Customers with limited attention in a credence goods market*

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Abstract

Our paper studies how consumers' limited attention affects outcomes in a monopolistic market of credence goods (such as healthcare, repair services, legal advice). Our study is motivated by discrepancies between theoretical predictions and empirical evidence on market outcomes when customers can verify the type of quality they receive, as well as recent calls for more transparency in sellers' costs in some real-world markets. Whereas theory predicts market efficiency with equal markups for different qualities and sufficient quality provision, observations from laboratory experiments yield contradicting evidence of inefficiency. Our study presents both theoretical arguments and experimental evidence that customers' limited attention to sellers' costs can explain these differences. In our experiment, we find that when costs are made salient to customers, the market becomes more efficient. Sellers are more likely to provide sufficient quality, and prices are significantly closer to equal markups. Furthermore, we find that social preferences appear to be important for market outcomes.

JEL Codes: C91, D82, D91

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1 Introduction

The distinct feature of credence goods markets is informational asymmetry. Sellers are experts and have an informational advantage over customers. More precisely, sellers know which types of services customers need, whereas customers do not Darby and Karni (1973). Customers have to trust experts that the experts provide the correct service. Experts may exploit their informational advantage by providing more or more expensive services than necessary. Prime examples are markets for repair services and healthcare.

One of the key theoretical predictions is that (liable) experts should have no incentives to provide an inappropriate amount of service whenever customers can verify the type of service (Dulleck and Rudolf Kerschbamer, 2006). In equilibrium, experts post prices with equal markups for the different types of services. By posting equal-markup prices, experts credibly signal to perform the type of service that the customer needs. Because customers anticipate that experts provide necessary services under equal markups, customers' willingness to pay for a service is maximal. A monopolistic expert sets these equal markup prices in a way to fully extract customer rent. In a competitive credence goods market, prices cover experts' marginal costs of providing a service.

In real markets, however, these predictions appear to contradict observations. The FBI estimates that up to 10% of the 3.3 trillion US dollars of yearly health expenditures in the United States are due to fraud (Federal Bureau of Investigation, 2011).[1] Gottschalk et al. (2020) show that 28% of dentists' treatment recommendations involve overtreatment recommendations. In car repair services, Taylor (1995), Schneider (2012), and Rasch and Waibel (2018) report fraudulent behavior by garages. Rudolf Kerschbamer et al. (2016) document fraud in computer repair services. Balafoutas, Beck, et al. (2013) and Balafoutas, Rudolf Kerschbamer, et al. (2015) identify fraud in the market for taxi rides.

So far, the literature has offered different reasons to explain such discrepancies between the theoretical results and real-life observations. Explanations include expert heterogeneity (see, for example, Dulleck and Rudolf Kerschbamer, 2009, Frankel and Schwarz, 2014, and Hilger, 2016), the coexistence of selfish and conscientious experts (see, for instance, Liu, 2011 and Fong et al., 2014), and a lack or ban of price discrimination (see, for example, Dulleck and Rudolf Kerschbamer, 2006). In this paper, we offer an alternative explanation: customers' limited attention. The idea is based on insights from psychological research: Due to cognitive constraints and large amounts of information, people often fail to account for all relevant details when making decisions.[2] Our approach assumes that customers do not take into account all relevant information that determines an expert's payoff.

We employ a simple model to investigate the existence and impact of limited attention in a credence goods market. In the model, customers suffer from either a minor or a major problem. The major service solves both problems but is more costly for a monopolistic expert than the minor service. The minor (and less costly) service can only solve the minor problem. Service costs are common knowledge among experts and customers. By posting an equal-markup price vector, the expert could credibly signal that she has no incentive to over- or undertreat. We assume that customers can verify the treatment applied (that is, we rule out overcharging) but do not fully account for treatment costs. It crucially affects their evaluation of expert profits and, hence, the

[1] For an overview of the phenomenon of so-called physician-induced demand (PID), see McGuire (2000)

[2] See Lim and Teoh (2010) for an overview in the context of finance and accounting. Heidhues and Kőszegi (2018) discuss limited attention in the context of applications in industrial organization.

expert's incentive to defraud them. We predict that customers' limited attention increases the insufficient service provision and raises the markup difference between the major and the minor services. Moreover, customers are more willing to pay for an offer that triggers insufficient service provision if their attention is limited.

We test the predictions in a laboratory experiment. We vary whether a customer observes – in addition to the expert's price vector – the expert's profit vector. A customer then decides whether or not she wants to interact given the posted prices. The expert observes which type of problem her customer has and decides whether to provide either the minor or the major service. The expert charges for the provided service. In the treatment ATTENTION, customers observe the prices, and experts' costs are made salient before deciding on interaction, whereas in the NOATTENTION treatment, customers only observe prices. Experts and customers are randomly rematched in our lab experiment and hence do not suffer from reputational concerns. We find that experts' price vectors are significantly closer to the equal markup when costs are made salient than when they are not. Customers' interaction probability decreases by around 20 percentage points over time and does not significantly vary across treatments. Controlling for subjects' covariates, experts undertreat customers significantly more often under NOATTENTION than under ATTENTION.

Attention decreases total welfare calculated as accumulated profits. Due to the rapid decrease in interaction over time, the customer surplus is smaller under ATTENTION than under NOATTENTION. Experts benefit from limited attention because they can extract the additional surplus generated by more sufficient treatments. When we define welfare as accumulated profit minus the outside option, and random differences in the customers' type of problem (minor or major) are considered, welfare improves under ATTENTION.

In many credence goods markets, there is a call to make experts' financial interests more transparent. Due to limited attention, customers do not fully account for experts' financial incentives. An example of a sector in which more transparency is demanded is the market for health services. In Germany, for instance, many health services are paid for by the patients' insurance companies. The payments are organized bilaterally between the insurance company and the physician without any patient involvement. To increase transparency for such services, patients have had the right to ask for a patient receipt since 2012. This receipt must report the treatments performed and the (expected) costs.[3]

Providers themselves can also advocate for increased transparency. For example, for their car repair services, carmaker Opel introduced a new app-based information service called "MyDigitalService". When car owners have their cars inspected or repaired, they can now more easily follow the different steps in the process and are provided with information regarding additional costs when unanticipated services become necessary.[4]

Our study is directly related to the literature on credence goods. Closest to our paper is the article by Dulleck, Rudolf Kerschbamer, and Sutter (2011), which employs a large-scale laboratory experiment challenging the seminal model by Dulleck and Rudolf Kerschbamer (2006). In particular, the authors study the impact of institutions, such as verifiability or liability, on outcomes in credence goods markets and show that liability is an effective tool for improving outcomes in credence goods markets. However, the authors find no evidence that verifiability fosters market results.

[3]See, for example, https://www.bundesgesundheitsministerium.de/themen/praevention/patientenrechte/patientenquittung.html.

[4]See, for example, https://www.auto-motor-und-sport.de/tech-zukunft/werkstatt/opel-mydigitalservice-transparenz-inspektion-reparatur/.

There are multiple explanations for why verifiability seems to be less effective for improving market outcomes. Previous work has explained the differences between the prediction of no overtreatment if services are verifiable and the observation in real markets is primarily based on experts' characteristics. Emons (1997, 2001) argues that experts' utilization of capacities drives overtreatment. If demand is low, experts may have the incentive to provide excess services to fill capacities. Gottschalk et al. (2020) provides evidence from a field experiment. Dentists with a low utilization are correlated with a higher probability of receiving an overtreatment recommendation. Hilger (2016) develops a model that accounts for experts' heterogeneity with respect to experts' costs of service provision. If costs are unobservable, experts cannot credibly signal equal markups. Hilger (ibid.) assumes experts are liable for their services. Hence, experts may have an incentive to overtreat.

To our knowledge, the only paper that is based on customers' characteristics is R. Kerschbamer et al. (2017). The authors suggest that customers' preferences may drive the deviations observed in Dulleck, Rudolf Kerschbamer, and Sutter (2011). More precisely, the authors argue that heterogeneity in social preferences may explain the observed behavior. They show theoretically that equal-price equilibria are robust to pro-social but not anti-social preferences. Our study extends this strand of literature by adding the perspective of consumers' limited attention.

Our paper also contributes to the literature on the behavioral industrial organization that investigates market outcomes when consumers have behavioral biases.[5] The closest strand of literature to our setup are studies on add-on pricing, where consumers do not pay attention to the additional price of a two-part tariff (Armstrong and Vickers, 2012; Gabaix and Laibson, 2006; M. D. Grubb, 2015; Heidhues and Koszegi, 2017). Our study contributes by investigating limited attention with regard to a different factor, namely sellers' costs. In particular, customers are fully attentive to the prices of two treatments offered by the sellers, but not to the cost of each treatment. Costs do not directly show up in the customers' payoff function, yet they influence the treatment offered by sellers. The chosen treatment then determines whether consumers receive proper treatment, affecting their payoffs.

The remainder of the paper is as follows. Section 2 provides the theoretical framework for the credence goods market. Section 3 lays out our experimental design and shows our hypotheses. Section 4 displays and discusses our results before we conclude in Section 5.

2 Theoretical framework

2.1 Market

We model a market with verifiability and without liability following Dulleck and Rudolf Kerschbamer (2006). Consider a market with an expert and a customer. A customer (she) has either a major or a minor problem. The customer knows that she has a problem but does not know whether it is major or minor. However, the customer knows that she has the major problem with an ex-ante probability h and the minor problem with an ex-ante probability $(1-h)$. These probabilities are common knowledge to both the expert and the customer.

The expert (he) can identify the problem at no cost. He can choose to provide either major or minor treatment. The cost of the major treatment is $\bar{c}$ and the cost of the minor treatment is $\underline{c}$,

[5] See, for example, M. Grubb (2015) and Heidhues and Kőszegi (2018) for an overview.

with $\underline{c} < \bar{c}$. The major treatment solves both problems, whereas the minor treatment only solves the minor problem. The expert posts take-it-or-leave-it prices.

The customer has a valuation of $v > 0$ when receiving sufficient treatment. The expert is *not liable* – that is, he can treat a customer who has a major problem with minor treatment. The prices for the major and the minor treatment are denoted as $\bar{p}$ and $\underline{p}$, respectively, with $\underline{p} < \bar{p}$. Due to the *verifiability* of treatment, the expert has to charge $\bar{p}$ if he provides the major treatment and $\underline{p}$ if he provides the minor treatment (no overcharging). The customer does not know the necessary treatment but knows whether her problem has been solved. We refer to appropriate treatments whenever the customer has a major problem and receives a major treatment or when she has a minor problem and receives a minor treatment. Undertreatment occurs when the customer has a major problem but only receives a minor treatment. Finally, overtreatment means that a customer with a minor problem receives a major treatment.

The game is characterized as follows:

1. The expert posts a price menu $(\bar{p}, \underline{p})$ for the major and minor treatment, respectively.

2. The customer chooses whether to interact with the expert. We refer to this decision as "interaction" or "no interaction", respectively. The presentation of information differs across conditions:

   (a) NoAttention condition: The customer observes the price menu posted by the expert.

   (b) Attention condition: The customer observes the price menu posted by the expert and the expert's (potential) profit for each price.[6]

   If the customer chooses not to interact, the game ends. In that case, the expert and the customer both get the outside option u. If the customer chooses to interact, the game proceeds with stage 3.

3. Nature draws the type of problem that the customer has.[7]

4. The expert observes the problem type of the customer. The expert then provides either major or minor treatment and charges a price according to his treatment recommendation ($\bar{p}$ or $\underline{p}$).

5. The expert observes his payoff, and the customer observes her payoff.

If there is interaction, the expert's payoff (profit) is determined by the price p ($p \in \{\underline{p}, \bar{p}\}$) minus the cost c ($c \in \{\underline{c}, \bar{c}\}$) of the treatment applied, that is, $\pi_e = p - c$. If there is no interaction, the payoff amounts to u.

If the customer chooses to interact and the expert does not undertreat her, she derives her gross valuation of v. If she decides to interact and the expert undertreats her, she derives a valuation of zero. In either case, the customer must pay the price p for the treatment she receives. Hence, for each period, her payoff is either $\pi_c = v - p$ if she is not undertreated or $\pi_c = -p$ if she is undertreated. If the customer decides not to interact, she receives a payoff of u. The game and the payoffs are illustrated in Figure 1.

[6]Note that even when a customer cannot directly observe the expert's profit, she can calculate the profit because the costs of both treatments are common knowledge.

[7]As Dulleck and Rudolf Kerschbamer, 2006 point out, it does not make a (game-theoretic) difference whether nature determines the severity of the problem after the customer has consulted an expert (but before the expert has performed the diagnosis) or at the very beginning.

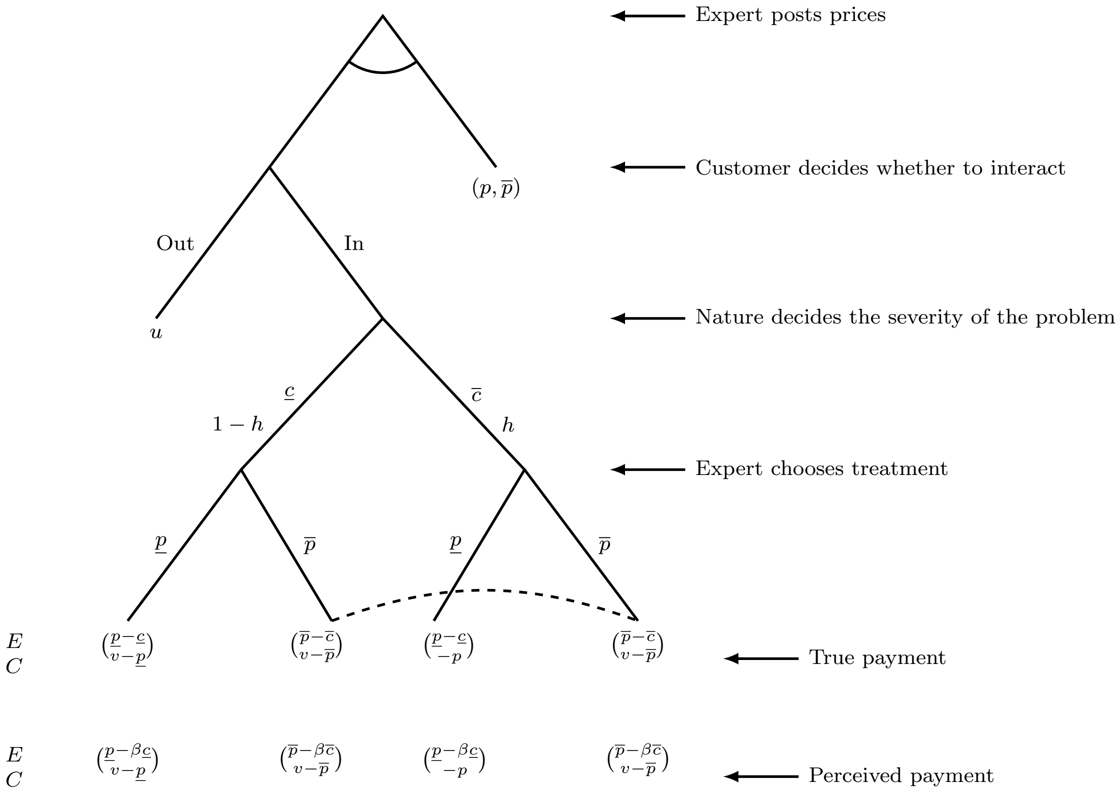

Figure 1: Game tree.

2.2 Customers with limited attention

We assume that the customers have limited attention. When deciding on interaction, there are three related features of this decision, namely prices $(\underline{p}, \bar{p})$, valuation v, and the likelihood of being undertreated. The likelihood of being undertreated is determined directly by two factors: the severity of the customer's problem and the action chosen by the expert. With the expert being a profit-maximizing agent, he always chooses the action that gives him the higher profit.

We assume that prices and the valuation are salient features, whereas the probability of being undertreated determined by the expert's profit is a hidden feature. We back up this assumption by three observations. First, several laboratory experiments on credence good markets (see, for example, Dulleck, Rudolf Kerschbamer, and Sutter, 2011, and screenshots from our treatment NoAttention in Figure 7) have a design feature that only prices are shown to customers when they decide on interaction. Second, valuation and prices immediately show up in the customer's payoff function. Third, although the expert's profit function and costs are common knowledge, they are communicated to the customer once at the beginning of the experiment. Thus, it is reasonably more difficult for customers to recall this information in every period (see Bordalo et al., 2020). When seeing the information concerning the expert's profit in Decision 3 of the Attention treatment (see Figure 8), the customer considers the hidden feature when deciding on interaction.

Since the expert's profit equals price minus cost, we consider the cost of each treatment as the direct proxies for the hidden feature of the likelihood to be undertreated. In the experiment, we manipulate the salience of this hidden feature by (not) showing the expert's profits for each treatment at the interaction stage, hence (not) indicating costs. We assume that the expert is aware that the customer has limited attention, but the customer is not aware that the expert knows thereof.

The degree of limited attention is captured by parameter β ($\beta \in (0, 1]$) (see Bordalo et al., 2020). If $\beta = 1$, all features are equally salient. If $\beta \to 0$, the customer takes only salient features into consideration and completely neglects the hidden feature. If the customer decides to interact, the expert's profit is $\pi = p - c$, whereas profit as perceived by a customer with limited attention equals $\pi = p - \beta c$. We differentiate among two cases: $\beta = 1$ and $0 < \beta < 1$.

Case 1: $\beta = 1$

In this case, the customer is equally attentive to all features. As shown by Dulleck and Rudolf Kerschbamer (2006), in equilibrium:

- The expert posts equal-markup prices:

$$\bar{p} = v + (1 - h)(\bar{c} - \underline{c}) - u$$
$$\underline{p} = v - h(\bar{c} - \underline{c}) - u.$$

- The expert provides the appropriate treatment.
- The customer chooses to interact.

Case 2: $0 < \beta < 1$

When customers are inattentive to the hidden feature, equal-markup prices from the customers' point of view take the following form:

$$\bar{p}_c = v + \beta(1 - h)(\bar{c} - \underline{c}) - u$$
$$\underline{p}_c = v - \beta h(\bar{c} - \underline{c}) - u.$$

Note, however, that $\forall \beta \in (0, 1)$, $\underline{p}_c$ is strictly larger than $\underline{p}$ and $\bar{p}_c$ is strictly smaller than $\bar{p}$. We thus have:

Lemma 1 *When customers have limited attention, the equal-markup tariff $(\bar{p}, \underline{p})$ is perceived by customers as a tariff, such that the markup for the major treatment exceeds that for the minor treatment.*

Now we analyze the optimal price-setting by the expert. To this end, consider the three classes of tariffs as perceived by customers:

(i) The markup for the major treatment exceeds that for the minor treatment ($\bar{p} - \beta\bar{c} > \underline{p} - \beta\underline{c}$),

(ii) the markup of the minor treatment exceeds that for the major treatment ($\bar{p} - \beta\bar{c} < \underline{p} - \beta\underline{c}$), and

(iii) markups are the same for both treatments ($\bar{p} - \beta\bar{c} = \underline{p} - \beta\underline{c}$).

Customers with limited attention expect the following: The expert performs the major treatment if he posts (i), he performs the minor treatment if he posts (ii), and he is indifferent if he posts (iii).[8] The customers observe the price and infer experts' incentives accordingly. Expert's profits in these cases amount to:

(i) $v - u - \beta\bar{c}$

(ii) $(1-h)v - u - \beta\underline{c}$

(iii) $v - u - \beta(h\bar{c} + (1-h)\underline{c})$.

Given that $u > 0, \bar{c} > \underline{c}, v > (\bar{c} - \underline{c}), \beta \in (0,1)$, and $h \in [0,1]$, the equal-markup tariff gives the highest obtainable profit for the expert. We can thus state the following proposition:

Proposition 1 *When the customer has limited attention, conditional on interaction,*

(i) the expert always posts tariffs, such that the markup of the minor treatment exceeds that for the major treatment, and

(ii) the expert always provides the minor treatment.

3 Experiment

3.1 Experimental design

We build our experimental design on Dulleck, Rudolf Kerschbamer, and Sutter (2011). Our NoAttention condition replicates the results from the baseline condition with verifiability in Dulleck, Rudolf Kerschbamer, and Sutter (ibid.). We introduce salience of the expert's profit in our second condition Attention.

Subjects are assigned to be either an expert (called Player A in the experiment) or a customer (called Player B in the experiment). Each market consists of eight subjects, with four experts and four customers. In each period, one expert interacts with one customer. The assignment to group and role is random and does not change during the experiment. The stage game is repeated for 16 periods. Subjects are re-matched within their market at the beginning of each period. At the end of each period, subjects are informed about their profit for the current period and their own accumulated profit.

The timing is displayed in Figure 2. In each period, the expert chooses prices $p_i \in [1, 11] \in N$ for each of the two conditions. The customer then chooses whether to interact. If a customer chooses not to interact, the period ends and she and her matched expert both get $u = 1.6$ ECU (outside option). If a customer decides to interact, the expert provides either the minor treatment $\underline{c}$ at costs of 2 ECU (called Action 1 in the experiment) or the major treatment $\bar{c}$ at costs of 6 ECU (called Action 2 in the experiment). The customer derives a utility $v = 10$ ECU if she is sufficiently treated and 0 otherwise. The probability of a customer having a major problem is $h = 0.5$. The expert and the customer both learn their respective payoffs after every round.

After the experiment, we use two incentivized choices to elicit individuals' risk and loss preferences. We employ the standard choice list by Holt and Laury to measure individuals' level of risk

[8] Similarly to Dulleck and Rudolf Kerschbamer, 2006, we assume that the expert is indifferent between two treatments if he posts an equal-markup tariff. Moreover, this is common knowledge.

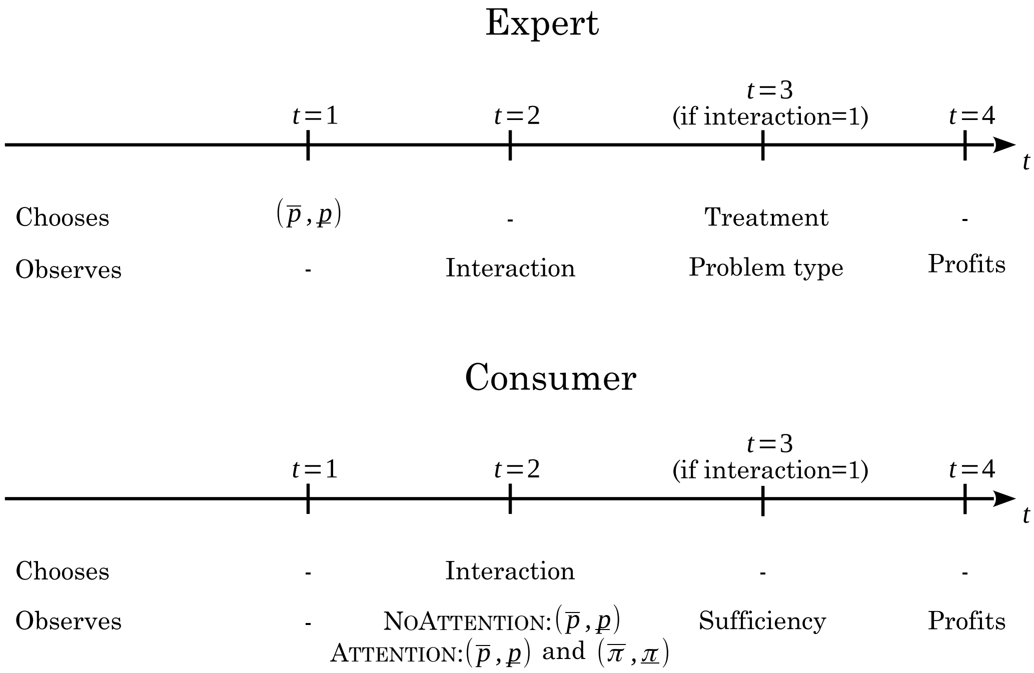

Figure 2: Timeline

aversion. In a second choice list similar to Karle et al. (2015), we measure individuals' degrees of loss aversion. We ask for individuals' beliefs conditional on the subjects' role of a buyer or a seller.[9] We further complement the incentivized decisions by the validated question on risk aversion by Falk, Becker, T. J. Dohmen, et al. (2016). Selected questionnaire items from the preference survey module of Falk, Becker, T. J. Dohmen, et al. (ibid.) serve as a measure of social preferences. We complete the post-experimental part by recording individuals' reasoning for their decision in the experiment and socio-demographics.

Table 1 provides an overview on subjects' covariates. The left column shows averages across all participants, the two middle columns show descriptive statistics per condition along with the significance level of the difference in the right column. Our randomly drawn subjects are on average slightly risk-loving (using Holt and Laury (2002) switching point < 5 implies risk-loving). It holds for both conditions. Subjects are loss averse with again virtually no variation across conditions. The Falk, Becker, T. Dohmen, et al. (2018) General Preference Survey (GPS) preference measures confirm, consistently with the Holt and Laury (2002), that our subjects are risk-averse.

[9]See the elicitation of beliefs in subsection A.2.

Table 1: Descriptive statistics.

	All	NoAttention	Attention	Difference
Loss aversion (lottery)	4.31	4.33	4.29	$p = 1.000$
Risk aversion (lottery)	4.22	4.23	4.22	$p = 0.953$
Risk aversion (question)	3.78	3.60	3.90	$p = 0.370$
Social preference	4.14	4.08	4.18	$p = 0.679$
Generosity	118.64	140.67	103.96	$p = 0.409$
Belief (buyer)	0.31	0.33	0.29	$p = 0.616$
Belief (seller)	0.42	0.42	0.43	$p = 0.678$
Gender	0.53	0.63	0.47	$p = 0.038$
Age	24.72	25.15	24.43	$p = 0.345$
Number of obs.	120	48	72	15

We classify individuals into two categories based on their social preferences. We define a subject as pro-social or selfish based on the median split in the elicited social preference. In both conditions, the means are slightly higher than the median: It is 15.42 in Attention and 15.90 in NoAttention, and, therefore, we assign 15 to the selfish group. Then, our split threshold also conveniently corresponds to giving a stranger the same amount she spent to help. We thus call subjects pro-social if they are willing to give at least the amount the stranger spent to help them (more than 15 ECU), and call them selfish otherwise (15 ECU and less). We then define a market as pro-social based on the number of pro-social experts in this market (from 0 to 4) and treat this measure as a continuous control variable in all following regressions. We only take into account the number of pro-social experts (but not customers), because experts make the two main decisions in the market: pricing and mistreatment. customers, on the other hand, can only accept or reject experts' offers.

3.2 Experimental procedure

We conducted our experiment at the DICE Lab of the University of Düsseldorf in June 2019. We programmed the experiment using zTree (Fischbacher, 2007). Subjects were recruited via ORSEE (Greiner, 2004) and were mostly enrolled as students at the University of Düsseldorf. Upon arriving in the lab, each subject was randomly assigned to a cubicle and provided with instructions. Subjects were given enough time to read the instructions and were allowed to ask experimenters clarifying questions privately. The sessions started after all questions had been addressed.

In total, 120 subjects participated in six sessions of the experiment. Each session lasted for about one and a half hours. On average, subjects earned 18.34 euro. In total, 48 subjects participated in the NoAttention condition, and 72 subjects participated in the Attention condition.

3.3 Hypotheses

Based on our theoretical model and the experimental parameterization, we now form our hypotheses for expert and customer behavior. Since customers do not observe the expert's profit when deciding whether to interact under NoAttention, our model predicts the following expert behavior:

Hypothesis 1 *The expert is more likely to post an undertreatment tariff in* NoAttention *than in* Attention*.*

Hypothesis 2 *The expert's mark-up difference is larger in* NoAttention *than in* Attention*.*

Hypothesis 3 *The expert is more likely to undertreat a customer in* NoAttention *than in* Attention*.*

Customer behavior is predicted as follows:

Hypothesis 4 *A customer is more likely to interact given undertreatment price vectors in* NoAttention *compared to* Attention*.*

4 Results

This section is organized as follows: First, we present how customers' limited attention affects experts' decisions. We analyze the price vectors that experts post and the treatment composition they provide given their posted prices. We then focus on the buyers' side of the market, that is, how limited attention affects their decisions to interact. Finally, we discuss how increased attention influences customers' and experts' welfare in our experiment. Additionally, we look in-depth at how each market outcome varies with the salience of experts' profits for different types of individuals and markets according to the social preferences classification (see Section 3).

Table 2 provides a first overview of the outcomes on the aggregate level:

Table 2: Summary statistics.

	Attention		NoAttention	
	Mean	Std. dev.	Mean	Std. dev.
Major price $\bar{p}$	7.93	1.35	7.77	1.57
Minor price $\underline{p}$	5.39	1.73	5.68	1.67
Markup difference Δ	−1.47	1.94	−1.91	1.69
Interaction	0.52	0.50	0.48	0.50
Sufficient	0.38	0.49	0.37	0.48
Number of obs.	1152	1152	768	768

In the individual-level data analysis, we control for the price level and previous period market characteristics. We further account for individual experts' characteristics that include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs.

Expert outcomes

Prices and markups

We start by analyzing how the probability of posting undertreatment price vectors varies with the degree of attention. In our experiment, experts do post undertreatment vectors frequently independent of the condition. More precisely, 79.2% of the price vectors in NoAttention and 77.4% of the price vectors in Attention are undertreatment vectors. On the aggregate level, the share of undertreatment vectors is not significantly different ($p = 0.649$, t-test with clustering on subject level)On the individual level, Table 3 reveals however that, keeping everything else

Table 3: Probability of posting an undertreatment vector.

Undertreatment vector	All experts	Pro-social experts	Selfish experts
Attention	−0.17***	−0.05	−0.20**
	(0.05)	(0.09)	(0.08)
Pro-social market		0.03	0.04
		(0.04)	(0.05)
Major price	☑	☑	☑
Undertreatment vector $_{t-1}$	☑	☑	☑
Interaction $_{t-1}$	☑	☑	☑
Sufficient $_{t-1}$	☑	☑	☑
Individual controls	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
Number of obs.	900	360	540

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. All regressions are estimated using probit, average marginal effects are displayed. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

constant, experts are significantly less likely to post an undertreatment vector in Attention than inNoAttention. We find that the probability of posting an undertreatment price vector in Attention is 17 percentage points lower compared to NoAttention. Our finding is in line with Hypothesis 1, that is, experts are more likely to post undertreatment price tariffs in NoAttention than in Attention.

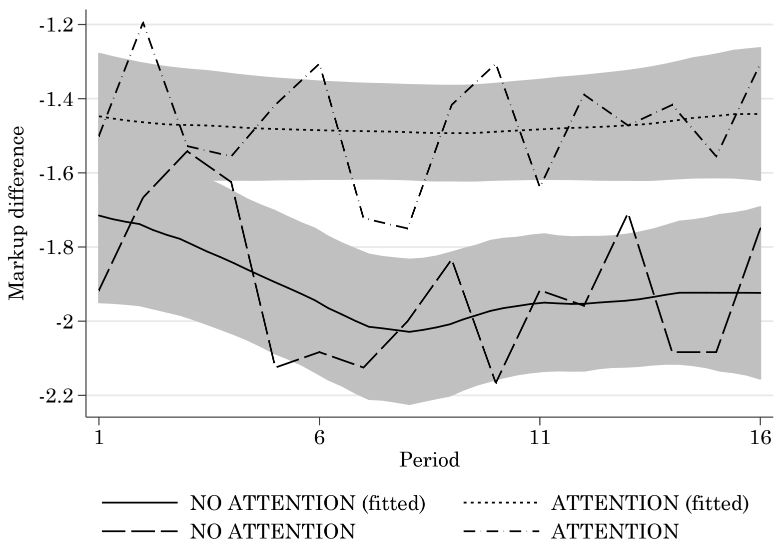

Figure 3: Average markup difference

Note: Fitted values are estimated using Epanechniov kernel with an optimal bandwidth. Gray areas correspond to 95% confidence intervals.

The impact of salience on the likelihood of posting an undertreatment vector varies for experts with different social preferences. Selfish experts are 20 percentage points more likely to post undertreatment vectors in NoAttention than in Attention. For pro-social experts, the likelihood does not change significantly across conditions. The number of pro-social experts in the market does not seem to matter for price-setting behavior.

Experimental evidence suggests that the markup difference is, on average, negative in both conditions with mean values of −1.91 and −1.47 in NoAttention and Attention, respectively. Figure 3 shows that the average markup difference in Attention is less negative than in NoAttention that is, prices set are significantly closer to the equal-markup prices predicted by standard theory. This difference is significant on the aggregate level ($p = 0.027$, t-test with clustering on subject level). Additionally, Table 4 shows a substantial effect of Attention on an individual level: Experts whose profits are displayed to customers post price vectors with a significantly higher markup difference. We account for market characteristics and observe that the markup difference is also heavily affected by the overall price level and inertia. We include them in our regression analysis to control for these possible explanations. However, experts do not account for interaction in the previous period and the sufficiency of the treatment they have previously provided.

Social preference classification provides surprising evidence: salience of the experts' profits has the opposite impact on the average markup difference for pro-social and selfish experts. We find that the increase in the markup difference we have documented on the aggregate and market levels is driven entirely by selfish experts. Customers' attention to their profits has a substantial positive effect on them. Pro-social experts, on the contrary, post price vectors with an even lower markup difference in Attention condition in comparison to NoAttention.

Table 4: Markup difference

Markup difference Δ	All experts			Pro-social	Selfish
	(1)	(2)	(3)	experts	experts
Attention	2.93***	1.22***	1.22***	−0.78**	1.76***
	(0.34)	(0.26)	(0.26)	(0.31)	(0.50)
Pro-social market				−0.23	−0.26
				(1.37)	(0.29)
Major price		0.55***	0.55***	0.67***	0.43***
		(0.06)	(0.06)	(0.08)	(0.08)
Markup difference $_{t-1}$		0.52***	0.52***	0.19***	0.41***
		(0.04)	(0.04)	(0.07)	(0.06)
Interaction $_{t-1}$			0.01	−0.17	0.12
			(0.13)	(0.13)	(0.19)
Sufficient $_{t-1}$			−0.05	−0.13	−0.11
			(0.14)	(0.16)	(0.20)
Individual controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
Number of obs.	960	900	900	360	540

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences and elicited beliefs. We also include time (period) and market fixed effects.

Next, we want to analyze whether the increase in the markup difference was driven by an increase of $\overline{p}$, a decrease of $\underline{p}$, or both. The price for the minor treatment is on average 5.68 in NoAttention and 5.39 in Attention. The price for the major treatment is on average 7.77 in NoAttention and 7.93 in Attention. Regression analysis in Table 5 shows, however, that the higher markup difference in Attention than in NoAttention is driven mainly by the lower price of the minor treatment. Both prices for major and minor treatments are significantly autocorrelated, that is, are highly correlated with the respective prices set in the previous period. Both prices are also positively correlated to the interaction in the previous period.

Table 5: Prices.

Prices	All experts		Pro-social experts		Selfish experts	
	$\underline{p}$	$\overline{p}$	$\underline{p}$	$\overline{p}$	$\underline{p}$	$\overline{p}$
Attention	−0.93***	0.12	0.81***	0.25	−1.23**	0.23
	(0.26)	(0.22)	(0.28)	(0.25)	(0.48)	(0.38)
Pro-social market			0.44	0.82	0.16	0.23
			(1.61)	(1.78)	(0.26)	(0.22)
Minor price $_{t-1}$	0.54***		0.33***		0.57***	
	(0.05)		(0.07)		(0.07)	
Major price $_{t-1}$		0.47***		0.43***		0.43***
		(0.05)		(0.08)		(0.07)
Markup difference $_{t-1}$	−0.09**	0.03	−0.00	−0.13**	0.05	−0.01
	(0.04)	(0.03)	(0.07)	(0.07)	(0.06)	(0.05)
Interaction $_{t-1}$	0.40***	0.30***	0.35**	0.23	0.39**	0.30**
	(0.11)	(0.11)	(0.14)	(0.15)	(0.16)	(0.14)
Sufficient $_{t-1}$	0.05	0.03	0.19	0.17	0.06	−0.05
	(0.12)	(0.12)	(0.16)	(0.18)	(0.18)	(0.15)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	900	900	360	360	540	540

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

Table 5 also shows the mechanism of price setting for pro-social and selfish experts. There is no effect of salience on the price of the major treatment: neither for pro-social nor for selfish experts. Instead, the difference in their behavior is captured entirely by $\underline{p}$. Pro-social experts set the price of the minor treatment 0.8 ECU higher in Attention compared to NoAttention, whereas selfish experts, on the contrary, lower it by 1.2 ECU in Attention. Therefore, the price for the minor treatment drives the gap of the salience effect on the markup difference of about 2 ECU.

One could argue that displaying expert's profits to customers decreases the overall complexity of the experiment. However, as shown in Figure 4, time trends in both prices are very similar in Attention and NoAttention, which suggests that price differences can be explained by condition and not by difference in learning. Parallel development of prices over 16 periods helps us to rule out this potential explanation.

Mistreatment

If a customer decided to interact upon posted prices, an expert observes the severity of her problem and chooses which treatment to provide. Given verifiability, there is no scope for overcharging. However, experts may still mistreat customers. Mistreatment can generally occur in two cases: when a customer with a minor problem receives a major treatment (overtreatment), and when a customer with a major problem receives a minor treatment (undertreatment). Under- and overtreatment rates are calculated as a share of all under-/overtreatments given under-/overtreatment was possible (that is, undertreatment rates for only customers with major problems, overtreatment rates for only customers with minor problems).

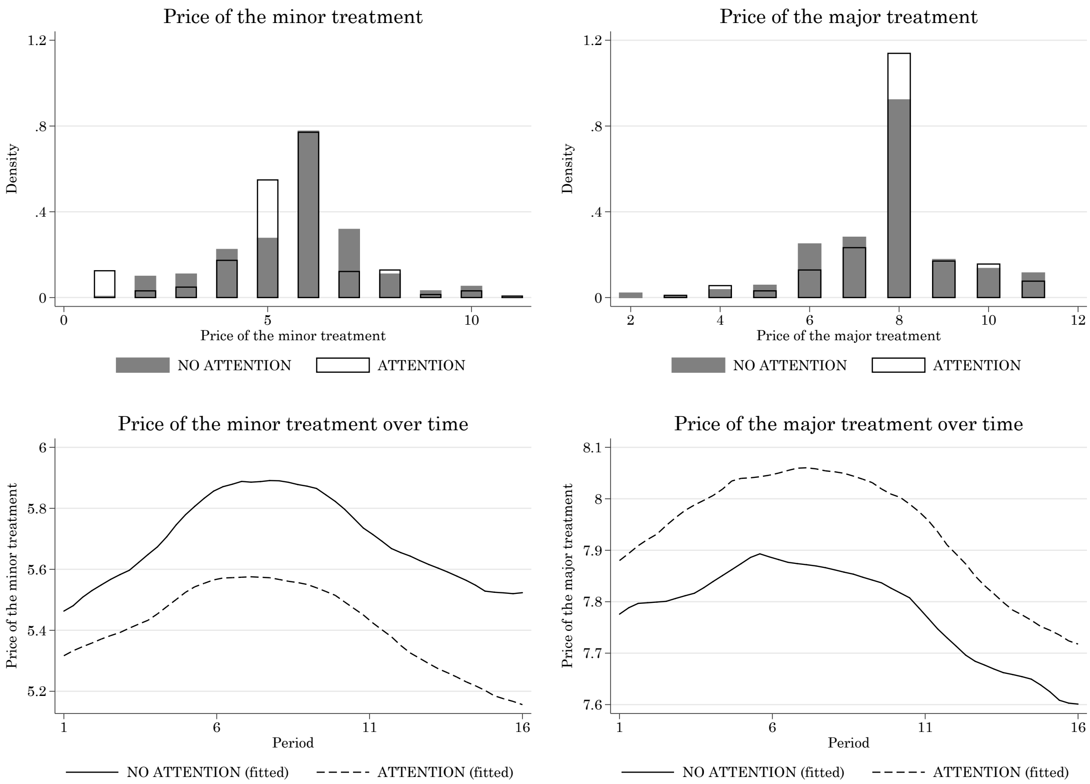

Figure 4: Prices

Note: Fitted values are estimated using Epanechniov kernel with optimal bandwidth.

Undertreatment rates are 53.66% and 49.69% in NoAttention and Attention, respectively (MWU test, $p = 0.560$). Overtreatment rates are 20.19% and 20.57% in NoAttention and Attention, respectively (MWU test, $p = 0.943$). We estimate the probability of sufficient treatment provision for customers with a major problem and show the results in Table 6. We find that overall customers in Attention are more likely to receive a sufficient treatment in comparison to those in NoAttention, which is in line with Hypothesis 3. The impact of salience is insignificant for selfish experts but large and highly significant for pro-social experts: Pro-social experts are almost twice as likely to provide a sufficient treatment in Attention compared to NoAttention. Interestingly, despite posting more undertreatment price vectors, pro-social experts undertreat less. Selfish experts, on the contrary, post fewer undertreatment vectors in Attention; however, their likelihood of sufficient treatment provision does not vary significantly.

Generally, experts in Attention make more efficient decisions. The probability of providing a sufficient treatment conditional on a customer having a minor problem is 50.31%, and it differs a lot depending on the price vector, an expert chose in this period: It is less likely that an expert provides sufficient treatment if he posted an undertreatment vector (41.60%) and more likely otherwise (82.35%). In NoAttention this pattern is much less pronounced. The probability of providing a sufficient treatment conditional on a customer having a minor problem is 46.34%, and it differs rather little depending on the price vector set: When an undertreatment vector has been posted, an expert provides a sufficient treatment with a probability of 45.07%. Otherwise, the probability of sufficient treatment provision is higher (54.55%), but only marginally.

Table 6: Probability of sufficient treatment provision.

Sufficient	All experts (1)	All experts (2)	All experts (3)	Pro-social experts	Selfish experts
ATTENTION	0.34***	0.27**	0.23*	0.97***	0.40
	(0.12)	(0.13)	(0.13)	(0.36)	(0.25)
Pro-social market				−0.16	−0.15
				(0.16)	(0.15)
Undertreatment vector		☑	☑	☑	☑
Overtreatment vector			☑	☑	☑
Individual controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
Number of obs.	241	241	241	86	155

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

Table 7: Overtreatment probability.

Overtreatment	All experts (1)	All experts (2)	All experts (3)	Pro-social experts	Selfish experts
ATTENTION	0.50***	0.20**	0.14*	0.19	0.38***
	(0.13)	(0.09)	(0.08)	(0.13)	(0.15)
Pro-social market				-0.15**	-0.22**
				(0.07)	(0.10)
Undertreatment vector		☑	☑	☑	☑
Overtreatment vector			☑	☑	☑
Individual controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
Number of obs.	241	241	241	74	158

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences and elicited beliefs. We also include time (period) and market fixed effects.

Average overtreatment probabilities are very similar in ATTENTION (20.57%) and NOATTENTION (20.19%) (MWU test, $p = 0.943$). However, we find that conditional on other market outcomes, customers in ATTENTION are more likely to be overtreated than in NOATTENTION (see Table 7). More precisely, when an expert in ATTENTION condition posts an overtreatment vector, and a matched customer has a minor problem the expert overtreats with certainty (a probability of 100%), whereas the probability of overtreatment is only 7.44% when another price vector was posted. In NOATTENTION the pattern is similar but less pronounced. When an overtreatment price vector was posted, customers are 55.56% likely to be overtreated, and 16.84% otherwise. The social expert classification shows that the probability of overtreatment increases with salience but only for selfish experts. Pro-social experts only have an insignificant increase in their likelihood to overtreat, whereas selfish experts are about 38 percentage points more likely to overtreat in ATTENTION.

Customer outcomes

In our experiment, the only decision customers make is whether to interact after observing the prices posted by experts. The trade-off they face is whether to go for a safe outside option of 1.6

ECU or interact and face the risk of being mistreated.

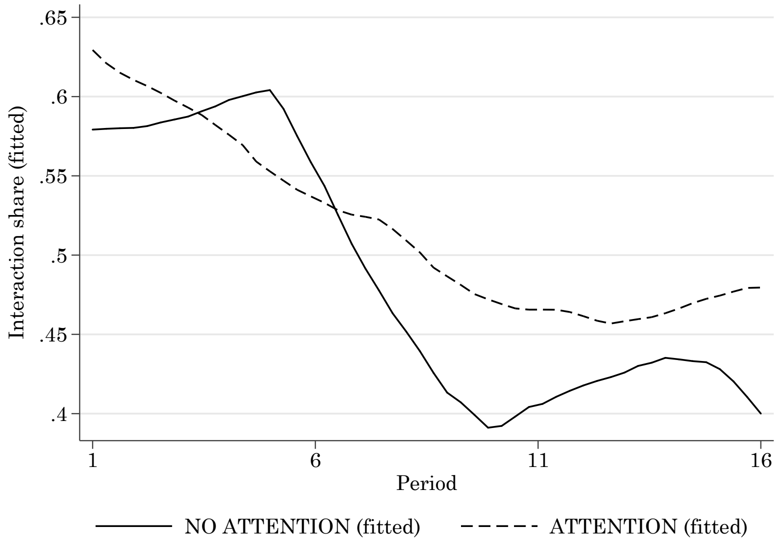

Figure 5: Interaction probability over time.

Note: Fitted values are estimated using Epanechnikov kernels with an optimal bandwidth.

In both conditions, customers interact about half of the time: Interaction rates are 48.44% and 52.08% in NoAttention and Attention, respectively. Table 8 summarizes interaction probabilities depending on the posted price vector: Customers are most likely to interact when undertreatment price vectors are posted. It is in line with our theoretical predictions: When a customer's attention is limited, she perceives an undertreatment price vector as an equal-markup vector, an equal-markup vector as an overtreatment vector, etc. Therefore, when an expert posts an actual overtreatment price vector, it is perceived as a very unattractive offer by customers with limited attention who thus become less likely to interact.

Table 8: Interaction probability by price vector posted (%).

	NoAttention	Attention
Undertreatment vector	50.66	52.47
Equal-markup vector	45.45	49.15
Overtreatment vector	33.33	52.11

As shown in Figure 5, interaction probability has a rather strong time trend. In the early periods, customers are likely to interact, and this probability decreases over time. For example, in the first period, 62.5% of customers in NoAttention and 72.2% of customers in Attention choose to interact, whereas in the last (16^{th}) period, only 33.33% of customers in NoAttention and 50% of customers in Attention choose to do so. Our regression analysis in Table 9 provides evidence that there is no significant effect of salience on interaction probability.

Table 9: Interaction probability.

Interaction	All customers (1)	(2)	(3)	Pro-social customers	Selfish customers
ATTENTION	−0.01	0.01	−0.07	0.10	0.22
	(0.09)	(0.10)	(0.10)	(0.15)	(0.15)
Pro-social market				−0.08	−0.08
				(0.08)	(0.08)
Markup difference	☑	☑	☑	☑	☑
Markup difference $_{t-1}$			☑	☑	☑
Major price	☑	☑	☑	☑	☑
Major price $_{t-1}$			☑	☑	☑
Interaction $_{t-1}$		☑	☑	☑	☑
Sufficient $_{t-1}$		☑	☑	☑	☑
Individual controls	Yes	Yes	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes	Yes	Yes
Number of obs.	960	900	900	480	420

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

Table 10: Welfare.

Welfare	Surplus per condition			Surplus per market		
	Consumers	Producer	Total	Consumers	Producer	Total
ATTENTION	−9.38***	4.89***	−4.50***	−1.31***	0.82***	−0.58**
	(0.57)	(0.34)	(0.49)	(0.34)	(0.19)	(0.23)
Major price	0.10	0.27*	0.37*	-0.38***	0.63***	0.30***
	(0.26)	(0.15)	(0.20)	(0.14)	(0.08)	(0.10)
Markup difference	−0.16	−0.22**	−0.38**	−0.05	−0.27***	−0.30***
	(0.17)	(0.10)	(0.15)	(0.12)	(0.05)	(0.08)
Interaction	−2.90***	0.73	−2.17***	−6.66***	2.17***	−4.46***
	(0.76)	(0.47)	(0.72)	(0.48)	(0.25)	(0.33)
Sufficient	4.26***	−0.48	3.78***	7.95***	-0.55**	7.47***
	(0.81)	(0.50)	(0.74)	(0.49)	(0.27)	(0.34)
Individual controls	No	No	No	Yes	Yes	Yes
Fixed effects	No	No	No	Yes	Yes	Yes
Number of obs.	1920	1920	1920	960	960	1920

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

Welfare

Various key market outcomes, such as markup difference and mistreatment rates, are influenced by attention which can lead to welfare implications. We analyze how welfare differs between conditions, and break it down to customer and expert surplus. In addition to analyzing customers' and experts' profits, we construct a market-level efficiency following Mimra et al. (2016). We calculate efficiency level as cumulative profits in the market less the outside option of all players, and normalize it with respect to the distribution of customers in the respective market, which allows accounting for the random differences in total welfare generated by the severity of customers'

Table 11: Efficiency.

Efficiency	All	Pro-social	Selfish
Attention	0.05***	0.02**	0.11***
	(0.01)	(0.01)	(0.01)
Pro-social market	−0.06***	−0.04***	-0.08***
	(0.00)	(0.00)	(0.00)
Major price	☑	☑	☑
Markup difference	☑	☑	☑
Interaction	☑	☑	☑
Sufficient	☑	☑	☑
Individual controls	Yes	Yes	Yes
Fixed effects	Yes	Yes	Yes
Number of obs.	1920	896	1024

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Robust standard errors in parentheses. Individual controls include age, gender, measures for loss aversion, risk aversion, social preferences, and elicited beliefs. We also include time (period) and market fixed effects.

issues.[10]

We start by analyzing welfare through profits acquired by participants over the course of the experiment and analyze them on the condition and market level. We find that although attention to experts' profits leads to an improvement in a number of market outcomes, cumulative profits go down. Moreover, the loss is driven entirely by the loss in the customer surplus. In contrast, experts benefit greatly from their profits being displayed to customers.

We observe several patterns in total welfare. Total welfare decreases if there is interaction unless it is sufficient, because customers experience a large instant loss from undertreatment. Total welfare remains unchanged if the markup difference increases through $\overline{p}$: In this case, customers lose on average the same amount that experts gain. However, if the markup difference increase comes through the reduction of $\underline{p}$, customer surplus does not change significantly, whereas expert surplus decreases, so total welfare goes down as well.

However, our data also shows that, despite the theoretical probability of customers to have a minor problem is 50%, the minor problem actually arises in 47% and 56% of cases in Attention and NoAttention, respectively. As mentioned above, the severity of the treatment affects crucially the cumulative profits a customer-expert pair can generate, and, thus, it is important to take it into account for estimating efficiency.

We find that efficiency indeed increases if experts' profits are salient to consumers. On average, efficiency increases by 5 percentage points with salience. The effect is significant for sub-samples with different social preferences. However, we find a particularly pronounced efficiency gain from salience for selfish subjects: It accounts for 11 percentage points increase in market efficiency on average.

[10] Given interaction, every customer is randomly assigned to have a major or a minor problem with a probability of 50%. In case of a minor problem, every customer-expert pair can generate at least $(10-p)+(p-6) = 4$ and at most $(10-p)+(p-2) = 8$. In case of a major problem, every customer-expert pair can only generate $(0-p)+(p-2) = -2$ in the worst case and $(10-p)+(p-6) = 4$ in the best case. We thus account for these differences when calculating the market efficiency measure.

5 Conclusion

There exist contradictions between theoretical predictions and empirical evidence on the role of verifiability in the credence goods market. While theory predicts that under certain conditions, verifiability leads to market efficiency, observations from real markets go against this prediction. We are the first to provide theoretical argument and experimental evidence that customer's limited attention plays a role in this inconsistency. Our finding goes in line with recent advocacy for more transparency on experts' pay in credence goods markets, such as healthcare or repair services.

Based on the inherent features of lab experiments on the credence goods market, we set up a model of a monopolistic credence goods market in which customers pay limited attention to expert's costs, resulting in a false assessment of the expert's financial incentives. Our model further assumes that the expert knows that customers pay limited attention to their costs, whereas customers are unaware thereof. Our main hypotheses are that an increase in customers' attention with regard to experts' costs results in (i) a decrease in customer interaction given an undertreatment tariff, (ii) a decrease in the number of undertreatment tariffs and insufficient treatments, and (iii) a smaller markup difference between the major treatment and the minor treatment.

We test the hypotheses in a laboratory experiment and find support for the last two hypotheses. We observe less undertreatment, and experts' price vectors were significantly closer to equal mark-up pricing when expert costs are made salient than when they are not. We do not find strong supporting evidence for the first hypothesis. Interestingly, we observe that interaction given an overtreatment tariff under the salience of experts' cost is much higher than under limited attention. We argue that risk aversion and experimental parameterization might account for this effect. In terms of welfare, the salience of experts' costs leads to an increase in accumulated payoffs. Throughout, we observe a heterogeneity of results with regard to social preference.

Overall, our results suggest that customers' limited attention is a possible explanation for the empirical evidence on the inefficiency of verifiability in credence goods market. Furthermore, our study draws a rather nuanced picture when it comes to the merits of introducing more transparency of experts' costs. We observe a positive effect on undertreatment, markups, and welfare, but we do not find an overall increase in interaction compared to the case without transparency. Hence, increasing transparency might serve customers who choose to interact and all experts, but might do more harm than good to customers who interact less, or refrain from interaction altogether. Taken on its own, our findings explain why providers in healthcare and repair service appear not to object to calls for more transparency. What remains an open question for future research is whether expert providers aim to gain a competitive advantage over their rivals through transparency.

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A Appendix

A.1 Experimental instructions (translated from German)

Thank you for your participation in this experiment. Please do not to talk to any other participants during the experiment. Today’s experiment consists of several parts. Your earning is the total income from these parts. In addition, you will receive a show-up fee of 4 Euros for today’s participation and for answering the questionnaire.

INSTRUCTIONS

2 Roles and 16 Rounds
This experiment consists of **16 rounds**, each of which consists of the same sequence of decisions. This sequence of decisions is explained in detail below.
There are 2 kinds of roles in this experiment: **player A** and **player B**. At the beginning of the experiment you will be randomly assigned to one of these two roles. On the first screen of the experiment you will see which role you are assigned to. Your role remains the same lthroughout the experiment. In your group there are 4 players A and 4 players B.
One player A always interacts with one player B. However, the pairs **change** after each round. That means you will interact with a **new** player (the other role) every round.

All participants get the same information on the rules of the game, including the costs and payoffs of both players.

Overview of the Sequence of Decisions in a Round
Each round consists of a maximum of 3 decisions which are made consecutively. Decisions 1 abd 3 are made by player A, decision 2 is made by player B.

1. Player A chooses one price for action 1 and one price for action 2.
2. Player B gets to know the prices chosen by player A. Then player B decides whether he/she wants to interact with player A. If not, this round ends for him/her.
If yes...
3. Player A (but **not** player B) is informed whether player B is of type 1 or type 2. Player A chooses thereupon either action 1 or action 2. Player B has to pay the price specified by player A in decision 1 for the action chosen by player A.

Detailed Illustration of the Decisions and Their Consequences Regarding Payoffs

Decision 1

- **player A** has to choose between 2 actions (action 1 and action 2) at decision 3.
- **Action 1** costs player A **2 points** (= currency of the experiment).
- **Action 2** costs player A **6 points.**
- Player A can charge prices for these actions from player B who decide to interact with him/her. At **decision 1** each Player A has to **set the prices for both actions**. Only (strictly) positive integer numbers are possible, i.e., only 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 are valid prices.
- Note that the price for action 1 must not exceed the price for action 2.

Decision 2
**Instruction of Decision 2 differs between two treatments.*
(No salience treatment)

- **Player B** gets to know the **prices** of player A for the two actions at decision 1. Then player B decides whether he/she wants to interact with player A or not.

- **If he/she wants to do so**, player A can choose an action at decision 3 and charge a price for that action (see below). **If he/she doesn't want to interact,** this round **ends** for player B and he/she gets a **payoff of 1.6 points** for this round.

(Salience treatment)

- **Player B** gets to know the **prices and profits** of player A for the two actions at decision 1. Then player B decides whether he/she wants to interact with player A or not.
- **If he/she wants to do so**, player A can choose an action at decision 3 and charge a price for that action (see below). **If he/she doesn't want to interact,** this round **ends** for player B and he/she gets a **payoff of 1.6 points** for this round.

Decision 3

- Before decision 3 is made (in case player B choses "Yes" at decision 2) a type is randomly assigned to player B. **Player B** can be one of the two types: **type 1** or **type 2**. This type is randomly determined for each player B **in each new round**.
- With a probability of **50% player B is of type 1**, and with a probability of **50% he/she is of type 2**. Imagine that a coin is tossed for each player B in each round. If the result is e.g. "heads", player B is of type 1, if the result is "tails" he/she is of type 2.
- Every **player A** gets to **know the types of player B** who interact with him/her before he makes his decision 3. Then player A chooses an action for each player B, either action 1 or action 2.
- An **action** is **sufficient** in the following cases:

  a) Player B has type 1 and player A chooses either action 1 or action 2.

  b) Player B has type 2 and player A choose action 2.
- An action is **not sufficient**, if player B has type 2 but player A chooses action 1.
- **Player B** receives **10 points**, if the action chosen by player A is **sufficient**. **Player B** receives **0 point**, if the action chosen by player A is **not sufficient**.
- **At no time player B** will be informed whether he/she is of type 1 or a type 2 player in each round, as well as which action player A has chosen.
- **Player A** charges player B the **price** set out in decision 1 for the action chosen in decision 3.

Payoffs

If player B chose not to interact with any of the players A (*decision **"No"** from player B*), both player A and player B get **1.6 points** for this particular round.

Otherwise (*decision "Yes" by player B*) the payoffs are as follows:

Player A receives the according **price** (denoted in points) he/she set at decision 1 **less the costs** for the action chosen at decision 3.

The payoff of **player** B depends on whether the action chosen by player A in decision 3 was sufficient or not:
a) If the action chosen by player A was sufficient, Player B gets 10 points less the price set in decision 1 for the action chosen at decision 3.
b) If the action chosen by player A was not sufficient, Player B has to pay the price set in decision 1 for the action chosen at decision 3.

At the beginning of the experiment you receive an **initial endowment of 6 points**. With this endowment you are able to cover losses that might occur in some rounds. Losses can also be compensated by gains in other rounds. If your total payoff sums up to a loss at the end of the experiment you will have to pay this amount to the supervisor of the experiment. By participating in this experiment you agree to this term. **Please note that there is always a possibility to avoid losses in this experiment.**

To calculate the payoff of this part, the initial endowment and the profits of all rounds are added up. This sum is then converted into cash using the following exchange rate:

1 point = 25 Euro-cents
(i.e. 4 points = 1 Euro)

You will see all further instruction on the computer screen.

A.2 Questionnaire

The questionnaire at the end of the experiment contains the following items:

1. **Elicitation of beliefs:**
   (Only for sellers)
   When you set the price, did you expect that Player B will decide to interact? (Yes/No)
   Which action (Action 1 or Action 2) would you choose given the following scenarios?
   Price: 3 for Action 1 and 8 for Action 2
   Price: 4 for Action 1 and 8 for Action 2
   Price: 5 for Action 1 and 8 for Action 2
   Price: 6 for Action 1 and 8 for Action 2
   Price: 7 for Action 1 and 8 for Action 2
   (Only for buyers):
   As you decided to interact, did you expect that Player A will choose a sufficient action?
   Which action (Action 1 or Action 2) do you expect Player A to choose given the following scenarios? Price: 3 for Action 1 and 8 for Action 2
   Price: 4 for Action 1 and 8 for Action 2
   Price: 5 for Action 1 and 8 for Action 2
   Price: 6 for Action 1 and 8 for Action 2
   Price: 7 for Action 1 and 8 for Action 2

2. **Risk preference, general risk question:** same wording as in German Socio-Economic Panel questionnaire (SOEP, see, for example, **Wagner2007**)

How do you evaluate yourself? Are you generally a risk-seeking person or do you try to avoid risks? The leftmost box means "not at all risk-seeking" and the rightmost "very risk-seeking". With the boxes in between, you can graduate your statement.

not at all risk-seeking ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ *very risk-seeking*

3. **Risk preference, incentivized choice list:** Subjects make eleven, pairwise decisions between a lottery with a fifty-fifty chance of winning either 2 EUR or 7 EUR and a safe payment. The safe payment increases in 0.5 EUR increments, ranging from 2 EUR to 7 EUR.

4. **Loss aversion** similar to **Karle.2016**.

   You will answer questions related to lotteries. If you accept the lotteries, you can make either a profit or a loss. Below are six different lotteries. For each lottery, you can decide whether to accept or to reject it. If you reject, your payment remains unchanged. If you accept, your earning will make either an additional profit or an additional loss.

   At the end of the experiment, one of the six lotteries will be randomly selected. So you should make every decision as if it were your only decision. The selected lottery is then randomly drawn to determine whether the additional profit or loss will be realized for you.

   (All with the same options: Accept or Reject)

   Lottery 1: With a 50% probability you lose 2 EUR and with a 50% probability you win 6 EUR.

   Lottery 2: With a 50% probability you lose 3 EUR and with a 50% probability you win 6 EUR.

   Lottery 3: With a 50% probability you lose 4 EUR and with a 50% probability you win 6 EUR.

   Lottery 4: With a 50% probability you lose 5 EUR and with a 50% probability you win 6 EUR.

   Lottery 5: With a 50% probability you lose 6 EUR and with a 50% probability you win 6 EUR.

   Lottery 6: With a 50% probability you lose 7 EUR and with a 50% probability you win 6 EUR.

5. **Social preference** (**Falk2018**)

   Question 1: Imagine the following situation: Today you unexpectedly received 1000 EUR. How much of this amount would you donate to a good cause? (Values between 0 and 1000 are allowed).

   Question 2: Please think about what you would do in the following situation. You are in an area you are not familiar with, and you realize that you lost your way. You ask a stranger for directions. The stranger offers to take you to your destination. Helping you costs the stranger about 20 EUR in total. However, the stranger says he or she does not want any money from you. You have six presents with you. The cheapest present costs 5 EUR, the most expensive one costs 30 EUR. Do you give one of the presents to the stranger as a "thank you" gift?

Which present do you give to the stranger?

1. No, would not give present
2. The present worth 5 EUR
3. The present worth 10 EUR
4. The present worth 15 EUR
5. The present worth 20 EUR
6. The present worth 25 EUR
7. The present worth 30 EUR

6. **Description of reasoning for decisions**

   (Only for sellers)

   Please answer the following questions:

   How did you decide for the prices? Please describe what you thought when you set the prices.

   How did you decide for the actions? Please describe, what you thought when you choose the action.

   Did you change your strategy across periods? When yes, why?

   (Only for buyers)

   Please describe your thought when you made the decision whether or not to interact.

   Did you change your strategy across periods? When yes, why?

7. **Socio-demographics:** age, gender, final grade point average at academic high school, last math grade at academic high school, field of study, monthly disposable amount of money, political orientation, number of experiments already participated in the same lab.

A.3 Exemplary screens of stage decisions

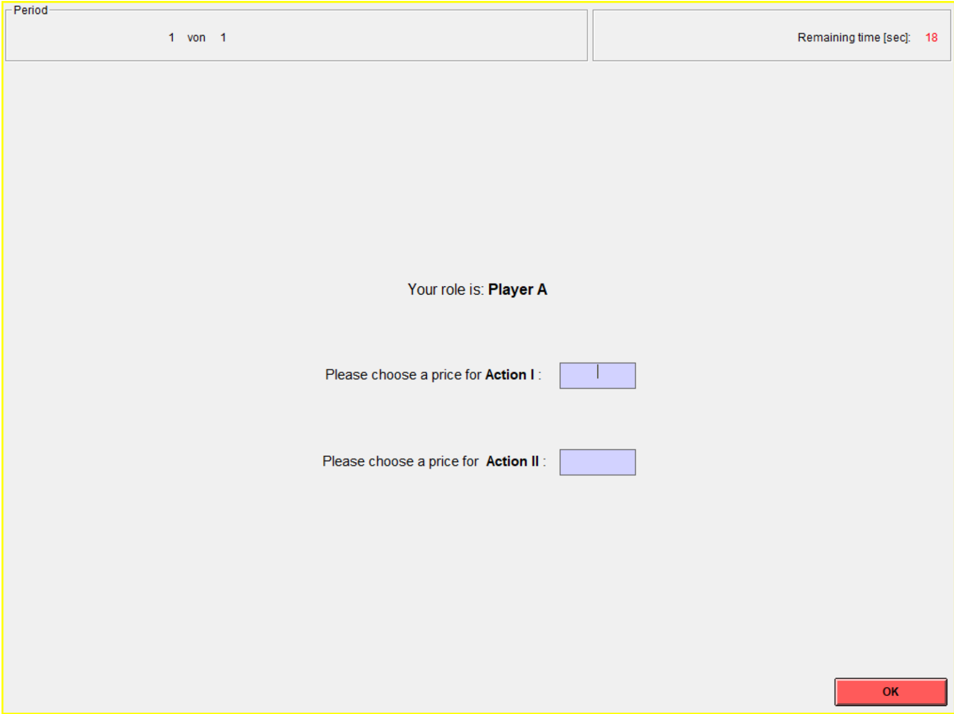

Figure 6: Exemplary screen (both treatments): experts set prices

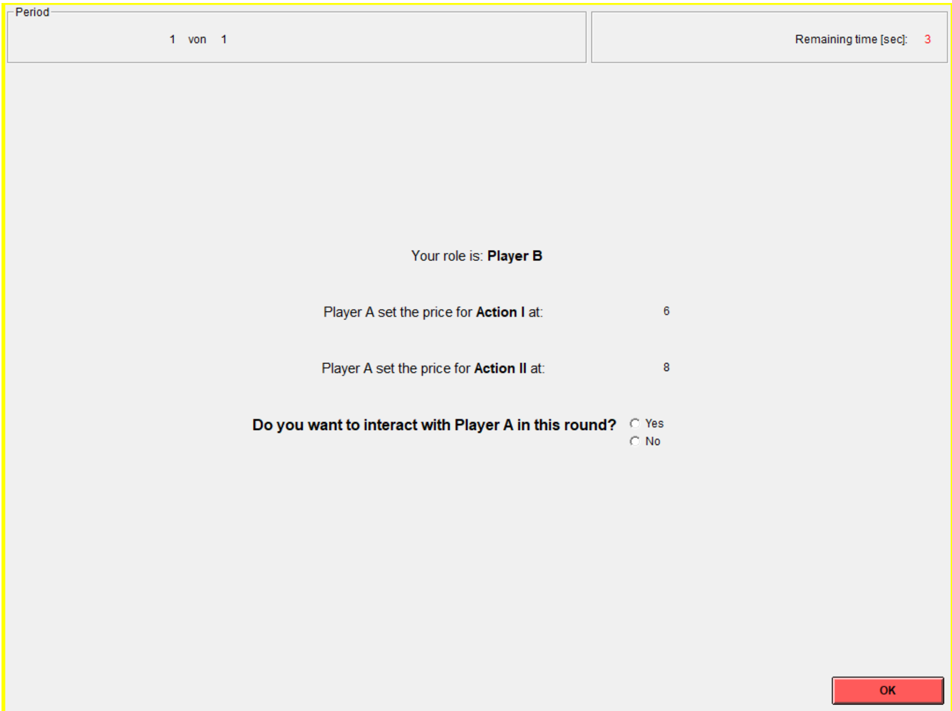

Figure 7: Exemplary screen (treatment No Salience): Customers observe prices and decide on interaction

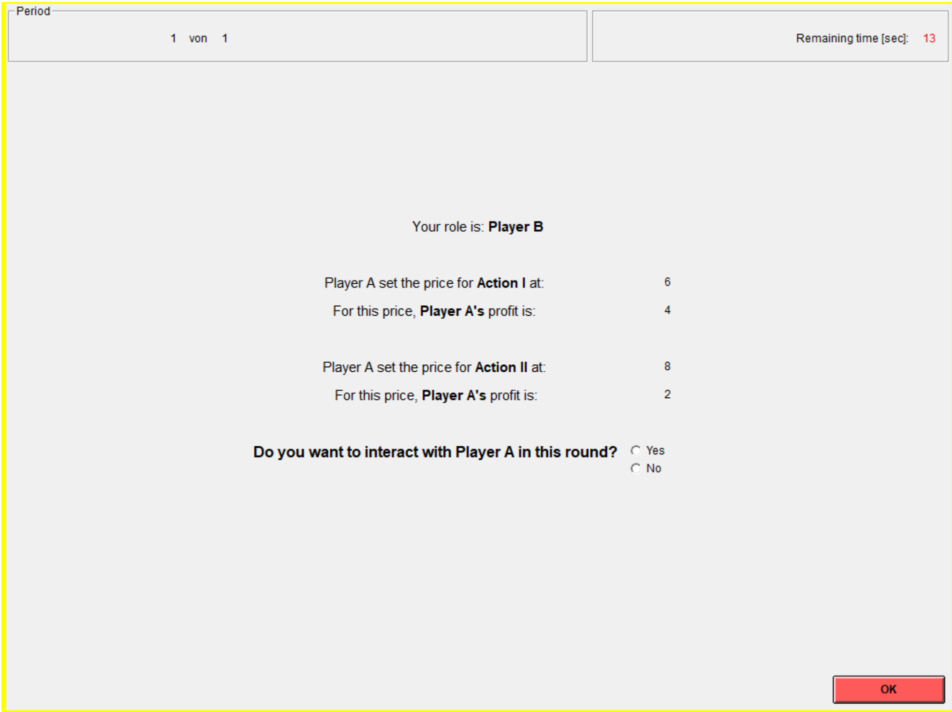

Figure 8: Exemplary screen (treatment Salience): Customers observe prices and profits, and decide on interaction

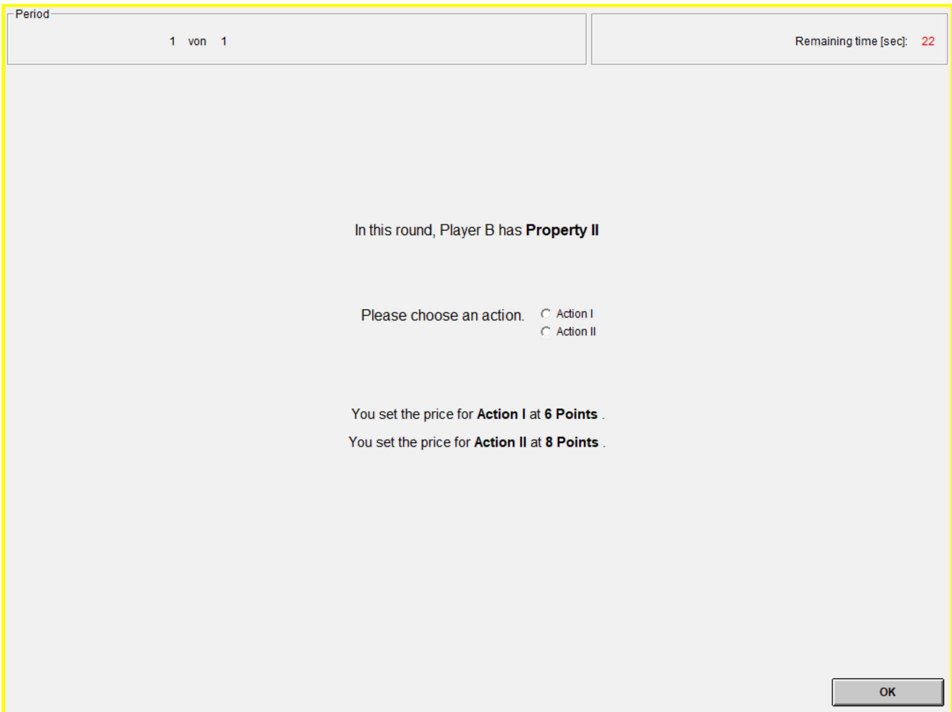

Figure 9: Exemplary screen (both treatments): Experts choose condition