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Brosig-Koch, Jeannette and Heinrich, Timo and Sterner, Martin

Otto von Guericke University Magdeburg, Hamburg University of Technology

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Jeannette Brosig-Koch†, Timo Heinrich‡, and Martin Sterner§

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We ask how buyers can make use of bilateral communication in a procurement setting with moral hazard. We focus on a setting where buyers and potential sellers can exchange cheap-talk messages before trading and where the seller is determined via a buyer-determined procurement auction. In this type of auction, buyers can freely choose among bidders based on bidders' observable characteristics and the prices they ask for. In a controlled laboratory experiment, we find that buyers use free-form text messages to make requests and to reduce social distance. The relationship between the offers sellers make and the messages they send is mediated by buyers' requests. But, in general, buyers may increase their profits by choosing sellers who promise high quality or large profits. Furthermore, despite the cheap-talk nature of requests, buyers in our experiment increase their profits by specifically demanding high quality or large profits.

JEL Codes: D44, D83, C91

Keywords: procurement auctions, bilateral communication, social distance, promises, requests, moral hazard

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† Otto von Guericke University Magdeburg; email: jeannette.brosig-koch@ovgu.de.

‡ Hamburg University of Technology; email: timo.heinrich@tuhh.de (corresponding author).

§ Hamburg University of Technology; email: martin.sterner@tuhh.de.

1 Introduction

Procurement costs comprise a large part of the expenses of most businesses and organizations. Thus, not surprisingly, it is often advocated to procure goods and services competitively (see, e.g., the discussions on procurement in the handbook by Dimitri et al., 2006, or on business-to-business markets in the reviews by Haruvy and Jap, 2012, 2022). Even though the introduction of procurement auctions may be detrimental to buyer–supplier relationships, as described, for example, by Jap (2002, 2007), many software vendors include tools for standardized competitive procurement processes, and online labor markets and platforms for the procurement of services are growing in popularity.[1] Moral hazard is a common issue in such procurement settings. After the buyer has selected the bidder winning the auction, the transaction partner often has an incentive to deliver a lower quality or lower level of effort than the buyer prefers to receive. This is because providing high effort or quality is costly for the seller, while it is difficult for the buyer to specify all aspects of quality and effort in the contract or to enforce them.

In this paper, we focus on the informal communication that occurs before transaction partners are selected. According to a recent industry survey of professionals involved in business-to-business procurement, the number of buying interactions and the share of buyers who found human interactions valuable have increased by almost 60% after the pandemic (Forrester, 2022). Most theoretical and empirical research on procurement ignores the informal communication taking place in such relationships. Based on a controlled laboratory experiment, we try to shed light on how buyers *do* use communication and how they *should* use it in order to increase their profits.[2] We focus on a bilateral communication setting, where bidders can reply to the messages sent by buyers, when placing a bid.

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[1] Software provider SAP (2023), for example, offers procurement tools that allow buyers to conduct a variety of procurement or "reverse" auctions. Furthermore, in 2014 SAP (2014) acquired the platform Fieldglass to support the procurement of services. More generally, freelance work is becoming more and more common. A recent survey of professionals in the US, commissioned by Upwork (2022), concludes that the share of the US workforce that has performed freelance work in the past year rose from 36% to 39% from 2021 to 2022. Another survey by the consulting firm McKinsey (2022) claims that 36% of employed respondents in the US identify as independent workers, which includes gig workers and freelancers, compared to 27% in 2016.

[2] We believe that these are highly relevant questions in any market setting in which requirements are communicated to bidders before competitive bidding takes place (i.e., in a project description or an RFQ document).

From a game-theoretic perspective, communication may help players to coordinate among different equilibria of a game. In the presence of moral hazard, however, communication is cheap talk and does not influence behavior because agents have opposing interests (see Crawford ,1998, for a summary of the theoretical results). Yet, a large body of empirical research in business studies and economics shows that cheap-talk communication can be highly influential. It has been found that bilateral communication can increase the efficiency of outcomes in a number of settings, such as bilateral bargaining (see, e.g., Roth, 1995) and multilateral bargaining (see, e.g., Bolton & Brosig-Koch, 2012) or social dilemmas like the public good game (see, e.g., Brosig et al., 2003) and the prisoner's dilemma game (see, e.g., He et al., 2017). Similar results have been found, for example, with respect to information sharing in supply chains (see, e.g., Inderfurth et al., 2013; Özer et al., 2011). Thus, we conjecture that bilateral communication is also crucial for buyer–supplier relationships in procurement auctions.

Procurement auctions can sometimes be run as multi-attribute auctions that exclusively depend on pre-defined parameters such as prices, lead times, or service levels.[3] Yet, often it is not possible or desirable to specify selection rules *ex ante*, for example, because certain parameters cannot be legally enforced or because buyers are uncertain about their preferences at the time of awarding the contract. Following Engelbrecht-Wiggans et al. (2007), we refer to auctions in which buyers can choose freely between competing bidders based on prices and all other information available as "buyer-determined procurement auctions." This type of procurement auction is frequently used in the public and private sectors as well as on online labor markets, as summarized by Jap (2007), Haruvy and Katok (2013), and Haruvy and Jap (2022).[4]

These may vary along many dimensions, for example in the style in which they are formulated or in the requirements for bidders that are explicitly or implicitly mentioned. Of course, buyers and bidders may also communicate via additional channels. Procurement platforms typically implement further communication options. SAP Fieldglass, for example, allows the buyer to chat with potential candidates applying for advertised projects (SAP, 2021). Platforms like Upwork (2023) and Fiverr (2023) also support direct messages of potential workers.

[3] See, e.g., Chen-Ritzo et al. (2005) for an experimental study of such multi-attribute auctions.

[4] A small but growing literature analyzes behavior in buyer-determined procurement auctions under controlled conditions. Buyer-determined auctions without moral hazard (i.e., with exogenously determined quality) have been studied experimentally by Shachat and Swarthout (2010), Haruvy and Katok (2013), and Fugger et al.

In this paper, we build on the work of Brosig-Koch and Heinrich (2018), who focus on the content of messages that are sent unilaterally by *sellers* in buyer-determined procurement auctions with moral hazard. They focus on the choices buyers make when selecting a bidder in buyer-determined procurement auctions.[5] They find that buyers in a laboratory experiment are able to realize most of the potential profits when sellers can make specific promises about the profit they will deliver. Accordingly, buyers in the lab prefer bidders who make specific promises. In the field, where specific promises are infeasible, buyers prefer messages reducing social distance. The same holds for the laboratory environment if specific promises are prohibited.[6]

In the same spirit, we now focus on three prominent factors that may drive the observed influence of communication on behavior, but focus on a setting where buyers can send messages as well. The first factor is that communication allows agents to reduce *social distance*. Reducing social distance could make others' payoffs more salient and is put forward, for example, to explain varying donations in dictator games (see, e.g., Charness & Gneezy, 2008).[7] The second factor is that communication often contains (non-binding) *promises*. In trust games, for example, trustees' promises to return money lead first movers to increase their investments. This effect can, for example, be attributed to guilt aversion (Charness &

(2016). Cox et al. (1996) and Onderstal and Van de Meerendonk (2009) focus on auctions of incentive contracts in settings with moral hazard. Auctions of fixed-price contracts with moral hazard have been studied by Brosig-Koch and Heinrich (2014, 2018), Fugger et al. (2019), and Walker et al. (2022, 2023). Another common practice in case not all information is available when conducting the auction is to make it possible to renegotiate terms after the seller selection. These auctions have been studied experimentally by Chang et al. (2016), for example. However, none of these studies considers bilateral communication.

[5] See Brosig-Koch et al. (2022) for a related study focusing on patients' choice of a physician.

[6] Brosig-Koch and Heinrich (2018) also find that buyers prefer bidders with better reputation. In the present study, however, we do not consider reputation but focus solely on bilateral communication. Buyers have been found to prefer bidders with better reputation in buyer-determined procurement auctions from several online procurement platforms (Heinrich, 2012; Lin et al., 2018; Stoll & Zöttl, 2017; Strunk et al., 2022; Yoganarasimhan, 2013). Spagnolo (2012) reviews the research on reputation in public procurement.

[7] Related evidence for the importance of social distance is found in studies on the selection of partners for playing a trust game. Eckel and Wilson (2004) find that first movers in the trust game prefer to play with second movers who are labeled with a friendly facial icon. Fiedler et al. (2011) find that in the laboratory as well as in a virtual community, first movers in the trust game prefer to play with second movers they can communicate with. In the virtual community, the likelihood of choosing someone increases in the number of emoticons and acronyms used in a pre-game chat.

Dufwenberg, 2006) or a preference for promise keeping *per se* (Vanberg, 2008).[8] In the procurement setting with moral hazard, it will be the sellers who can make promises. The buyers, however, will be able to make *requests*, which is the third factor we consider. As Ellingsen and Östling (2010) point out, already Myerson (1989) "*emphasizes that cheap talk can communicate both own intended actions ('promises') and desires about others' actions ('requests')*" (p. 1695). Requests can influence behavior through the same behavioral channels as promises. For example, in a procurement setting, buyers who communicate higher expectations may increase feelings of guilt in sellers who deliver low quality. Yet, the effects of requests reported in the literature are ambiguous. Most informative for our setting is an experimental study by Ismayilov and Potters (2017). They consider messages sent by first movers to second movers in the trust game. They find that first movers tend to send requests to second movers by asking them to make a promise or by asking them to cooperate. Overall, making these requests improves outcomes for first movers. Yet, these requests do not influence promise keeping by second movers.[9]

In our experiment, we combine a buyer-determined procurement auction with a structured communication channel. This will enable us to identify the causal effects of buyers' messages on their realized profits without enforcing certain communication content *ex ante*. In our setting, buyers can send a free-form text message to bidders before bidders place their bids. Bidders then choose the (costly) quality they want to deliver and the price they demand. They can combine their bid with a free-form text message. The buyer is then informed about the prices the bidders demand and also receives their messages, but does not learn about their quality choices. To capture the moral hazard setting we are interested in, buyers only learn about the actual qualities delivered at the end of the experiment. We then classify the

[8] As summarized in the comprehensive study on truth-telling by Abeler et al. (2019), other relevant factors that may drive promise-keeping are reputational concerns, lying costs, or social norms.

[9] Evidence from dictator and ultimatum games corroborates the observation that the effect of requests is not clear cut and depends on the strategic environment. In dictator games without strategic interaction, the amount shared with recipients greatly increases when they are given the opportunity to make requests, as Charness and Rabin (2005), Rankin (2006), Mohlin and Johannesson (2008), and Andreoni and Rao (2011), among others, report. In ultimatum games, where suggested splits may be rejected by responders, Rankin (2003) observes that requests made by responders are positively correlated with offers made by proposers. However, overall requests result in lower offers, more rejections, and lower payoffs for responders (see also Brunner & Ostermeier, 2018; Ong et al., 2012; Zultan, 2012).

communication content along the lines described above in order to analyze its effect on the potential and realized profits of buyers.

Closely related to our study are two experimental papers that consider communication in procurement auctions. The first study by Onderstal and Yang (2020) considers communication in procurement auctions theoretically and experimentally. They do not focus on bilateral communication or moral hazard. In their setting, buyers' profits and sellers' costs depend on a location choice made by the buyer and on sellers' independently drawn costs. The buyer chooses the location after the auction. However, only the bidders know which location generates the highest profit for the buyer. Depending on the setting, sellers can send a message to the buyer recommending a position before or after the auction. The authors also vary whether the preferences for a position are aligned between the buyer and the bidders. The authors' theory suggests that bidders should communicate the optimal location after the auctions in the case of aligned preferences and before the auctions in the case of misaligned preferences. In the experiment, they observe that — in line with the prediction — information about the buyer's optimal location is revealed in the messages sent after the auctions of the aligned case. Yet, contrary to the prediction, the messages sent before the auctions of the misaligned case do not reveal any information to the buyer.

The second experimental study by Brosig-Koch et al. (2023) is complementary to the one presented here. They also analyze requests in buyer-determined auctions with moral hazard experimentally, but restrict communication to numerical quality requests by buyers. They vary whether buyers can fix qualities by making a binding request or whether requests are cheap talk and, thus, non-binding. They observe that non-binding requests are more efficient than suggested by standard theory because they are positively correlated with the actual quality delivered by sellers. Nevertheless, when buyers have a choice between binding and non-binding requests, they would benefit from choosing the complete contract more often.[10]

[10] Two insightful studies using data from online platforms for the procurement of services are also related to our work. The first study by Strunk et al. (2022) considers the selection of potential contractors who bid on projects. They find that not only lower prices and better reputation improve a bidder's likelihood of winning but in most fields of work, buyers also favor bidders who match the skill set they requested. The second study by Ludwig et al. (2022) analyzes project descriptions and texts accompanying bids of potential contractors. They observe that buyers receive more bids when providing a moderate degree of task information, avoid sharing personal information, and limit the affective intensity of their communication. Bidders are more likely to be

After presenting our experimental design in detail in the following section, we organize our presentation of the results in Section 3 around three research questions. First, we ask: *What kind of messages do buyers send?* This question aims to investigate whether buyers send messages and, if so, whether they can be classified as reducing social distance or as eliciting promises by making requests. Second, we ask: *What kind of messages can buyers trust?* Even though the messages bidders send are cheap talk, it is an open empirical question whether they contain information that is valuable to buyers. Therefore, we analyze whether buyers should trust certain messages received from bidders conditionally on the requests they have made themselves. Third, we ask: *What kind of messages should buyers send?* Even though more attractive offers may be paired with certain messages, empirically it is not obvious whether buyers are able to realize these additional returns conditional on the actual selection rules they apply when selecting a seller. They may be ignorant of the information content of messages or unwilling to act upon this information. Thus, we also analyze which kinds of messages sent by buyers actually lead them to realize higher profits. Section 4 concludes and highlights the limitations and managerial implications of our work.

selected as winners when they mimic buyers' degree of task information and affective intensity. Because valuations, costs, and quality are unobservable in the field, however, it is not straightforward to derive recommendations for buyer communication from the two papers. Furthermore, in a theoretical paper, Ke and Zhu (2021) show that, in their setup, it is always an equilibrium for buyers to include truthful quality preferences in their project descriptions when they cannot renegotiate with contractors on their prices after selecting them.

2 Methods

2.1 Experimental design

Subjects play a buyer-determined procurement auction game with sealed bids, independent private costs, and moral hazard. In the auction game, two bidders $i \in \{1, 2\}$ compete to sell a project to a buyer. The buyer values the project with $v = 500$. When making their bid, bidders know about their own private costs c_i that are drawn independently from a uniform distribution with support $[100, 500]$. Bidders cannot bid prices above 500, as this is the buyer's valuation of the project.

A bidder winning an auction has the opportunity to reduce his costs at the expense of the buyer by delivering a lower quality level. However, the chosen quality is unobservable to the buyer when selecting the bidder winning the auction. This is reflected by the quality factor $q_i \in [0.5, 1]$ selected by bidders. It is multiplied by the winning bidder's cost c_i and the buyer's valuation $v = 500$ to determine payoffs: The winning bidder (i.e., the seller), having submitted the winning bid b_i, earns a profit of $\pi_S = b_i - q_i c_i$. The losing bidder earns a profit of zero, while the buyer earns a profit of $\pi_B = q_i v - b_i$. Standard theory predicts that a quality factor q_i of 0.5 will be selected and bids will be made according to the Nash equilibrium under risk neutrality. That means the bidding function is given by $\beta(c_i) = 125 + c_i/4$, and the buyer and seller each earn a profit of $\pi_B = \pi_S = 125 - c_i/4$ per auction. Under the assumptions of common knowledge of rationality and selfishness, the same is expected in the finitely repeated version of the game. If we relax these assumptions, several equilibria may emerge, in which subjects choose above-minimum quality.

The design of our experiment directly builds on the design used by Brosig-Koch and Heinrich (2018), adjusted to enable bilateral communication. Importantly, before bidders submit their bids, buyers can compose a text message. This message is shown to bidders when they enter their bid prices, their quality choices, and their own text message.[11] When deciding between the two bidders, buyers are shown their own message, the respective bid prices, and each bidder's message. During the experiment, the content of the messages was left up to the

[11] Note that we applied the strategy method for eliciting quality choices: Bidders always submitted a quality choice irrespective of whether they won an auction. This design choice will also facilitate our analysis of profits sellers hypothetically offer to buyers in Section 3.3.

subjects but was limited to 420 characters. Subjects were prohibited from disclosing information with which they could be identified.

The auction game described above was played repeatedly for 18 rounds (which subjects were informed about). In total, 72 subjects participated in the experiment. Participants were divided into eight matching groups (yielding eight independent observations). Within each matching group, three subjects acted as buyers and six subjects as bidders and kept these roles throughout the experiment. Subjects were randomly re-matched after each auction round, in each of which one buyer faced two sellers. Subjects knew that they were re-matched within their matching group after each round and that no buyer would meet the same pair of bidders in two consecutive rounds. There were six series of randomly drawn costs, one for each bidder of a matching group. Each matching group faced the same set of costs to make the observations straightforwardly comparable.[12]

The sessions took between 90 and 120 minutes and were conducted at the Essen Laboratory for Experimental Economics (elfe), University of Duisburg-Essen, Germany, using z-Tree (Fischbacher, 2007). The profits mentioned above are given in euro cents, and subjects were paid the sum of their earnings in cash upon leaving the laboratory. They earned euro 19.54 on average. Payments include euro 5.00 for completing a post-experimental questionnaire. Before the start of the first round, subjects participated in a computerized test of understanding. They were asked to determine the buyer and seller profits in an example of their choice (i.e., they first had to choose three numbers representing the cost, the quality, and the price themselves). All participants were able to complete this task correctly. The subjects were students of different disciplines recruited using ORSEE (Greiner, 2015), such that about half of the subjects in every matching group were students of business or economics. The

[12] Before entering the main experimental stage described above, subjects complete a training stage that is identical to the one used by Brosig-Koch and Heinrich (2018). The training stage allows subjects to become familiarized with the auction procedures before participating in the experimental stage. Subjects do not learn about the outcome of the training stage before the end of the main experimental stage. Any earnings from the training stage are added to the payments from the experiment. See Heinrich and Walker (2022) for an analysis of the training data. The data reveal the presence of overly aggressive bidding that has been commonly observed in first-price procurement auctions (see, e.g., Brosig & Reiss, 2007) and standard first-price auctions (see, e.g., Haruvy et al., 2022).

Appendix includes an English translation of the instructions that were available to the subjects during the experiment.

2.2 Classification of messages

In classifying the messages buyers and sellers sent in our experiment, we focus on three aspects that have been widely studied in experimental research on communication, namely *social distance*, *promises*, and *requests* (see Brandts et al., 2019, for a recent survey). Table 1 summarizes the classification scheme and the resulting indicator variables, which we use in our analyses. For buyers and bidders, we identify empty messages and messages that create social proximity. For the latter category, we look for smileys or emoticons, as they have been shown to influence behavior in related games (e.g., Eckel & Wilson, 2004; Fiedler et al., 2011). We also classify messages that use informal German pronouns as creating social proximity. Social distance appears to be the most important factor in selecting formal or informal second-person pronouns in German, as Kretzenbacher et al. (2006) observe.

With respect to the messages bidders sent, we also consider promises, which have been found to affect behavior in related games (see, e.g., Charness & Dufwenberg, 2006; Vanberg, 2008). As Brosig-Koch and Heinrich (2018) have found different effects for specific and unspecific promises, we consider them separately. So far, the classification of messages sent from bidders to buyers — henceforth referred to as seller messages (*SM*) — resembles the one described by Brosig-Koch and Heinrich (2018). However, we deviate from Brosig-Koch and Heinrich (2018) by also considering a more granular definition of specific promises. For this purpose, we apply a median split to our specific promise variable based on the profits offered in our sample overall.[13]

For the messages sent from buyers to bidders — henceforth buyer messages (*BM*) — we consider requests, rather than promises. They appear to be a natural choice for buyers who face a setting with moral hazard on the seller side. Requests have commonly been used as a

[13] Specific promises made by bidders can relate to either profits or quality. Before conducting the median split, promises relating to quality are converted to profits based on the bidder's price bid. Our regression analyses in Sections 3.3 will show that, based on Akaike's information criterion (AIC) and on the Bayesian information criterion (BIC), models including the more granular definition are preferable to models only considering specific promises *per se*.

category when classifying communication in related games (e.g., Ismayilov & Potters, 2017; Rankin, 2003). To mirror the classification on the seller side, we also investigate specific and unspecific requests. In addition, we also consider low and high specific requests separately.[14]

We also follow the procedures described by Brosig-Koch and Heinrich (2018) when classifying messages. Empty messages were coded automatically, while the remaining categories were independently coded by two research assistants. Once the classification scheme had been defined, the research assistants were trained on a random sub-sample of messages. Based on this sub-sample, any remaining questions about the classification scheme were resolved in a joint meeting with one of the authors. During this meeting, examples were selected to serve as a reference for the coders during the classification process. In total, the research assistants coded 1,077 non-empty messages. To check the inter-coder reliability (i.e., the extent to which the two independent coders came to identical conclusions about the message contents), we calculated Krippendorff's Alpha (Hayes & Krippendorff, 2007; Krippendorff, 1980). The calculated reliability scores for all of the categories except one pass the 0.70 cutoff value proposed by Krippendorff (1980). For the unspecific promises made by sellers (*SM: Unspecific promise*), we calculate a score of 0.673. We nevertheless include them in the following because the score is just below the cutoff and has been reliably coded in the treatments presented by Brosig-Koch and Heinrich (2018). Note that non-empty messages could fall into multiple categories (or into none). If the two coders did not agree on how to code a particular message, the above-mentioned indicator variables take a value of 0.5.

[14] Specific requests made by buyers can relate to either profits or quality. As bid prices are unknown at the time the request is made, requests cannot be converted into one metric. Therefore, the median split is conducted separately for profit and quality requests.

Table 1 – Indicator variables for classification of communication content

Buyer messages (*BM*)		Seller messages (*SM*)	
Indicator	Content	Indicator	Content
BM: Specific request	Contains quantifiable information about the profit that the buyer requests directly by referring to the buyer's profit or indirectly by referring to the delivered quality.	*SM: Specific promise*	Contains quantifiable information about the profit that the bidder promises to deliver directly by referring to the buyer's profit or indirectly by referring to the delivered quality.
BM: Unspecific request	Contains an unspecific (or unquantifiable) request regarding profit or quality.	*SM: Unspecific promise*	Contains an unspecific (or unquantifiable) promise regarding profit or quality.
BM: Social proximity	Reduces social distance by addressing bidders using informal pronouns like the German "Du" or usage of emoticons like smileys.	*SM: Social proximity*	Reduces social distance by addressing buyers using informal pronouns like the German "Du" or usage of emoticons like smileys.
BM: Empty message	No message was sent.	*SM: Empty message*	No message was sent.
BM: High request	Contains a specific request for a profit that is higher than the median profit request made by all buyers of 200 euro cents or the median quality request made by all buyers of 87%.	*SM: High promise*	Contains a specific promise for a profit that is higher than the median profit promise made by bidders of 126 euro cents.
BM: Low request	Contains a specific request for a profit that is lower than or equal to the median profit request made by all buyers of 200 euro cents or the median quality request made by all buyers of 87%.	*SM: Low promise*	Contains a specific promise for a profit that is lower than or equal to the median profit promise made by bidders of 126 euro cents.

3 Results

3.1 Summary statistics

Table 2 presents the summary statistics of the data from our experiment split by the indicator variable for buyer message types from Table 1. In the last row, we also present the aggregate data on bids, quality choices, and realized buyer and seller profits.

As a first look at our data, we compare the quality choices to the standard theoretical prediction, based on which sellers' quality choices should not exceed 50% (in other words, $q_i = 0.5$). Based on matching group averages, we find that chosen qualities on aggregate are significantly above the benchmark ($p = 0.008$, two-sided one-sample Wilcoxon test). We also compare the quality choices to quality choices of 100% ($q_i = 1.0$). This quality level would be implemented if quality was fully contractable. However, quality falls significantly below this (somewhat optimistic) benchmark ($p = 0.008$).

We conduct the same benchmark comparisons for the remaining aggregates shown in Table 2. For these comparisons, we assume that the quality choices are common knowledge and winning bidders are selected solely based on their bid prices. On aggregate, sellers' bids are significantly above the 50% benchmark and significantly below the 100% benchmark ($p = 0.008$). Seller profits are significantly above the 50% benchmark ($p = 0.008$) but do not significantly differ from the profits a bidder would make if consistently choosing 100% quality ($p = 0.109$). Buyer profits also fall below the 100% benchmark ($p = 0.008$) but do not differ significantly from the profits a buyer would make if bidders consistently chose 50% quality ($p = 0.250$).[15]

[15] We can also compare the variables from Table 2 to the respective treatments with unilateral communication ("C") or without communication ("Baseline") from Brosig-Koch and Heinrich (2018). Quality choices, bids, and buyer profits here are significantly higher than in the treatment without communication ($p < 0.050$, two-sided Mann–Whitney *U* tests). All the remaining comparisons yield no significant differences ($p > 0.279$).

Table 2 – Summary statistics

	Bid b_i	Quality q_i	Buyer profit π_B	Seller profit π_S	Obs.
BM: Specific request	338.92	71.47	43.54	68.85	108
	(82.50)	(20.83)	(126.99)	(85.75)	
BM: Unspecific request	330.60	72.82	74.29	52.40	136
	(89.96)	(21.44)	(126.30)	(69.08)	
BM: Social proximity	325.60	69.69	35.29	61.25	280
	(87.24)	(20.75)	(119.20)	(77.22)	
BM: Empty message	316.57	69.71	49.50	63.86	112
	(86.84)	(19.23)	(109.20)	(79.44)	
BM: High request	335.21	78.90	63.97	68.47	58
	(77.67)	(21.81)	(118.99)	(83.53)	
BM: Low request	343.22	62.86	19.84	69.29	50
	(88.38)	(15.91)	(134.19)	(89.10)	
Total	327.13	69.54	47.70	61.70	864
	(88.07)	(20.11)	(120.85)	(79.26)	

Standard deviations in parentheses.
Units of measurement: bid, buyer profit, seller profit: euro cents; quality: percent.
The number of observations for buyer profit comprises only half of the number of observations indicated in the table, as there are two bidders per buyer. Seller profit comprises the profits made by winning and losing bidders.

3.2 What kind of messages do buyers send?

We now turn to our first research question: *What kind of messages do buyers send?* To answer this question, we consider the frequencies of message types shown in Table 2. There is a total of 432 observations of buyer messages. Among them, 12.50% contain a specific request, 15.74% contain an unspecific request, 32.41% create social proximity, 12.96% are empty, 6.71% are high requests, and 5.79% are low requests. Note, however, that a message can fall into several categories simultaneously, for example, if a message includes a specific request and creates social proximity by including an emoticon. Yet, that means buyers mostly send non-empty messages (87.04%), although communication is cheap talk. Mostly, they send (specific or unspecific) requests or create social proximity. We summarize these findings as follows.

Result 1: *Buyers mostly send non-empty messages containing (specific or unspecific) requests or creating social proximity.*

For our second research question — *What kind of messages can buyers trust?* — we will also consider the messages sent by bidders. Table 3 shows the frequencies of different seller messages conditional on the different types of buyer messages. By design, each buyer message was responded to with two seller messages, as each buyer received bids and messages from two bidders at the same time. Therefore, the number of seller messages is twice the number of buyer messages.

In total, most seller messages contained specific promises (41.78%), followed by messages creating social proximity (26.74%), empty messages (18.87%), and unspecific promises (16.67%). As specific promises are the most common message content for sellers, they are also the most common form of reply: Specific requests get responded to most frequently with specific promises (48.15%). The same is true for unspecific requests (39.71%) and for buyer messages creating social proximity (37.50%). The most frequent reply to empty buyer messages, though, is an empty seller message (36.61%).

Despite the high frequencies of specific promises, there appears to be a correlation between the messages sent by buyers and bidders. Pairwise correlation coefficients between the six categories of buyer messages and the respective six categories of seller messages reveal a tendency of sellers to respond in kind. The coefficients between categories shown in the same row of Table 1 are positive and significant throughout ($p < 0.001$), with the exception of the correlation coefficient of specific requests and specific promises, which is only weakly significant ($p = 0.054$), and the correlation coefficient of high requests and high promises, which is not significantly different from zero ($p = 0.759$). Furthermore, Chi-squared tests for these matching content categories reject independence for all of them ($p < 0.013$), again with the exception of high requests and promises, for which independence cannot be rejected ($p = 0.759$).[16]

[16] More precisely: We test the contingency tables for each pairwise combination of buyer and seller message classification with the null hypothesis that the rows and columns in this table are independent.

Table 3 – Pattern of seller responses

	SM: Specific promise	*SM: Unspecific promise*	*SM: Social proximity*	*SM: Empty message*	*SM: High promise*	*SM: Low promise*	Number of seller messages
BM: Specific request	52 (48.15%)	10 (9.26%)	33 (30.56%)	20 (18.52%)	22 (20.37%)	30 (27.78%)	108 (100.00%)
BM: Unspecific request	54 (39.71%)	38 (27.94%)	39 (28.68%)	23 (16.91%)	26 (19.12%)	28 (20.59%)	136 (100.00%)
BM: Social proximity	105 (37.50%)	54 (19.29%)	95 (33.93%)	47 (16.79%)	60 (21.43%)	45 (16.07%)	280 (100.00%)
BM: Empty message	32 (28.57%)	18 (16.07%)	23 (20.54%)	41 (36.61%)	19 (16.96%)	13 (11.61%)	112 (100.00%)
BM: High request	22 (37.93%)	6 (10.34%)	24 (41.38%)	11 (18.97%)	13 (22.41%)	9 (15.52%)	58 (100.00%)
BM: Low request	30 (60.00%)	4 (8.00%)	9 (18.00%)	9 (18.00%)	9 (18.00%)	21 (42.00%)	50 (100.00%)
Number of seller messages	361 (41.78%)	144 (16.67%)	231 (26.74%)	163 (18.87%)	180 (20.83%)	181 (20.95%)	864 (100.00%)

3.3 What kind of messages can buyers trust?

Next, we analyze how the content of bidders' messages interacts with the attractiveness of their bids in order to answer the following question: *what kind of messages can buyers trust*? We do this by calculating the hypothetical profit a buyer would have realized by selecting a specific bid, henceforth referred to as "offered buyer profit." As the buyer receives only the price and the messages, but no information on the quality a bidder will deliver, she is ignorant of the profitability of specific bids. In the following, we will focus on the relationship between offered buyer profits and the different kinds of requests buyers can make. Note that the average profit per round buyers realize in our experiment is 47.70 euro cents, while the average offered profit by bidders is 20.57 euro cents. Also note that offered profits can be negative.

We run linear fixed-effects regressions with offered buyer profit as the dependent variable and the different types of seller messages (summarized in Table 1) as independent variables, while controlling for each bidder's costs.[17] The estimation results are shown in Table 4. The sample includes both bids from winning bidders and bids from losing bidders. Standard errors are clustered by matching group. We also include control variables for the first and last period.

The results from the previous section have revealed that bidders respond differently to different buyer messages. Thus, we conduct the analysis with several samples. Depending on the model, we consider the complete set of seller messages or condition on the message type a buyer sends. Furthermore, in the first set of analyses, we do not condition on the size of the promises sellers make (models [1] to [5]). That means we include *SM: Specific promise* as an independent variable, not *SM: High promise* or *SM: Low promise*. For models (2) and (3), we split the sample into profits that are offered as a response to specific requests and into profits that are offered in the remaining cases. For models (4) and (5), we split the sample based on whether buyers make unspecific requests. In the second set of analyses, we condition on the size of the promises sellers make by including *SM: High promise* and *SM: Low promise* instead of *SM: Specific promise* as independent variables (models [6] to [11]). In models (7), (8), and (9), we split the data into three sub-samples, depending on the three possible types of specific requests: high, low, and none. In models (10) and (11), we again split the sample based on whether buyers make unspecific requests.[18]

When considering the effect of specific promises *per se* (*SM: Specific promise*), we do not find any significant influence on offered buyer profits across models (1) to (5) ($p > 0.102$). Unspecific promises (*SM: Unspecific promise*), however, are associated with lower profits when buyers make high requests (model [7]): When selecting the respective bidders, buyers would reap profits that are 66.29 euro cents lower. This effect is only weakly significant ($p = 0.052$).

[17] We also run random-effects regressions and test, with the approach suggested by Mundlak (1978), whether fixed-effects or random-effects analyses are preferable. We find that fixed-effects analyses are preferable.

[18] Note that we split the data sets based on the types of buyer messages for ease of exposition. We also run models with the full set of interactions between the respective type of buyer message and all types of seller messages (not shown). We will mention the respective results below when considering the mediating effect of buyer messages on the interpretation of seller messages.

A model with a full set of interactions, however, reveals that the effect of unspecific promises on offered buyer profits is significantly smaller if a high request has been made than in the case without such a request (p = 0.012). All remaining effects of unspecific promises on offered buyer profits are insignificant (p > 0.142).

Messages creating social proximity (*SM: Social proximity*) may also be associated with lower offered buyer profits: This is the case when buyers send low requests (model [8]). When selecting the respective bidders, the profit of buyers would decrease significantly by 56.13 euro cents (p = 0.000). The effect of social proximity is insignificant in all remaining models (p > 0.525). While empty messages (*SM: Empty message*) do not yield profits significantly different from our baseline category (p > 0.121), seller messages containing high promises (*SM: High promise*) lead to significantly higher profits (p < 0.043) in a variety of cases (i.e., in models [6], [9], [10], and [11]). The estimated positive effects on buyers' profits range from 29.49 to 72.40 euro cents. Importantly, the data reveal no evidence that the effects of social proximity, empty messages, or high promises are mediated by the communication of buyers. Models including the full set of interactions do not reveal significant differences depending on the type of requests made by buyers (p > 0.348).

Furthermore, when making a low request (model [8]), buyers would significantly decrease their profits by 61.96 euro cents when selecting bidders who have sent a low promise (*SM: Low promise*, p = 0.005). A model including the full set of interactions reveals that this effect is significantly lower than when no specific requests or high requests are being made (p < 0.038).

The results highlight a consistent positive relationship between high promises sent by bidders and their offered profits. The results also reveal that the relationship between the attractiveness of offers and unspecific promises or low promises is mediated by the requests buyers make. Accordingly, we summarize our findings as follows.

Result 2: *(i) High promises by bidders are associated with higher offered buyer profits. (ii) The associations of unspecific promises, social proximity, and low promises with offered buyer profits are mediated by the requests buyers make.*

Table 4 – Linear fixed-effects regressions with offered buyer profits as dependent variable

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Sample	Full sample	*BM: Specific request = 1*	*BM: Specific request ≠ 1*	*BM: Unspecific request = 1*	*BM: Unspecific request ≠ 1*	Full sample	*BM: High request = 1*	*BM: Low request = 1*	*BM: High request ≠ 1 & BM: Low request ≠ 1*	*BM: Unspecific request = 1*	*BM: Unspecific request ≠ 1*
SM: Specific promise	21.10	7.980	24.90	44.52	14.93						
	(13.45)	(22.35)	(13.24)	(28.19)	(11.80)						
SM: Unspecific promise	5.029	-36.25	9.026	-6.048	8.421	4.571	-66.29*	-0.674	8.295	-2.518	7.525
	(6.275)	(34.84)	(5.456)	(22.73)	(7.098)	(6.534)	(24.19)	(35.68)	(5.442)	(23.73)	(7.423)
SM: Social proximity	4.870	6.366	2.160	-3.250	2.799	1.925	-12.06	-56.13***	-0.0703	-2.523	-0.808
	(7.277)	(20.83)	(10.46)	(19.46)	(8.756)	(7.219)	(26.08)	(5.571)	(10.49)	(19.27)	(8.884)
SM: Empty message	1.509	12.76	0.390	-25.46	4.147	-0.435	-31.99	-17.96	-1.578	-18.39	1.556
	(13.19)	(9.918)	(14.05)	(47.26)	(12.45)	(13.21)	(16.32)	(14.89)	(13.88)	(44.71)	(12.95)
SM: High promise						35.19**	15.48	13.55	37.46**	72.40**	29.49**
						(14.02)	(16.75)	(10.43)	(14.99)	(20.19)	(11.96)
SM: Low promise						6.747	28.82	-61.96***	11.52	27.02	-0.358
						(15.08)	(17.77)	(12.69)	(14.04)	(32.53)	(14.64)
Constant	172.7***	172.9***	170.7***	202.8***	174.6***	168.6***	216.2***	178.4***	166.8***	189.4***	170.8***
	(10.88)	(31.18)	(12.50)	(15.45)	(11.21)	(9.992)	(28.93)	(15.77)	(12.21)	(15.49)	(9.900)
Observations	864	108	756	136	728	864	58	50	756	136	728
R^2	0.506	0.615	0.497	0.543	0.518	0.513	0.694	0.802	0.503	0.559	0.525
Adjusted R^2	0.502	0.588	0.492	0.519	0.513	0.508	0.644	0.769	0.497	0.531	0.520
AIC	9690.5	1153.5	8483.9	1502.3	8127.6	9678.9	581.6	503.1	8475.8	1497.7	8116.5
BIC	9723.8	1164.2	8516.3	1516.9	8159.8	9712.2	585.7	506.9	8508.2	1512.2	8148.6

Standard errors clustered by matching group are given in parentheses. Control variables: bidders' costs, indicator variables for first and last period.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.4 What kind of messages should buyers send?

The previous section considered the profits buyers could realize when knowing more about the relationship between their own requests, the messages bidders send, and the hypothetical profits they offer. Instead of focusing on how buyers could adjust their choice rules, however, we now turn to another straightforward question. Namely, given the choice rules they are already applying, *what kind of messages should buyers send?* In other words, we now analyze which type of messages sent by buyers yields greater profits in the experiment.

We approach this question by running another set of linear fixed-effects regressions. In these regressions, we use the realized buyer profits as our dependent variable. Realized profits are the profits actually realized by buyers after buying from the selected bidder, as they are summarized in Table 2 as "buyer profit." The indicator variables for the content of buyer messages (summarized in Table 1) are now our main independent variables. We also control for the minimum cost c_i of the bidders a buyer faces in a particular round and include dummies for the first and last round. The regression results are presented in Table 5. Standard errors are clustered by matching group. The two models include the full sample of 432 auction rounds played by buyers.

Again, we vary the granularity of communication content we consider. First, we do not condition on the size of the requests and include *BM: Specific request* as an independent variable. Model (1) shows that specific requests increase realized buyer profits by 19.75 euro cents (p = 0.015). Second, we include the more granular definition of high and low requests and replace *BM: Specific request* with *BM: High request* and *BM: Low request*. The resulting model (2) reveals that the positive effect of specific requests is more robust for buyers who make high requests. High requests increase realized buyer profits significantly by 19.66 euro cents (p = 0.014), while the effect of low requests is of similar size but insignificant (p = 0.247). We summarize these results as follows.

Result 3: *Buyers making high requests realize higher profits than buyers making no specific request.*

Table 5 – Linear fixed-effects regressions with realized buyer profits as dependent variable

	(1)	(2)
BM: Specific request	19.75**	
	(6.158)	
BM: Unspecific request	6.800	6.797
	(13.12)	(13.04)
BM: Social proximity	-9.240	-9.233
	(5.847)	(6.156)
BM: Empty message	-5.821	-5.826
	(13.37)	(13.27)
BM: High request		19.66**
		(6.015)
BM: Low request		19.84
		(15.69)
Constant	148.0***	148.0***
	(19.26)	(19.19)
Observations	432	432
R^2	0.276	0.276
Adjusted R^2	0.264	0.262
AIC	4873.9	4873.9
BIC	4902.4	4902.4

Standard errors clustered by matching group are given in parentheses. Control variables: minimum bidder costs, indicator variables for first and last period.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

4 Conclusion

In a controlled laboratory experiment, we find that buyers in buyer-determined auctions send free-form text messages and use them mainly to make specific or unspecific requests for quality or profit and to reduce social distance. The relationship between the offers that bidders make and the messages they send is mediated by buyers' requests. In general, buyers may increase their profits by choosing bidders who make high promises. But buyers who make low requests would decrease their profits by trusting bidders who promise a low quality or profit. Also, buyers who make high requests would decrease their profits by selecting sellers who promise a low quality or profit. Further, we find that buyers in our experiment who make high requests reap higher profits than buyers who make no specific requests.

As in any laboratory study, our findings may be criticized for a lack of external validity. We acknowledge this criticism and hope that additional studies can help to bridge the gap between lab and field evidence. However, focusing on messages sent by sellers in procurement auctions, Brosig-Koch and Heinrich (2018) find similar evidence for the importance of social distance in the lab and in the field. Recent evidence on bilateral communication on procurement platforms by Strunk et al. (2022) and Ludwig et al. (2022) also suggests that the influence of bidders' communication content on the probability of winning a contract is mediated by buyers' requests in the field (see Footnote 10). Our study also complements recent experimental work on communication in procurement auctions by Onderstal and Yang (2020) by considering a setting with bilateral communication and moral hazard. Like them, we find that the effects of communication are not necessarily in line with standard theoretic predictions. We also add support to the study by Brosig-Koch et al. (2023), which uses a setup similar to ours and focuses on messages sent by buyers. Here we confirm their presupposition that specific requests are commonly used by buyers. Our findings are also in line with their observation that high requests are associated with higher offered quality.

Overall, our paper highlights the importance of informal communication in procurement settings where effort or quality is not contractable. These findings may be relevant to traditional procurement relationships, but also to modern platforms for the procurement of services that are used more and more to hire gig workers or freelancers. Most procurement settings involve communication beyond the definition of contracts or the exchange of bids. RFQ documents or project descriptions typically allow buyers to communicate requests along non-enforceable dimensions. Our study reveals that buyers' requests are crucial for the interpretation of bidders' messages when aiming to identify the best bids. Also, in the competitive setting we study, communicating high expectations appears to foster the buyer–supplier relationship.

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Appendix: Instructions

Welcome to the experiment!

Preface

You are taking part in an experiment about decision making in the field of experimental economics. During the experiment, you and the other participants will be asked to make decisions. By doing so, you can earn money. How much you are about to earn depends on your decisions. After the experiment, you will receive your earnings in cash.

The experiment is split into two different parts. Each of these parts is introduced by detailed instructions.

All participants will receive exactly the same instructions.

Please keep in mind that decisions you make in one of the two parts of the experiment do not have any influence on the other part of the experiment.

None of the participants will receive any information concerning the identity of other participants during the experiment.

Part 1

Please read the following instructions. Five minutes after you have received the instructions, we will come to your desk to answer remaining questions. Whenever you have questions during the experiment, please put up your hand or open the door to your cabin. We will come to your desk then.

During the first part of the experiment, you will participate in six auction rounds.

Description of the auction rounds

In each of the six auction rounds in which you participate, one project will be sold. There are exactly two bidders (= potential sellers): you and another bidder.

Procedure:

The bidders want to conduct the project. For each auction round and for both bidders, we have drawn the costs for conducting the project randomly and independently of each other from the range between 100 and 500 euro cents. All sums of this range could be realized with equal probability. Each of the two bidders will only be informed about his own costs for conducting the project.

At the beginning of each auction round, each of the two bidders can decide how much he wants to bid for the project. The bid is set to a maximum of 500 euro cents.

> The bidder who puts in the lowest bid wins the auction. His earnings in this round are equal to the difference between his bid and his costs for conducting the project.
>
> The bidder who puts in the highest bid loses the auction. In this case, his earnings in this round are equal to zero.
>
> If both bids are equal, the winner will be determined randomly (i.e., each bidder wins the auction with a probability of 50%).

Your fellow bidder:

Your fellow bidder is a computer in each of the six auction rounds. The computer is programmed to maximize its expected earnings in each auction round (in fact, it is bidding in every auction round according to the symmetric Nash equilibrium strategy under risk neutrality). The computer expects that you behave in the same way. The computer expects that your costs for conducting the project are drawn randomly and independently of each other out of the range from 100 to 500 euro cents and that all values of this range could be realized with equal probability.

Pay-out

The pay-out of all your earnings of the six auction rounds will take place at the end of the whole experiment.

Please keep in mind that none of the participants will receive any information about his earnings per round during the first part of the experiment.

Moreover, none of the participants will receive any information about the bidding behavior and the earnings of the other participants in part 1 during the whole experiment.

<u>Screen in Part 1</u>

Round 1 out of 6

Remaining time (for orientation):
Please decide now!

Round 1:
You are participant number 1 and bidder in all following auctions.

Auction:
In round 1, your costs to conduct the project amount to 200 euro cents.
Please enter your bid.
Your bid is:

Confirm bid

Please keep in mind: If you win the auction, your earnings in this round = your bid - 200.

Part 2

Please read the following instructions. Ten minutes after you have received the instructions, we will come to your desk to answer remaining questions. Whenever you have questions during the experiment, please put up your hand or open the door to your cabin. We will come to your desk then.

During the second part of the experiment, you will participate in 18 auction rounds.

Description of the auction rounds

In each of the 18 auction rounds in which you participate, one project will be sold. There are exactly two bidders (= potential sellers) and one buyer.

You will be informed at the beginning of the first auction round whether you decide in the role of a bidder or in the role of a buyer during the 18 auction rounds. You will maintain this role in all of the 18 auction rounds.

In each of the 18 rounds, the other two participants will be assigned to you randomly, so every time a buyer and two bidders interact. It is guaranteed that you will not meet the same group of participants in two consecutive rounds.

Procedure:

The buyer wants to have the project conducted. His valuation for a conducted project (with a quality of 100%, see below) is 500 euro cents in every auction round. The valuation determines how valuable the project is for the buyer at a 100% quality rate. Before each auction round, the buyer has the possibility to send a common message to both bidders. The bidders receive this message at the beginning of the auction phase.

The bidders want to conduct the project. For each auction round and for both bidders, we have drawn the costs for conducting the project (with a quality of 100%) randomly and independently of each other from the range between 100 and 500 euro cents. All values of this range could be realized with equal probability. Each bidder will be informed only about his own costs for conducting the project. The buyer does not receive any information concerning the costs. During each auction round, each bidder can send a message to the buyer.

Each auction round comprises three stages: In the "auction phase," both bidders bid for conducting the project. In the "buyer choice phase," the buyer chooses a winner (= seller) based on the bids and the messages. In the "quality choice phase," both bidders decide about the quality they conduct the project with, in case they should win the auction and are paid their bid by the buyer. The three stages are described in more detail below.

Auction Phase:

At the beginning of the auction phase, each of the two bidders can decide which bid he wants to make for conducting the project. The maximum bid is 500 euro cents.

The earnings per round are determined based on the choices made in the "seller choice phase" and the "quality choice phase" (see below).

Seller Choice Phase:

In the seller choice phase, the buyer decides about the winner (= seller). For this he receives the following information about each bidder: his bid and his message.

Quality Choice Phase:

In the quality choice phase, the bidders decide about the quality they conduct the project with, in case they should win the auction and are paid their bid by the buyer.

The quality rate has to be set between 50% and 100%. Each percent of quality costs the winner of the auction (= seller) one percent of the costs for conducting the project that were drawn for him in the corresponding round. Therefore, the seller's costs for conducting the project with 100% quality correspond to his costs, and the costs for conducting the project with 50% quality correspond to half of his costs.

Winner's earnings per round = bid - quality [%]*costs for conducting the project

The buyer's valuation of the project decreases with each percent less quality by one percent (i.e., by 5 euro cents). Therefore, the buyer's valuation for the project at a quality of 100% is equal to 500 euro cents. At a quality of 50%, it is equal to 250 euro cents.

Buyer's earnings per round = quality [%]*500 - auction's price

Pay-out

After the 18 auction rounds, the sum of your earnings per round together with your earnings of the first part of the experiment will be paid out in cash.

Basically, the content of the messages is left up to you. But it is not allowed to give personal details about oneself (e.g., name, age, address, subject). In case you violate the rules of communication, you will be expelled from the experiment and won't be paid out. Each message comprises a maximum of 420 signs (about two lines). Please note: to send a message, you have to press the enter key.

Before we start with the second part of the experiment in a few moments, we ask you to fill out a test of understanding on the computer.

Screens for bidders (= potential sellers) in part 2

Auction and quality choice phase:

Round

2 out of 18

Remaining time (for orientation):
Please decide now!

You are participant No. 1 and bidder in all following auctions.

AUCTION:

In round 2, your costs for conducting the project are 200 euro cents at a quality rate of 100%.

The buyer sent you the following message:
[BUYER'S MESSAGE]

AUCTION PHASE:

Please decide on the bid.

Your bid is:

QUALITY CHOICE PHASE:

Please decide on the quality.

Your quality is:

MESSAGE:

Please enter a message that is shown to the buyer in the seller choice phase in the field below.

Your message will be sent by pressing the enter key.
The message comprises a maximum of 420 signs (about two lines).

Please keep in mind: If you win an auction, your earnings in this round = your bid - quality [%]*200 [euro cents].

Confirm price and quality

Screens for buyer in part 2

Buyer message:

Round

2 out of 18

Remaining time (for orientation):
Please decide now!

You are participant No. 3 and a buyer in all following auctions.

MESSAGE:

Please enter a message that is shown to the bidders in the auction phase and quality choice phase in the field below.

Your message will be sent by pressing the enter key. The message can comprise a maximum of 420 characters (about two lines).

[BUYER'S MESSAGE]

OK

Seller choice phase:

Round

2 out of 18

Remaining time (for orientation):
Please decide now!

You are participant No. 3 and buyer in all following auctions.

SELLER CHOICE PHASE:

Your message to the bidders was
[BUYER'S MESSAGE]

BIDDER A:

Bidder A, whom you are randomly matched with in this round, bids a price of 300 euro cents.

Bidder A's message is:

[BIDDER A'S MESSAGE]

BIDDER B:

Bidder B, whom you are randomly matched with in this round, bids a price of 200 euro cents.

Bidder B's message is:

[BIDDER B'S MESSAGE]

Please keep in mind: your earnings in this round = quality [%]*500[euro cents] - bid

Please decide between the bidders:
Bidder A
Bidder B

OK