

# An Economic Lab Experiment for the Best Offer and Approval in Face-to-Face Service Interaction Situation

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**Abstract.** This article investigates what types of social distance affect the best offer from an employee and its approval from a customer in general service situation. We conduct the deception game (Gneezy, 2005) and investigate the effects of the social distance (face-to-face vs. anonymous interaction) in a laboratory experimental economics method. We observed increases in the rate at which employees made best offers and the rates at which customers accepted offers when face-to-face interactions were conducted. But a statistically significant difference was not observed. Also, the level of trust in others reported by the subject playing the role of the employee had a statistically significant positive effect in cases in which the employee made a best offer. It was also observed that, regardless of whether the interaction was conducted face to face or anonymously, if the subject playing the role of the customer exhibited a low level of tolerance for falsehood, he or she was less likely to accept offers.

**Keywords:** Economic experiment, Deception game, Trust, Service management

## 1 Introduction

The exchange between employees and customers is the minimum level of behavior necessary to create a typical service. In many cases, a service occurs when an offer from a company through an employee is accepted by a customer. For instance, a variety of everyday cases qualify as a service, such as the offer of a special menu and its acceptance by a customer in a restaurant, or the offer of informative documents about a type of medical care and the subsequent consent of the patient. As services are intangible, simultaneous, diverse, and perishable, the fact that a customer does not fully understand the value of the service that he or she receives creates a dilemma. It is exceptionally difficult for a customer to discern whether a service offered by an employee represents his or her best interest, or whether it prioritizes the employee's profits. Thus, in the offer and acceptance of services by an employee and customer respectively, information is held asymmetrically. This asymmetry of information may create an incentive for the employee to offer a service that is beneficial to itself but not necessarily in the customer's best interests. In modern society, frequent reports of instances in which

first-class hotels or expensive restaurants have deceived their customers about the quality of the food they serve provide a classic example of a case in which employees have taken advantage of a customer's trust and offered services that prioritize their own profits. This is a form of fraud. Due to the asymmetry of information between the employee and the customer, services always involve this problem of deception. In this research, we focus on possible incentives for employees to deceive customers about the quality of their services, and perform economic experiments that investigate the influence of social distance between the customer and the employee.

In a demonstration experiment using Australian wine, Lacey et al. (2011) received responses indicating that, when ordering wine, customers depended as much on the offer of a service, in this case a recommendation from an employee, as they did on the taste of the wine or information such as where the wine was produced. This result implies that, in response to the uncertain nature of the wine, a recommendation from the employee had a strong effect on the customer's likelihood to order the wine.

As research on services often does not involve the mediation of specific goods, in this research we have used a deception game per Gneezy (2005), a type of experiment in which goods are not mediated. In the original study, a sender chooses to send either a true or a deceptive message containing receiver's payoffs in the two options that detect actual payoffs between two subjects. Gneezy discovered that higher stakes achieved by lying induce a higher fraction of lying. This result implies that the employee has an economic incentive to deceive when the customers do not know the true value. This game formation is a principle of the real service situation so that we focus on this game.

We compare the distribution of the honest behavior (the employee's best offer from to customer in the aspect of customer's profit) and the customer's approval under the social distance (anonymity vs. face-to-face interaction situation). The social distance is represented by the degree of anonymity between senders and receivers. According to Roth (1995), face-to-face communication, one of the central issues in social interaction, encourages cooperative behavior in public goods games (Isaac and Walker, 1988; Brosig et al., 2003; Bochet et al., 2006) and prisoner's dilemma games (Frohlich and Oppenheimer, 1998; Bohnet and Frey, 1999b). It also increases offers in dictator games (Bohnet and Frey, 1999a, 1999b; Burnham, 2003; Charness and Gneezy, 2008).

In the trust game, Scharlemann et al. (2001) showed that a facial expression elicits cooperation under non-verbal communication environment. Holm and Kawagoe (2010) employed a bluffing game in which subjects played cards to deceive their counterparts. They discovered that lifting anonymity between players reduces lying. No study has evaluated the effects of social distance by using the deception game. However, we can refer to Sutter (2009), who found that groups are less likely to lie than individuals. This result implies that lifting anonymity among the senders reduces lying.

On the basis of the arguments above, we suggest a hypothesis: lifting anonymity increases the honest behavior. Since reducing social distance encourages an emphasis on others, lifting anonymity increases senders' beliefs for earning approval from the receivers, or it makes them less willing to let receivers down. On the other hand, the effect of increased cooperative behavior suggests the hypothesis: lifting anonymity enhances approval.

Also, the socio-economic background has various demographic components, such as age, gender, or income. To investigate the effects of these various components,

Gächter et al. (2004) found students to be less trusting than non-students in the trust game. In the deception game, only the difference of gender has been considered as an effect of subject type. Dreber and Johannesson (2010) found that men are more likely to lie than women in situations with small stakes, while Childs (2012) found no difference between genders in situations with large stakes.

The remainder of the paper is organized as follows. Section 2 presents the experimental design and procedures. Section 3 analyzes the results. Section 5 discusses and Section 6 summarizes the conclusions.

## 2 Experimental design and procedures

### 2.1 Design

We replicate the deception game (Gneezy, 2005). The subjects were allocated to separate rooms, designated as Rooms A and B. Subjects in Room A are randomly matched with subjects in Room B. Subjects in Room A plays the role of senders (employees), and subjects in Room B plays the role of receivers (customers).

Only senders are informed about the monetary payoffs for the two different options, A and B, as follows:

Option A: 1500 yen to you and 500 yen to the other student

Option B: 500 yen to you and 1500 yen to the other student

Receivers know only that there were two options, A and B, but do not know the context. Then, the senders send receivers one of the two messages below:

Message 1: Option A will earn you more money than Option B.

Message 2: Option B will earn you more money than Option A.

Message 1 is the best offer from the employee to the customer. If the receiver chooses Option A (B) as the response to Message 1 (2), he or she approves the offer from the customer. Receivers receive the messages and choose one of the two options. Receivers know nothing but the amount of money they will earn at the end of the experiment. Therefore, receivers cannot judge whether the sender has told a lie.

### 2.2 Procedures

We conducted the laboratory experiments at Osaka University. No one participated in more than one session. The anonymity treatments proceeded in the following steps:

1. Subjects gathered in one room before the experiment. The experimenter read a consent form aloud in front of the subjects. The subjects were then divided by a lottery into two rooms, A (senders) and B (receivers) as in Figure 1.
2. Senders and receivers were given separate instructions and read them silently and independently. Senders were given two cards with Messages 1 and 2. Receivers were given two cards describing Options A and B.

3. Senders inserted one card (Message 1 or 2) into an envelope. The experimenter delivered the envelope to the paired receiver in the other room. The receiver read the message and inserted a card (Option A or B) into the envelope. Then, everyone answered a short questionnaire about their expectations.

In the face-to-face treatment, the third step were customized. Each pair moved to a common space and stood face to face across a table separated by a partition to prevent receivers from seeing senders' decisions as they were being made as in Figure 2. Senders inserted one of the two cards (Message 1 or 2) into an envelope and then personally handed it to their paired receiver. Verbal communication was prohibited during this procedure. After returning to their original rooms, receivers read the message and inserted one of two cards (Option A or B) into the envelope, which the experimenter then delivered.

After this procedure, we investigate the effects of four types of variables self-reported in the questionnaire. The first type includes demographic variable, such as gender, age, and income. This is also used for evaluating differences in socio-economic backgrounds between students and non-students. The second type is a psychometric scale such as General Social Survey (GSS) scales and trust scales used in many previous studies. The third type, employed only in the face-to-face treatment, includes information about acquaintance levels, subjects' impressions of their partners, and paired gender effects. These variables can be used to check social distance in each pair. The definitions of the variables we employed in this paper are summarized in Table 1.



**Fig. 1.** Subjects in Room A



**Fig. 2.** Face-to-face interaction

**Table 1.** Questionnaires

GSS	Normalized sum of de-meaned normalized and resigned GSS fair, GSS help, and GSS trust <i>GSS fair</i> : “Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?” <i>GSS help</i> : “Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?” <i>GSS trust</i> : “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?”	1: Would take advantage of you; 2: would try to be fair; 1.5: depends; -: no answer/don’t know 1: Try to be helpful; 2: just look out for themselves; 1.5: depends; -: no answer/don’t know 1: Most people can be trusted; 2: can’t be too careful; 1.5: depends; -: no answer/don’t know
TrustBehave	Normalized and resigned sum of normalized Door unlocked, lend money, and lend possessions <i>Door unlocked</i> : “How often do you leave your door unlocked?” <i>Lend money</i> : “How often do you lend money to friends?” <i>Lend possessions</i> : “How often do you lend personal possessions to friends?”	1: Very often; 2: often; 3: sometimes; 4: rarely; 5: never 1: More than once a week; 2: once a week; 3: once a month; 4: once a year or less 1: More than once a week; 2: once a week; 3: once a month; 4: once a year or less
TrustStranger	You can’t count on strangers anymore	1: More or less disagree ; 0: More or less agree

TrustWorthi- ness	I am trustworthy	1: Disagree strongly; 2: Disagree somewhat; 3: Disagree slightly; 4: Agree slightly; 5: Agree somewhat; 6: Agree strongly
Re-pair	Do you want to be paired with the same person to share money even if he/she tells a lie?	1: Yes; 0: No
Re-pair2	Do you want to be paired with the same person after receiving the mes- sage?	1: Yes; 0: No
S_Known*	Relation to Role B	1: I have never seen him/her before; 2: I have seen but never talked to him/her; 3: I just ex- change greetings with him/her; 4: I talk with him/her sometimes; 5: I often talk with him/her; he/she is a good friend of mine
S_Impres- sion*	How do you feel about Role B?	1: Not good at all; 2: Not very good; 3: Nei- ther good nor bad; 4: Good; 5: Very good
R_Known*	Relation to Role A	1: I have never seen him/her before; 2: I have seen but never talked to him/her; 3: I just ex- change greetings with him/her; 4: I talk with him/her sometimes; 5: I often talk with him/her; he/she is a good friend of mine
R_Impres- sion*	How do you feel about Role A (B)?	1: Not good at all; 2: Not very good; 3: Nei- ther good nor bad; 4: Good; 5: Very good
Pair_MM*	Sender/receiver pairings	1: Male with male; 0: Others

Notes: \* these variables are employed in the face-to-face interaction only.

### 3 Results

We conducted a total of 10 sessions with 200 students. The sessions lasted for 40–60 minutes. Each session consisted of 4–26 subjects, and they earned an average of approximately 1,500 JPY. Females were 38% of students. The average age was 20.1 years for students.

Figure 3 shows the proportion of offers from the employee's side that were beneficial to the customer ("best offers") and the ratio of approvals, i.e. ratio of customers who accepted what they were offered. These ratios are organized by whether the experiment involved face-to-face or anonymous interactions. In the results of the experiment, the ratio of best offers was 0.62 for face-to-face and 0.51 for anonymous interactions, so employees were more likely to make a best offer in face-to-face interactions. However, the results of Fisher's exact test did not exhibit statistical significance ( $p = 0.17$ ). The rate of customer acceptance was 0.71 for face-to-face and 0.64 for anonymous interactions, again showing a higher ratio for face-to-face interactions. However, as before, the results of Fisher's exact test did not exhibit statistical significance ( $p = 0.42$ ). In the interactions between students, a statistically significant difference based on whether an interaction was performed face to face or anonymously was not observed.

Next, we focus on the social attributes of the subjects, which are factors separate from the purposefully controlled environment in which the interactions took place. Here, in addition to basic data such as gender, household, and age, we used answers to the GSS and questions related to psychological factors such as trust in others, reliability

of behavior, and self-reliance as representative variables for social capital, which was itself used as a representative variable for social distance. Furthermore, for experiments conducted as face-to-face interactions, we included partner impressions and levels of familiarity between partners as variables. Also, in measuring customer acceptance, we introduced a variable representing tolerance for the pair’s falsehood.

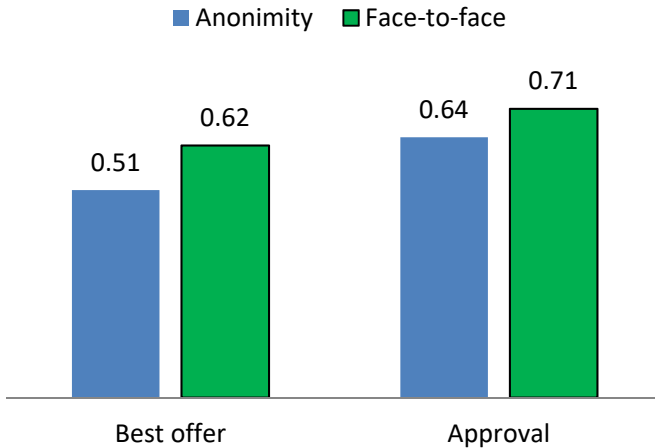


Fig. 3. Proportions of best offer and approval

With these as explanatory variables, and with the likelihood that an employee would make a best offer and the likelihood that a customer would agree to an offer as response variables, we performed a logit analysis. Tables 2 and 3 show the results. Concerning the likelihood of a best offer being made by an employee, in the anonymous interaction there were no statistically significant variables. In the face-to-face interaction, the only variable showing significance was TrustStrangers, with a p-value of 10%. This indicates that, in face-to-face interactions, the degree to which an employee trusted others corresponded to the rate at which they would submit a best offer. That is, in face-to-face interactions, a subject’s trust in others had a strong effect. On the other hand, other variables, such as the impression a partner made (S\_impression), did not show this effect. This indicates that the psychology of the party making the offer is the source of this effect.

Next, with regards to whether the customer accepted an offer or not, in the anonymous interaction, rather than trust scales, we found that Re-pair (tolerance for falsehood) had a negative effect with a p-value of 5%. The degree to which a person asserted that they would not tolerate someone lying to them corresponded to the likelihood that they would not agree to an offer. This tendency also appeared in face-to-face interactions as a significant factor with a p-value of 1%. The customer’s tolerance for falsehood had a very strong effect on whether he or she would accept an offer. This appears to represent the extent to which a customer will be vigilant of, be conscious of the risks associated with, and be tolerant of a fraudulent offer from an employee in a real situation. Furthermore, in the face-to-face interactions, age showed a negative effect with a p-value of 5%. We found that how old a subject was corresponded to how

readily they would refuse offers from an employee. As our subjects were undergraduate and graduate students, the range of possible ages was not large, but we still found that older subjects were less likely to accept offers. On the other hand, levels of trust, partner impressions (R\_Impression), and degree of partner familiarity (R\_Known) had no effects.

**Table 2.** Logit regressoin for lying

	Anonymous interaction	Face-to-face interaction
Female	0.40 (0.51)	0.13 (0.53)
Household	-0.14 (0.18)	-0.02 (0.13)
Age	0.04 (0.09)	-0.09 (0.12)
GSS	-0.07 (0.24)	-0.04 (0.22)
TrustBehave	-0.24 (0.25)	-0.26 (0.21)
TrustStranger	0.01 (0.54)	0.75* (0.41)
Trsutworthiness	-0.08 (0.19)	0.09 (0.15)
S_Known		-0.27 (0.21)
S_Impression		0.37 (0.26)
Men&Men		0.17 (0.53)
Constant	-0.35 (2.07)	0.52 (2.84)
Psedo R2	0.03	0.05
# of Obs.	70	129

Notes: Standard errors are in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

**Table 3.** Logit regression for approval

	Anonymous interaction	Face-to-face interaction
Female	0.43 (0.60)	-0.42 (0.65)
Household	0.00 (0.17)	0.13 (0.15)
Age	-0.04 (0.13)	-0.31** (0.14)
GSS	0.08 (0.32)	-0.09 (0.27)
TrustBehave	-0.31 (0.29)	0.10 (0.28)
TrustStranger	-0.19 (0.61)	-0.53 (0.47)
Trsutworthiness	0.04 (0.26)	0.31 (0.19)
Repair	-1.14** (0.57)	-1.84*** (0.48)
R_Known		0.68* (0.35)
R_Impression		0.02 (0.30)
Men&Men		-0.62 (0.68)
Constant	1.78 (3.14)	6.22** (3.14)
Psedo R2	0.09	0.18
# of Obs.	68	129



Notes: Standard errors are in parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

## 4 Discussion

The fraction of lies in our observation is consistent with original study of Gneezy (2005), who found that larger stakes for students in the anonymity condition induced a higher fraction of lying. Fractions of trust were more than 0.6 for both treatments, which is consistent with the original study of Gneezy (2005), who found more than 60% of receivers trust messages. Lifting anonymity reduces the frequency of lying and non-approval but it does not have significant effects. This observation was consistent with Holm and Kawagoe (2010), who found that the face-to-face treatment reduces the fraction of lying. Our result implies a possibility that face-to-face communication closes social distance and enhances altruistic behavior. To see more robust statistical result as shown in Holm and Kawagoe (2010), it is needed to gather more data from subjects with various socio-economic background.

The logit analysis indicates what the most important measures of trust are. More than how well the subjects playing the employees knew the customers, or what sort of impression they made, the internal, psychological factor of how trusting they were of others generally had the most powerful effect. This indicates that they were not thinking of how their partner would respond to a fraudulent offer, but rather pondering larger questions about whether they could trust other people. According to these results, which indicate that trust in others has a strong effect on offers of service, it will be difficult to get employees to make best offers to customers simply by relying on their independence and human nature. Our research implies that employees must be educated in the best way to make an offer, and, more importantly, in the human and the mental aspects of offering services.

On the other hand, whether an offer was accepted or not was strongly reliant on the customer's tolerance for falsehood, regardless of whether customer acceptance occurred in face-to-face or anonymous interaction. This implies that customers always viewed offers with suspicion. The degree to which customers would not tolerate being lied to corresponded to how unlikely they were to agree to an offer. This implies a dislike of being deceived. In this experiment, subjects playing the role of customers did not know how benefits were distributed between themselves and the employee, and so made decisions based solely on messages received from the employee about what would benefit them. As such, whether they accepted an offer or not was a simple expression of whether they were willing to believe the employee. People who hated being lied to did not want to agree to the employee's offer. It appears that, more than the actual message from the employee, they disliked the possibility of trusting the employee and then being betrayed, and made decisions that opposed the employee as a result.

A customer's choice to accept a service was strongly affected by their own tolerance for falsehood. Conversely, this implies there are some people who will continue to frequent expensive restaurants or first-class hotels that lie about the food they serve. If customers are tolerant of falsehood, they will believe and agree to whatever the employee offers them. However, from the employee's perspective, regardless of whether they take pains to make best offers, they may offend their customers if their

offer is not believed. In the long run, they may damage their customers' trust. By demonstrating that the customer is not being lied to, they can make clear that they are offering a genuine service. For example, in a restaurant, this would be accomplished by having things like an open kitchen or a broadcast showing the activity in the kitchen, therefore ensuring that the food preparation process is transparent. Due to this problem of trust, systems and methods by which to reassure the customer become issues of importance.

## 5 Conclusions

In this experiment, we observed increases in the rate at which employees made best offers and the rates at which customers accepted offers when face-to-face interviews were conducted. As a statistically significant difference was not observed, the next topic of investigation will be to collect data from a broader sample set. Also, the level of trust in others reported by the subject playing the role of the employee had a statistically significant positive effect in cases in which the employee made a best offer. It was also observed that, regardless of whether the interaction was conducted face to face or anonymously, if the subject playing the role of the customer exhibited a low level of tolerance for falsehood, he or she was less likely to accept offers. Our research indicates that, in service interactions between employees and customers, the importance of trusting relationships is unambiguous. Trust in others and tolerance for falsehood have clear effects on such interactions.

However, as our sample was composed of students, it lacked variation in terms of social attributes, and each of the variables that we used to measure social distance also lacked variation. In future experiments, it will be important to include even more variables related to social capital such as feelings of trust, isolation, and loneliness, and also to assemble a sample with a broader range of age brackets. We expect our next topic to include an experiment asking whether having a person lie to a customer, apologize, and be forgiven will build a trusting relationship. Based on such an experiment, it may be possible to understand how long-term relationships of trust that occur in service interactions are established. In this sense, the results of this experiment have shed new light on how trust is established between employees and customers in the offering and consumption of services.

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