences in the risk attitudes of our experimental buyers. Despite this heterogeneity, the vast majority of these cutoffs are quite high (above 0.6) which is consistent with playing the most informative equilibrium PIE2 and being risk-averse. Third, if one insists on risk neutrality, then buyers rarely play the PIE1 strategy in either of the treatments (less than 15% in both treatments in the last 5 blocks), while they play the PIE2 strategy more often in the Competition than in the No Competition treatment ($p = 0.057$).

Beliefs in the first 5 blocks of the experiment. Table 4 replicates Table 6 in the main manuscript for the first half of the experiment. We find that sellers predict buyers' beliefs correctly from the start of the experiment except for the m_1 message in the Competition treatment. Moreover, similar to the last 5 blocks of the experiment, buyers consistently overestimate the meaning of the m_1 messages in the Competition treatment, while they do so less in the No Competition treatment.

Figure 6 depicts the cumulative distributions of the buyers' initial beliefs (interpretations) about the m_1 message as they just start the experiment (in the first two blocks) comparing the treatment with and without competition. The beliefs observed in the competition treatment are generally higher than those in the no competition treatment, showing that our subjects start the experiment believing that the mere presence of competition makes sellers more truthful and trustworthy.

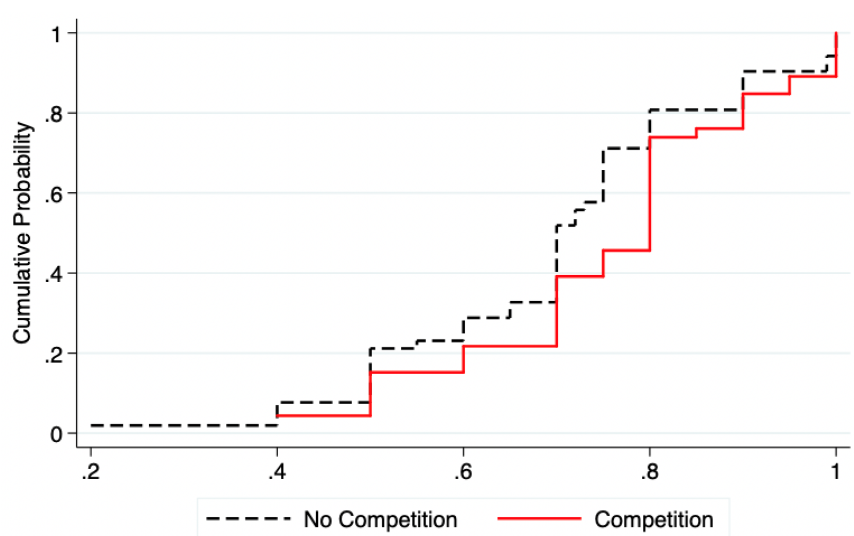
[4]We focus on the purchasing cutoffs that buyers report for an m_1 message since this is what distinguishes different types of partially informative equilibria. All PIEs predict that purchasing cutoffs, upon observing an m_0 message should be zero. Despite that, most of our buyers chose strictly positive purchasing cutoffs upon observing an m_0 message. This is consistent with the fact that some sellers with high-quality goods chose to send an m_0 message.

Table 4: Buyers' and Sellers' Beliefs, Buyers' Purchasing Cutoffs, and Actual Quality of Products for Different Messages, first 5 blocks

	observed				$z^B(m_i) = z^S(m_i)$	$z^B(m_i) = \Pr[q_H \mid m_i]$	$z^S(m_i) = \Pr[q_H \mid m_i]$
	$\omega'(m_i)$	$z^B(m_i)$	$z^S(m_i)$	$\Pr[q_H \mid m_i]$			
No Competition							
message m_0	0.31 (0.02)	0.24 (0.03)	0.22 (0.03)	0.07 (0.04)	$p = 0.218$	$p < 0.001$	$p < 0.001$
message m_1	0.55 (0.03)	0.71 (0.02)	0.73 (0.02)	0.66 (0.03)	$p = 0.561$	$p = 0.001$	$p < 0.001$
Competition							
message m_0	0.34 (0.02)	0.24 (0.06)	0.25 (0.02)	0.22 (0.02)	$p = 0.680$	$p = 0.757$	$p = 0.078$
message m_1	0.56 (0.04)	0.75 (0.04)	0.68 (0.02)	0.51 (0.03)	$p = 0.005$	$p < 0.001$	$p < 0.001$

Notes: The first column records average cutoffs reported by buyers for each message, $\omega'(m_i)$, which is the highest disappointment sensitivity for which a buyer is willing to purchase the product that comes with message m_i. The second and third columns, $z^B(m_i)$ and $z^S(m_i)$, are buyers' and sellers' beliefs for message m_i. The fourth column, $\Pr[q_H|m_i]$, is the likelihood that message m_i comes from the high-quality seller estimated using the actual realizations observed in each round of each block. In all cells, the robust standard errors are reported in parentheses. The last three columns report results of statistical tests comparing buyers' and sellers' beliefs (fifth column), buyers' beliefs and the average actual frequency of high-quality sellers for different messages (sixth column), and sellers' beliefs and the average actual frequency of high-quality sellers for different messages (seventh column).

Figure 6: Buyers' Beliefs about Message m_1, first two blocks of the experiment



Notes: The cumulative distribution of buyers' beliefs for message m_1 in the first 2 blocks of the experiment are presented.

6 Belief Updating Model for Buyers

We consider a simple belief-updating learning task of a buyer, in which we show the rationale behind the slow adjustment of beliefs in markets with competition compared to the markets with no competition. This sluggishness in beliefs reflects the slower response to feedback observed in the experiment.

Consider a buyer who believes that any seller with a high-quality product sends message m_1, any seller with type $(q_L, 0, 0)$ sends message m_1, any seller with type $(q_L, 0, L)$ or (q_L, G, L) sends message m_0, and any seller with type $(q_L, G, 0)$ sends message m_0 with probability $\mu \in (0, 1)$. Such a buyer will observe the quality of the good she purchased in the experiment and will update her beliefs about the strategy (strategies) used by a seller with a type $(q_L, G, 0)$, arriving at posterior probability μ'.

No Competition Market. The buyer's belief about the seller's strategy determines the likelihood that the m_1 message indicates a high-quality seller. Before any information arrives, this quantity can be written as

$$z^B(m_1) = \Pr[q_H|m_1] = \frac{1-p}{1-p+p\left(\frac{1}{4}+\frac{1-\mu}{4}\right)} = \frac{8}{14-3\mu}.$$

We will consider how such a buyer updates her beliefs if she happens to purchase a low-quality product after observing the m_1 message. Recall that our experimental buyers learn the quality of the purchased goods at the end of each round, so the scenario above is plausible. In the event above, the buyer will update her belief about μ downward, resulting in the posterior belief μ', which summarizes the chance that the seller's type $(q_L, G, 0)$ is truthful. Using the Bayes' rule, this new posterior belief μ' can be written as

$$\mu' = \frac{\mu \cdot \frac{1}{4}}{\mu \cdot \frac{1}{4} + (1-\mu) \cdot \frac{1}{2}} = \frac{\mu}{2-\mu} < \mu,$$

which means that the trustworthiness of message m_1 becomes

$$z^B_{\text{No Comp}}(m_1) = \frac{8}{14-3\mu'} = \frac{8}{14-3\cdot\frac{\mu}{2-\mu}}.$$

Market with Competition. In a market with two sellers, a buyer initially holds the same beliefs about both sellers. These beliefs are the same as beliefs about the single seller in the market without competition specified above. In other words, the buyer believes that high-quality sellers are truthful, type $(q_L, 0, 0)$ lies, type $(q_L, G, 0)$ is truthful with probability μ, i.e., $\mu_{S_1} = \mu_{S_2} = \mu$, and both types $(q_L, 0, L)$ and (q_L, G, L) are truthful.

The buyer observes feedback at the end of each round and uses Bayes' rule to update her beliefs about the chances that sellers with type $(q_L, G, 0)$ are truthful. Note, however, that when a buyer purchases a product, she only observes the quality of the product she chose to buy. She receives no information regarding the quality of the other seller's product. This lack of information is what causes a slower response to information in competitive markets.

In a similar scenario to the one discussed earlier, imagine a buyer who receives two m_1 messages, selects seller S_1, and purchases a good from this seller. The purchased good turns out to be of low quality. Given this information, the buyer updates her beliefs about the seller S_1, but not about the seller S_2, i.e.,

$$\mu'_{S_1} = \mu' = \frac{\mu}{2-\mu} < \mu = \mu'_{S_2}.$$

The last equality is due to the fact that the buyer does not learn anything new about the other seller S_2, since she has not purchased his product. As a result, when asked about her average assessment of the likelihood that message m_1 indicates a high-quality product, she reports the average quantity across two sellers, i.e.,

$$z^B_{\text{Comp}}(m_1) = \frac{1}{2} \cdot \frac{8}{14 - 3\mu'_{S_1}} + \frac{1}{2} \cdot \frac{8}{14 - 3\mu'_{S_2}} > z^B_{\text{No Comp}} = \frac{8}{14 - 3\mu'}.$$

That is, the buyer's beliefs respond slower in the markets with competition relative to the markets without competition given the same feedback.

7 Welfare Decomposition

We calculate the extent to which the welfare reduction in the markets with psychological payoffs due to competition is driven by players' miscalibrated beliefs, which determine psychological costs, versus players' strategies, which determine the frequency and the quality of trade. We focus on the last 5 blocks of the experiment and use players' strategies and beliefs reported in Tables 3 and 6 in the main manuscript to perform these calculations.[5] Table 5 summarizes all values used in this exercise for convenience.

We start with the welfare of buyers. The expected payoff of the buyer is equal to

$$\mathbb{W}^B = \sum_{m_i \in \{m_0, m_1\}} \Pr[m_i] \cdot \Pr[\text{Buy}|m_i] \cdot \Big(\Pr[q_H|m_i] \cdot 10 + \Pr[q_L|m_i] \cdot \big(-10 z^B(m_i) \mathbb{E}[\omega|m_i, \text{Buy}]\big) \Big) + \sum_{m_i \in \{m_0, m_1\}} \Pr[m_i] \cdot \Pr[\text{Not Buy}|m_i] \cdot 5.$$

[5]As we will see momentarily, in a few cases, the average players' payoffs calculated in this section differ slightly from those reported in Table 2 in the main manuscript. The discrepancy comes from the difference between observed and expected values given specified strategies, which happens in categories with a small number of observations. For instance, the reported average payoff of buyers is 3.80 in the Competition treatment (Table 2), while the one we calculate here is 4.05. This is because the average observed buyers' disappointment sensitivity after purchasing the goods that came with the m_0 label was higher than the average sensitivity calculated from buyers' reported purchasing cutoff for the m_0 message. The discrepancy is not surprising since there is a small number of observations that fall into this category. A similar reason explains the higher sellers' payoff in the Competition treatment reported here (4.19) compared to the one reported in Table 2 (3.17). The qualitative results of the decomposition do not change if we use observed values for all quantities required to calculate buyers' and sellers' payoffs instead of calculating them from the reported strategies.

Given players' strategies and beliefs summarized in Table 5 below, we calculate the buyers' payoffs in the two treatments and obtain $\mathbb{W}^B_{\text{No Comp}} = 4.66$ and $\mathbb{W}^B_{\text{Comp}} = 4.05$.

The introduction of competition decreases buyers' payoffs via two channels. First, buyers incorrectly interpret messages in the markets with competition, which leads them to experience higher disappointment costs. Second, the sellers lie more often in the markets with competition, which negatively affects the quality of the traded goods. To estimate the relative magnitude of these two channels, we calculate what would be the buyer's expected payoff in the Competition treatment if she had correct beliefs about the messages' meaning, i.e., $z^B(m_1) = 0.49$ and $z^B(m_0) = 0.17$, while holding fixed all players' strategies.[6] Her average payoff in this case would have been $\mathbb{W}^B_{\text{Comp}} = 4.13$. Thus, less than 15% of the buyer's welfare reduction in the presence of competition is due to her miscalibrated beliefs, i.e., $13\% = \frac{4.13-4.05}{4.66-4.05}$. The main driver of the buyer's welfare reduction, more than 85%, is due to inefficient trade.

Consider now the welfare of sellers. The expected payoff of the seller in the No Competition game is equal to

$$\mathbb{W}^S_{\text{No Comp}} = \sum_{t^S \in T^S} \Big(\Pr[m_1|t^S] \cdot \mathbb{W}^S(\cdot|m_1, t^S) + \Pr[m_0|t^S] \cdot \mathbb{W}^S(\cdot|m_0, t^S) \Big).$$

In the Competition treatment, however, there is an additional tension that comes from the fact that the buyer chooses only one of the sellers to deal with and the other seller gets zero payoff. Thus, the expected payoff of the seller is equal to

$$\mathbb{W}^S_{\text{Comp}} = \sum_{t^S \in T^S} \Big(\Pr[m_1|t^S] \cdot \Pr[\text{win}|m_1] \cdot \mathbb{W}^S(\cdot|m_1, t^S) + \Pr[m_0|t^S] \cdot \Pr[\text{win}|m_0] \cdot \mathbb{W}^S(\cdot|m_0, t^S) \Big),$$

where $\Pr[\text{win}|m_i]$ denotes the probability that the seller who sent message m_i was selected by the buyer; this probability depends on the message sent by the other seller. The above expression omits the term denoting the seller's payoff when he is not selected since this payoff is zero.

We compute the sellers' payoffs using observed strategies and beliefs summarized in Table 5 and obtain $\mathbb{W}^S_{\text{No Comp}} = 8.87$ and $\mathbb{W}^S_{\text{Comp}} = 4.19$.

There are three main reasons why sellers' expected payoffs are lower in the Competition treatment compared with the No Competition treatment. First, the presence of competition reduces the chance that an individual seller is successful at trade, given that the buyer selects only one of the sellers to deal with and the other, non-selected seller, gets a zero payoff. Second, as we documented in Section 4.3, sellers lie more often in markets with competition, which means some seller types incur higher psychological costs from doing so compared to the markets without competition. Third, as we discussed in Section 5, sellers' beliefs about buyers' interpretation of messages match those of the buyers, but buyers' interpretation of the m_1 message is exaggerated relative to what sellers do in this market. This results in some sellers suffering higher guilt cost relative to what they would have suffered if buyers held correct beliefs.

[6] That is, the only change relative to what we observe in the Competition treatment are the buyer's beliefs, which determine her disappointment payoff.

It turns out that the first reason, i.e., the competition between sellers, is the main driver of the reduction in sellers' welfare. Holding fixed players' strategies and sellers' beliefs as they are in the Competition treatment, we calculate that sellers would have earned $\mathbb{W}^{S}_{\text{Comp}} = 8.57$ if they were not facing the competition from another seller. In other words, $94\% = \frac{8.57-4.19}{8.87-4.19}$ of the reduction in sellers' welfare is driven by the competition with another seller. The remaining reduction is due to higher guilt costs associated with incorrect buyers' beliefs and, as a result, higher guilt costs paid by some types of sellers, and the excessive lying and, as a result, higher lying costs paid by some types of sellers.

Table 5: Values used in Welfare Decomposition, last 5 blocks

	No Competition	Competition	
$\Pr[m_1]$	0.50	0.74	Table 3
$\Pr[m_1 \mid (q_H, \cdot, \cdot)]$	0.90	0.89	Table 3
$\Pr[m_1 \mid (q_L, \cdot, \cdot)]$	0.24	0.63	Table 3
$\Pr[m_1 \mid (q_H, 0, 0)]$	0.82	0.93	Figure 4
$\Pr[m_1 \mid (q_H, G, 0)]$	0.93	0.97	Figure 4
$\Pr[m_1 \mid (q_H, 0, L)]$	0.96	0.99	Figure 4
$\Pr[m_1 \mid (q_H, G, L)]$	0.92	0.98	Figure 4
$\Pr[m_1 \mid (q_L, 0, 0)]$	0.50	0.77	Figure 4
$\Pr[m_1 \mid (q_L, G, 0)]$	0.31	0.57	Figure 4
$\Pr[m_1 \mid (q_L, 0, L)]$	0.05	0.28	Figure 4
$\Pr[m_1 \mid (q_L, G, L)]$	0.04	0.13	Figure 4
$\Pr[\text{Buy} \mid m_1]$	0.56	0.65	Table 3
$\Pr[\text{Buy} \mid m_0]$	0.32	0.34	Table 3
$\Pr[\text{win} \mid m_1]$		0.57	observed
$\Pr[\text{win} \mid m_0]$		0.37	observed
$\Pr[q_H \mid m_1]$	0.71	0.49	Table 3
$\Pr[q_H \mid m_0]$	0.07	0.17	Table 3
$\mathbb{E}[\omega \mid m_1, \text{Buy}] = \frac{1}{2}\bar{\omega}(m_1)$	0.30	0.31	Table 6
$\mathbb{E}[\omega \mid m_0, \text{Buy}] = \frac{1}{2}\bar{\omega}(m_0)$	0.15	0.16	Table 6
$(z^S(m_0), z^S(m_1))$	(0.20,0.73)	(0.25,0.70)	Table 6
$(z^B(m_0), z^B(m_1))$	(0.26,0.76)	(0.22,0.77)	Table 6

Notes: This table records characteristics of buyers' and sellers' strategies used in the decomposition exercise. The last column lists the place in the main manuscript, where these values are reported.