

How Free is Your Lunch: Evidence from an “Eat-as-you-want-pay-as-you-wish” Restaurant

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Abstract

In this paper I present the results of an experiment conducted in a pay-as-you-wish restaurant. The restaurant lies in Vienna’s 9th district, near the city center, and applies the following pricing strategy: costumers can eat whatever they want and pay whatever they wish (including zero, excluding negative prices). People contribute positive amounts that more than cover the costs of running the place. The restaurant opened in 2005 and has recently expanded its activity, enlarging capacity by 9 tables. I evaluate a pricing strategy that - according to the owner - relies on peoples fairness norms. I conduct a framed field experiment to find evidence of motivations on peoples payment behavior. I use survey paired with direct observations of the payment using different treatments, that help to distinguish different levels of communication. Further data on payments from day to day business analyze whether the presence of experimenters changes the distribution of payments. I find that costumers are strongly motivated to pay by their second order expectations over the owner’s expectation of adequate payment and that the presence of an experimenter does not alter the payment behavior.

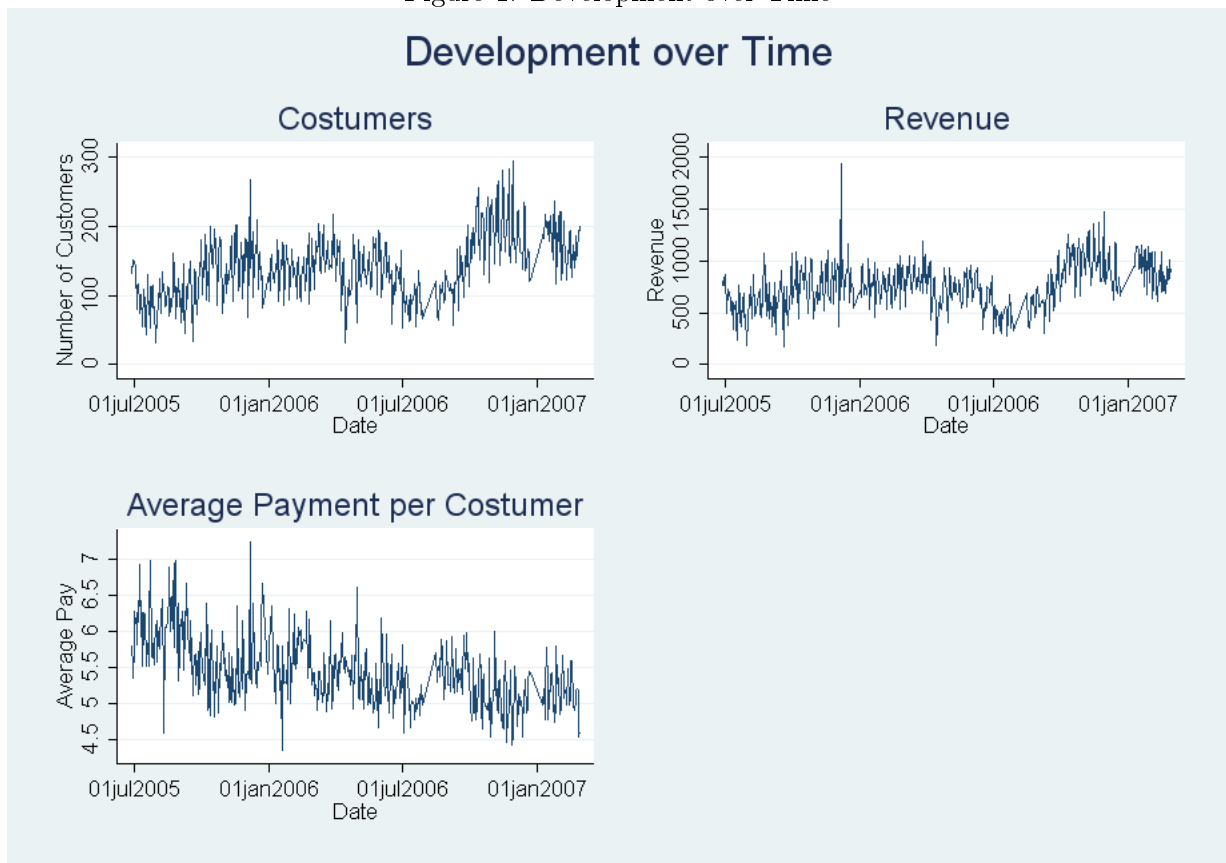
1 Introduction

Restaurants have been of scientific and anecdotal interest to economists probably not only since the conversation between Gustav von Schmoller and Vilfredo Pareto, where according to the legend the famous phrase “there is nothing like free lunch” was coined ¹. In this paper I analyze a restaurant, that applies following pricing scheme: *Eat What You Want, Pay as You Wish*. It is located in Vienna’s 9th district, near the city center and Vienna University’s main building and is named *Der Wiener Deewan* (henceforth DWD). The restaurant opened in June 2005 and has recently expanded its activity, enlarging capacity by 9 tables. Opening times are from Monday to Saturday 11am-11pm. During this time 140 to 160 costumers are served per day. Food is served buffet-style near the main entrance of the location, where the counter is located as well. Drinks have to be paid separately because of tax

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¹For a nice discussion of this see [Vohra \[2005\]](#)

Figure 1: Development over Time



reasons. The payment process works as following: after consumption people go to the counter at the entrance and pay for the drinks and pay a voluntary amount to the person at the till for the food. The phrase that is used to induce people to pay is “zero plus” (or variants thereof in German). The quality of food is high and according to several big newspapers, it is one of the best curry huts in Vienna.

Figure 1 shows the development of average payments, revenues and costumers since July 2005. Payment behavior over the last three month indicates that the median payment per customer was 5 Euros where the minimum was 0 and the maximum was 50 Euros. From a neo-classical point of view of consumer choice, the prediction of customer’s contributions should be zero. While this observation is straightforward in a one shot game however, even in a repeated game with neoclassical preferences would be unable to describe observed behavior. No customer, no matter how often she eats there, is pivotal to the existence of this place. Therefore, given the strategy of the others, the optimal strategy would be to contribute nothing, therefore positive contribution can not be an equilibrium.²

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These observations lead directly to the main question of this paper: Why does such a place exist and what are the motivating factors for the costumers to contribute? A question that is in interest of the owner is, whether it is necessary that a person collects the money at the counter or whether the intrinsic motivation for most of the people is strong enough to let them pay quasi unobserved and extrinsically motivated into a box. The strategy applied is a combination of questionnaire on personal

²However, pay-as-you-wish payment concepts have been employed by similar restaurants in Berlin (the so called *Weinereien*) and on October 10 2007 *Radiohead* released their first pay-as-you-wish album.

characteristics and direct observation of the payment behavior under different treatments. The four treatments differ in the information provided to the costumers and the communication structure, in order to elicit the role of communication and social information on behavior within this context. The results suggest that guilt is strong enough to prevent people from paying at all. However, as I can not exclude a an experimenter communication effect completely, I would refrain from suggesting that they should abandon the person at the counter completely.

1.1 Some related literature

Gift exchange has been described earlier in the economics literature by [Akerlof \[1982\]](#) and they have been experimentally tested among others by [Fehr et al. \[1993\]](#). In the consecutive years numerous experiments have been conducted mainly in the context of labor markets and charities. The main concern was how agents react when faced with contracting problems and low powered incentives. The case of exchange of private goods has more often been described in the sociological and anthropological literature [see [Henrich et al., 2004](#), for a collaborative effort of economists and anthropologists to elicit social preferences in non western societies], starting in modern times from the contribution of [Mauss \[1924\]](#) in his "Essai sur le Don".

Most closely related to this project is the literature on social norms of tipping (e.g.. see [Azar \[2005\]](#) for a survey and [Conlin et al. \[2003\]](#) for a field experiment, where they argue that tips are a method for solving monitoring problems). [Gautier and van der Klaauw](#) study a promotion of a Spanish hotel chain in Belgium and The Netherlands, where people could pay what they liked for a room at a particular weekend. Their main concern was the selection into this experiment and the reaction of regular costumers. Other studies that involved food in experimental setups are [Rutstroem \[1998\]](#) who looked at the auction of chocolate and showed that different auction designs that are isomorphic in theory, lead to different outcomes in the experiment and [Kiefer et al. \[1994\]](#) who investigated pricing schemes and elasticities of a particular dish on a menu, and they found out that it is not very elastic, and so restaurant owners are not setting their prices optimally. Only very recently studies used controlled data from the field: [Falk \[2007\]](#) studied the effect of gifts included with solicitation letters of a charitable organization. People respond to larger gifts with higher payment in charitable donations and do not substitute their givings over time.

An extensive treatment of the theories behind the motivations for giving brought forward in this paper provides [Camerer et al. \[2004\]](#). On the hypothesis of guilt aversion [Charness and Dufwenberg \[2006\]](#) is a useful source on the experimental side. A recent contribution by [Benabou and Tirole \[2006\]](#) that nests different models of pro-social behavior and incomplete information over types. My study contributes to the literature on gift exchange where a *private* good is exchanged for money contrary to the many studies on charitable contributions and public goods.

2 Experimental Design and Data

I consider four different treatments that differ in the extent of communication and information. All treatments will include the same type of questionnaire and additional information will be provided,

depending on the treatment. Sampling occurs in three dimensions: location of the table, time of the day, day of the week. we conducted 12-30 interviews at lunch time and 14-33 at dinner per day from June 1 2007 to June 9 2007 (see table 3) for each treatment. Every person at a table is exposed to the same treatment to avoid confusion and so reduce communication about the experiment at the table. Tables and treatments are randomly chosen. Randomization over treatments helps to wipe out unobservable effects of days and time, that we would get if we ran treatments separately at different dates. The questionnaire is filled out by the test person before the payment. The questionnaire sheets are coded with table numbers and time of handout to identify people who sat together at a table.³

According to the taxonomy of [Harrison and List \[2004, pp. 1012-1014\]](#) I can place this work between *framed field experiment* and *natural field experiment*: The *nature of the subject* pool is non-standard. Everybody can take part, however there might be self selection. *Information* subjects bring to the task is might differ, first there might be costumers who go there for the first time and therefore do not know what to expect and second there are regular costumers who already have established trading norms. Therefore one question of the questionnaire is whether people have already visited this restaurant and how frequently the go. The *good* in this case is not abstract but very real and known and essential to everybody in this world: food. The nature of the stake is most comparable with laboratory experiments: it is on a rather small scale not of several hundred euros but 0 to 20. The *environment* is the field and not the classroom.

Along the lines of [Shang and Croson \[2006\]](#) field experiments have several limitations: One can demonstrate that an effect exists but not necessarily why it exists (can be remedied with proper treatments). There is lack of control of the subjects compared to laboratory experiments. This will problem is of lesser concern in my project. The second limitation is more severe: the generalisability of results (similar problem to outside validity in lab experiments). Probably the effect studied only works in the framework studied, because subjects select into this according to some unobservable variables. This makes it harder to deduct more general statements of human behavior.

2.1 Data Collection

Questionnaire

The questionnaire consists of one DIN A4 page of questions and half a page of instructions and additional treatment dependent information (A German version of it can be found in the Appendix [A.1](#)). The shortness of the questionnaire ensures high response rates and more accurate reporting of information. The information provided in the questionnaire can be split into four categories: (1) quality and quantity of food consumed, (2) the costumers relationship with and knowledge about the restaurant (3) beliefs over production costs and second order beliefs over owner's expectations and (4) General personal characteristics (age, occupation, other restaurants visited). To identify eventual reciprocity I included a hypothetical question on how people would alter their contribution as a response to a quality change.

³As we get the information on individual co-variates and the actual decision simultaneously it is not possible to assign treatments randomly to people with the same co-variates.

Treatments

In *treatment 1* the interviewer hands out the questionnaire at the table. Handing out questionnaires happened after people have eaten some food, as this increases the response rates dramatically as we found out during the pilot. She asks the interviewee to fill out the questionnaire and hand it in together with the contribution at the counter. At the counter the person usually in charge of collecting the payments is present to handle money and questionnaires, inducing the costumers to pay with the usually used phrase “Zero plus”. She records the amount contributed on the questionnaire. I will refer to this treatment as the *full communication* treatment.

In *treatment 2* the distribution of the questionnaires is the same as in the full communication treatment. The money has to be put into an envelope attached to the questionnaire. This will then be allocated into a box near the entrance.⁴ This guarantees that there is limited influence of the restaurant owner or a representative during the payment process. I will refer to this treatment as *limited communication treatment*.

Treatment 3 Is the same as the full communication treatment, but subjects are provided with information of averages of previous costumer’s payments conditional on food consumed (vegetable curries, meat curries or both). The data we took from the pilot study where costumers paid significantly more (6 Euros on average) than on a normal day (on average 5 Euros in February 2007). We make this information common knowledge by reading out those averages aloud at each table, as [Chaudhuri et al. \[2006\]](#) found out that advice that is made common knowledge has an impact on peoples behavior in a public goods game. like in [Shang and Croson \[2006\]](#) on charitable giving. I will refer to this treatment as *full communication with social information* treatment. *Treatment 4* is the same as treatment 3 with the communication structure towards the owner like in treatment 2.

Data from the Field In order to get external reference points on which people could potentially anchor I will use observable data on other, similar places which have a fixed pricing strategy. The pieces of data to be collected are: price of menus, fixed prices for catering whether it is self service or not.⁵ The self service restaurants are similar in style to DWD and observations show that the average price paid for a full menu is between 6 and 8 Euros.

3 Theories and Hypothesis

In this section I identify the motivations of the owner to apply a pay-as-you-wish pricing scheme, then I describe the relevant communication groups in the restaurant and derive hypothesis that are to be tested in the next section. The decision of the owner to adapt the pay-as-you-wish pricing strategy

⁴It was made clear that all of this money goes to the restaurant and not the experimenters

⁵I have so far identified following similar places within 1 km from DWD.

1. Self Service Restaurants: AI Mensa, KHG, Mensa im NIG
2. Indian Restaurants: Indisches Restaurant Heilige Kuh, Oasia, Jaipur Palace, Safran, Taj Mahal, Restaurant Samrat, Sahiba, Curry Insel (all you can eat)

was based on experimentation. When DWD opened in June 2005, they introduced the pricing strategy under investigation as a mean to attract costumers in the first few weeks (that this is an optimal strategy even if costumers have standard preferences can be seen in BURDETT COLES...) . As this strategy lead to positive contributions that were about the same as they would have applied for a fixed pricing strategy and had a positive marketing effect in attracting costumers, the owner decided to keep it. In this stage the expectations of the owner have been formed.

3.1 Communication

Face-to-face communication on generosity or “altruism” have been studied in various contexts starting from early literature in social psychology and experimental economics. Many authors ⁶ have shown that relevant (strategy-related) communication has an influence on decisions. Bargaining [Radner and Schotter, 1989], social dilemmas and public good games [Orbell, 1988] coordination games

The controversy was whether communication only helps if it is relevant or even if it is irrelevant in a sense that it is not related to the game. Roth [1995] examined the influence on face-to-face “social” communication, where they were not allowed to talk about the bargaining game but learned their opponents name and first year in school in a 2-min preplay conversation. He found that this from a theoretical point of view irrelevant information leads to the same amount of cooperation (agreement) as relevant communication in bargaining games. While Dawes et al. [1977] studied the influence of strategy irrelevant communication (10-min discussion about income distributions in Eugene, Oregon) and found no increase in the cooperation rates compared to a no communication treatment. Buchan et al. [2006] make the point that personal information - like in the case of Roth - matters, while fact based non game related information plays no role in the formation of behavior.

The groups of communication relevant for the individual contribution formation are the peer group at the table, the owner/representative and the experimenter. As I try to elicit motivations to give it is hard to decide a priori what is strategy relevant communication and what not. In my experiment strategy related talk can include the transfer of information of the owners expectations on payment to the costumer (for guilt aversion) or the owners intentions to run this restaurant (for theories on intention based reciprocity, if the restaurant owner speculates on the guilt aversion motive to maximize profits, consumers will be less likely to contribute then when the motive of the owner is - as stated in advertisements - providing “Essen für alle”). Furthermore communication will only be relevant if costumers have no perfect information on these expectations from other sources (like for example a fixed social norm resulting from frequent visits of the restaurant). In the purely selfish model as well as in the warm glow model, communication should have no influence.

I focus on the communication with the owner first: The owner sends a signal to the costumer, that might convey information on her expectation (i.e. private information) of the costumer’s contribution although we can control for the words we can not control for other languages used to induce people to pay: body language and facial expressions are out of our control. To minimize learning about expectations, in the experimental design, the participants will always be approached with the neutral phrase

⁶This part follows Buchan et al. [2006].

“Zero plus”, which only conveys expectations of positive payments, which should have no additional information than what people already know⁷. Another aspect of communication with the owner is out of our control, because we are only allowed to make friendly statements to costumers. Therefore we can not be sure whether reciprocal behavior to “friendly” behavior plays a role in the communication treatments 1 and 3. The other problem with the possibility of the use of friendly expressions, be it facial or verbal, is its implicit information content. Being friendly could mean that the owner is interested in at least a strictly positive amount to be paid, which is informative for the agent who is driven by guilt aversion. In the second treatment, we reduce communication with the owner to a minimum, so reciprocity on friendly behavior will not be possible. This therefore opens a way of disentangling reciprocity on “service”, or friendliness at the counter, and food quality.

Communication within the peer group is more difficult to describe. Guilt averse individuals who are not perfectly informed about the owners expectation can use the peers to update their believes. While people who are driven by esteem or shame towards their peers can use communication to gather information on what appropriate behavior is. This aspects we can not control for and therefore will not consider it explicitly in the empirical analysis. An other aspect of communication that also can be studied in this situation is the influence of the experimenter on outcomes. As we were present in the restaurant and visible to all costumers we might have effected payment behavior independent from treatments.

3.2 Hypothesis on Voluntary Contributions

Two aspects of the restaurant: it’s existence, which can be considered as a public good, and the food they sell. This distinction is relevant for arguments concerning repeated games and pure altruism.

Standard repeated games arguments can not give a satisfactory explanation of the observed payment behavior, as no costumer is pivotal to the existence of the restaurant and so a person who contributes nothing will be able to go there given that the others pay⁸. Therefore it seems reasonable to assume that people have other regarding preferences or are “egoistic altruists” in the sense that they experience pleasure by doing good things to other people or they take into account expectations and utility of others without a component of selfishness. Pure altruism is willingness to act in consideration of another person. The arguments why pure altruism can not explain the observed behavior go in the same direction as the repeated goods argument. Altruism can be directed in two directions towards other costumers, by taking the public goods aspect of this restaurant The most unspecific form of social preferences is the warm glow hypothesis (see [Andreoni, 1989](#) and [Andreoni, 1990](#)) An economic agent derives utility from giving, which gives her pleasure, independent from the valuation she puts on the good. Giving is assumed to be a normal good and therefore is increasing in income:

Hypothesis 1 *The contribution of an individual depends positively on income or a proxy thereof (possibly non-linear). Communication should not influence payment behavior*

⁷This is in contrast to [Charness and Dufwenberg \[2006\]](#) who allow for informative statements

⁸This is similar to voting in very large groups, participation there uses behavioral arguments for participation (see [Grossamm and Helpman](#))

Guilt aversion is a form how believes over believes of a persons behavior shape influence her utility. Not letting other people down or meeting other peoples expectations are powerful sources of motivation.⁹ In my example the appropriate belief is the owner’s over people’s payments. If the consumer does not act according to those beliefs, she feels guilty which has a negative effect on her utility. In a very recent study, [Charness and Dufwenberg \[2006\]](#) give experimental evidence on simple investment model with and without communication. The difficulty is to distinguish guilt aversion from reciprocity. I will assume that the owners expectation does not depend on the costumers perceived quality of the food.

The main concern in this case is to correctly measure people’s second order beliefs over the beliefs of the owner. While [Charness and Dufwenberg \[2006\]](#) ask for peoples second order beliefs in their controlled experimental setup, after the decisions have been made and rewarded good guesses. In my setup a reward for good guesses can not be paid, so I have to rely on peoples answers without incentivicing them to give appropriate ones.

Hypothesis 2 *Costumers whose motivation of contribution is guilt will pay what they think that they are expected to by the owner, no matter if they are observed or not.*

Esteem or shame towards peers and/or the owner can be another driving factor for positive contributions.¹⁰ The connection of guilt and shame is described by [Kandel and Lazear \[1992\]](#) in the, while guilt has internal motivations, people who experience shame do so only if they are observed when acting “not appropriately”. Shame or esteem towards the owner we can distinguish from guilt by the no communication treatments. However, as we can not observe the communication process at the table the best to hope for to test is whether costumers behave like the average of the rest of the group they came with¹¹.

Hypothesis 3 *An individual that is driven by esteem or shame towards the owner and not the peers will contribute*

1. *What they think that they are expected to by the owner*
2. *Nothing if she is not observed by the owner, no matter whether she is observed by her peers*

A more directed motivation is direct reciprocity.¹² In the present context, the restaurant owner provides a gift to the costumer, where the intentions are obviously “honorable”. The costumer accepts this gift she feels obliged to reciprocate in donating money when leaving. Differences to traditional gift giving

⁹Game theory offers a framework to analyze this type of motivation: Psychological games in the sense of [Geanakoplos et al. \[1989\]](#) are flexible to make believes about other peoples behavior directly payoff relevant.

¹⁰For a model that incorporates a desire of conformity into the utility function [Bernheim \[see 1994\]](#) or for an extended version [Benabou and Tirole \[2006\]](#)

¹¹In the end of the paper I will discuss attempts to test the hypothesis of shame versus peers. The control group against which to test communication towards peers are costumers who sit alone at the table. The caveat is that this control group is not a random sample of the population.

¹²Theories of reciprocity, [Falk and Fischbacher \[2001\]](#), describe reciprocity as an act not responding not solemnly to another act, but also to intentions, that lead to this act. There is also a difference between purely intention driven models [[Dufwenberg and Kirchsteiger, 2004](#)] and fairness driven models [[Fehr and Schmidt, 1999](#)].

situations are (a) that the donor does not discriminate among recipients of the gift so everybody can be a recipient (one sided reciprocity) (b) that the beneficiary can choose - within a range - the size of the gift. Taking the gift the costumer feels an obligation to reciprocate and therefore pays a positive amount to the gift donor. The problem here is to what the consumer reciprocates. I will take the position that the level of reciprocity depends on the size and the quality of the gift. The main desire of people here is to reward [see [Fehr, Ernst and Gächter, Simon, 2000](#)], rather than distributional or fairness concern. To elicit the presence of reciprocal attitudes I use a question on quality and quantity of the food consumed and a question on how their payment would change when the quality would be one category lower than indicated.

Hypothesis 4 *Costumers, motivated by reciprocity on the quality of food will increase their contribution by their reported quality.*

3.3 Social Information and Reference Points

Social influence research shows that people rely on social information to infer appropriate behavior in ambiguous situations. When social information is no longer relevant or informative (such that previous information i.e. a social norm dominates the updating to an additional piece of information) then it loses its suggestive power. [Cason and Mui \[1998\]](#) show that outlying social information does not influence decisions compared to treatments with no social information.

To evaluate the role of social information in this context I provide information on average payments conditional on consumed food (vegetable curries, meat curries, mixed) and make it common knowledge at the table under investigation. When costumers are anchoring on this information, I should see effects on their payment behavior. The degree of knowledge over information seems to matter for its effectiveness [Chaudhuri et al. \[2006\]](#) found that private or public advice does not effect decisions in a public good game, while common knowledge of advice significantly alters behavior of the experimental subjects.

Hypothesis 5 *If costumers are concerned about appropriate behavior then social information is important to them. The effect of social information is higher on individuals who come for the first time and/or are alone at a table.*

3.4 Methodology

This section follows [Manski \[1993\]](#) and Bandiera and Rasul (200?). Due to the fact that communication can not be completely excluded at the table, the identification of peer effects becomes more difficult. Denote the payment of individual i as p_i and $n(i)$ be the group she belongs to. The payment of individual i depends on her own characteristics X_i the payment vector $p_{n(i)}$ of the persons within her group and the characteristics of the group $X_{n(i)}$

$$p_i = \delta_1 X_i + \gamma p_{n(i)} + \delta_2 X_{n(i)} + u_i$$

According to Manski [1993], γ measures the endogenous social effects i.e the direct effect of the behavior of the others on and δ measures the exogenous social effects. In this study, if people are concerned about not deviating t....

The problems that arise in estimating these effects can be departed in two problems: correlated unobservables and simultaneity. If we assume that all people in a group are influenced by each other then $p_{n(i)}$ is a function of p_i as well. This is what is commonly known as the reflection problem. Assuming that the error terms are uncorrelated between the group members, the parameters can be consistently estimated using a system of equations. For consistency, however, we need the assumption on uncorrelated error terms also means that we do not have the problem of correlated unobservables.

The problem of unobservables can not be solved immediately: the first type of unobservables is group specific, in our context this might be the, the second type is individual specific and has to do with endogenous group formation. In our context, if people are that have a certain type of generosity decide to go to gether to the restaurant, this type can not

The data requirements to estimate social effects in the Manski framework are (i) a complete set of personal characteristics that determine payments (ii) the behavior of the *true* social group (iii) and the relevant characteristics of the social group.

The advantage in this case compared to other studies on social effects it, that we have a clearly specified group that is relevant for the actions.

I run OLS regressions of the following type, with different interaction terms. *expect* represents the second order expectations of costumers on the expectations of the owner. *treat* are treatment dummies for treatments two to four. *age* serves as a proxy of income that I expect to have a non linear influence on payment. *alone* is a dummy for sitting alone at a table and *uobs* is a dummy whether the person received the anonymous payment info. $X_{n(i)}$ are group controls (like group size, average payment of other people in the group) and X_i are other individual characteristics and controls that might influence payment behavior (gender, occupation class, previous visits to the restaurant, estimated production costs).

$$p_i = \alpha_1 + A \text{treat} + \beta_1 \text{exp}_i + B \text{exp}_i \times \text{treat} +$$

$$\gamma f(p_{n(i)}) + \Gamma \left(\begin{matrix} \text{age} \\ \text{age} \end{matrix} \right) + \mu_1 \text{alone}_i + \mu_2 \text{alone}_i \times \text{uobs}_i + \Delta_1 X_i + \Delta_2 X_{n(i)} + u_i$$

The influence of others on social behavior can take different shapes, therefore I use different specifications of $f(\cdot)$ as explanatory. What a lot of previous studies on social effects do is to take the average action of the group $f_{\text{average}}(p_{n(i)}) = \sum_{j \in n(i)} \frac{p_j}{\#[n(i)]}$, where $\#[Z]$ is the number of elements is set Z . Total giving of the rest might also be interesting $f_{\text{total}}(p_{n(i)}) = \sum_{j \in n(i)} p_j$. Another way is not to assume a functional form of $f(\cdot)$ but to estimate it. Another possibility is, that not all individuals are equally influential on the table, therefore f can take the form of a weighted average. An extreme form would be where the weights of people who already have been eating there is equal to one and the

others is equal to zero. Let therefor A be the set of individuals who have already visited the restaurant

$$f_{first}(p_{n(i)}) = \sum_{j \in n(i) \cap A} \frac{p_j}{\#[(n(i) \cap A)]}$$

Hypothesis 1, the hypothesis on pure warm glow, requires that all coefficients in equation ?? are not significantly different from zero except for Γ_1 that is suspected to be positive. Guilt requires the coefficient on the expectation B_1 to be positive and costumers should not alter their behavior whether they are observed or not by the owner. Shame towards the owner requires that my reference group of observed individuals pays more than the people who pay unobserved.

The sign pattern for shame towards peers can be the same than for guilt and shame towards the owner. For identification in this case I have to rely on people who sat alone as a reference group, which is - however - not a random sample of the population and my treatments remain silent.

Table 1: Identification

	β_1	β_2	β_3	β_4	Γ_1	μ_1	μ_2
Warm Glow	0	0	0	0	+	0	0
Guilt	+	0	0	0	0	0	0
Shame towards the owner	+	-	0	-	0	0	?
Shame towards peers	?	?	?	?	0	-	?

3.5 Some issues of selection and external validity

External validity is an issue in every experiment. It is important to know to which group of people it can be applied and how I can deduct general statements from the results of an experiment. Previous work on experiments have similar problems: typical laboratory experiments are done with students, field experiments, like the one conducted by ? used selected subgroups (previous donors) of the population. In our case we have the problem, that they only sell Indian/Pakistani food, so people who do not like this type of food will never choose it. Furthermore it is not a high class restaurant, so more students will go there as well. We can do better in this experiment, as we have personal characteristics of people, that we control for.

Another interesting point is who deselects from the restaurant. Anecdotal evidence (of at least 4 people) gives the following puzzle: those people decided not not return to this restaurant because they want to avoid the situation of making up their own price. One person told that she paid more than she would have been willing to pay at a similar place. This can be interpreted as overcompensation in the sense of [Benabou and Tirole \[2006\]](#). In experiments [see [Lazear et al., 2006](#)], it was shown, that subjects avoid dictator games and are even willing to pay a premium to avoid them.

Another concern is the effect of the experimenter. As people are well aware of being experimental subjects, there might be a possibility that subjects want to “pleases” the experimenter.

Table 2: Occupation by Costumer and Average Payment

Goldthorpe social class students enhanced	Mean	Sd	Mean
	payment	payment	age
Missing or wild (0%)			21.00
Service class, higher (9%)	6.10	1.79	34.61
Service class, lower (15%)	5.94	1.98	33.68
Routine non-manual (4%)	6.13	2.29	33.75
Personal service (4%)	5.59	1.70	31.42
Forman, technicians (1%)	5.17	0.76	34.33
Skilled manual worker (0%)	3.75	1.77	23.00
Students (62%)	4.72	1.40	23.42
Unemployed (1%)	5.75	2.22	45.75
Total (100%)	5.17	1.71	27.33

4 Results

4.1 Data and measurement

We observed a total of 258 costumers between the June 1 to 9 2007 except Sun 3 and Thu 7 where the restaurant stayed closed. Most of them were students (62%) followed by people working in the service sector. Very few manual workers attend the restaurant, as it is located in an office area. Figure ?? shows the distribution of occupational classes after Goldthorpe (enhanced by the categories *student* and *unemployed*). The number of different groups we observe is 126, where a group is defined via table numbers and time. All people that sat together at a table are considered as a group and therefore help to identify the relevant environment of interaction. The mean group size is 2.54 and the maximum number of people interviewed at a table was 8. We interviewed slightly more female persons than male. The majority of people (53.7%) plans to attend the restaurant again within the next month. 11 summarizes the composition of costumers by treatment and demographic characteristics. In order to whether randomization did work we compare the distribution of individual characteristics by treatment.

Average payment per weekday does not show a consistent pattern. While people pay most on average over all treatments on Monday and Saturday the contribution was lowest in the middle of the week. This observation is consistent if one looks at the contributions for each treatment separately. The observed higher payments on Saturday are in line with the observation of recorded data (see Riener 2008).

Table 3: Average payment per treatment and day of the week

Treatment	Day of the week					Total Mean
	Monday Mean	Tuesday Mean	Wednesday Mean	Friday Mean	Saturday Mean	
full comm.	5.08	5.31	3.83	4.01	5.00	4.66
limit. comm.	6.54	5.19	4.45	5.75	4.92	5.37
full comm. SI	5.94	5.25	4.85	5.34	5.52	5.44
limit comm. SI	4.72	5.47	3.63	5.44	5.89	5.20
Total	5.51	5.30	4.28	5.09	5.47	5.16

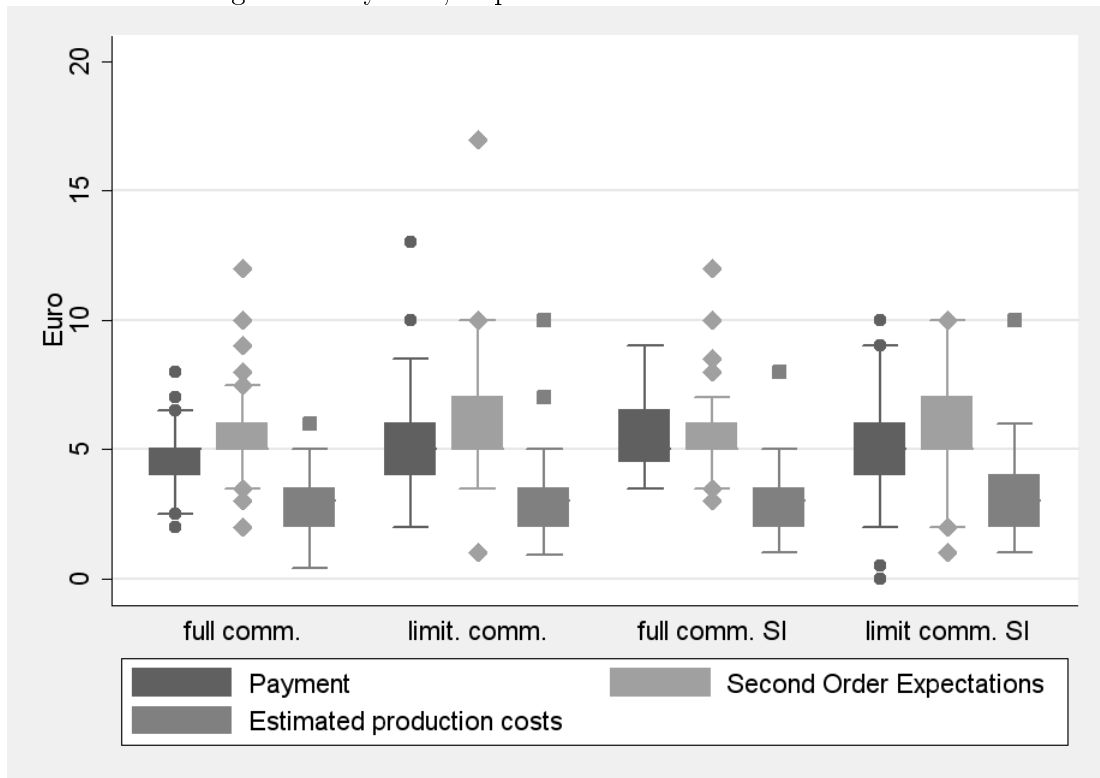
The customer composition also varies according to the floors of the restaurant. In the basement (0), people significantly younger than in the ground floor (2). (For a map of DWD see [A.3](#)). Furthermore the payments differ from 4.67 in the basement to 5.59 in the ground floor.

Table 4: Average payment by treatment and floor

Floor	Mean payment	Sd payment	Mean age
Ground Floor	5.59	1.7	28.9
Mezzanine	5.09	1.8	27.4
Basement	4.67	1.3	25.9
Total	5.16	1.7	27.5
N	257		

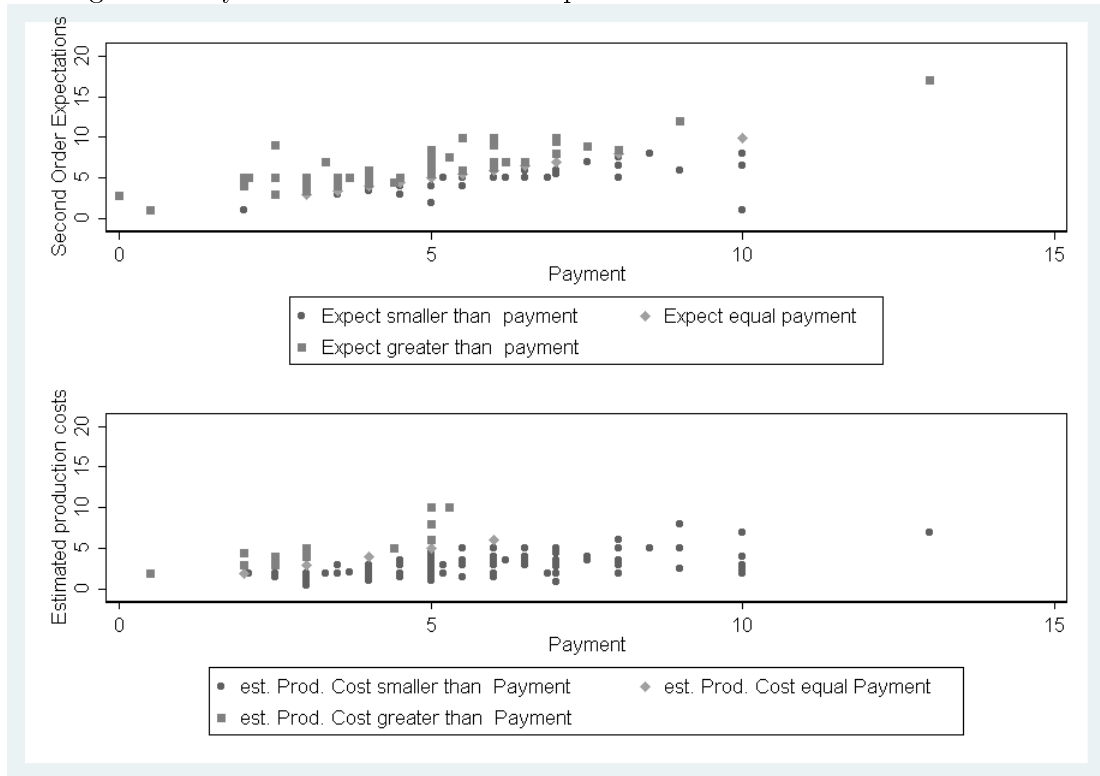
The average payments per treatment are reported in table 3 and visualized in figure 2. The only treatments that are significantly different in distribution of payments are treatments 1 and 3. Examining figure 2 one can observe that the answers on the production costs and the expected payment do not vary much over treatments, which indicates that people answered the questionnaire independently from the treatment. The actual payments show greater sensitivity to treatments.

Figure 2: Payment, Expectations and Production Costs



The relationship between the actual payments, expectations over payments and estimated production costs. While most people paid less than their second order expectation over payment, there is a strong positive correlation between those variables. In figure 3 the payment and estimated production costs are plotted. The dots signify people who paid less than the estimated production costs. Only very few people pay below these estimations and even these are positively correlated with the payment indicating that individuals see production costs as a lower bound for their payment behavior. However the correlation between production costs and payments is less pronounced than the one between expectations and payments. This speaks against people just putting a markup on production costs as a reference point.

Figure 3: Payment vs Second Order Expectations and Est. Production Costs



Another interesting comparison of the second order beliefs and average production costs. While most of the costumers had higher second order beliefs than estimated production costs, nine of them though that they are expected to pay less than they think the production costs are.

The quality measurement is subjective, all the concerns expressed in [Bertrand and Mullainathan \[2001\]](#). In order, however there average payments per quality level are monotonically increasing from 4.00 € for quality level 1 to 5.60 € for quality level 5. A test of equality of mean payments of quality 2 and 5 suggests to accept the hypothesis that the average payment for quality 5 is larger than for quality 1 at the 1% level.¹³

4.2 Discussion of Hypothesis

Table report the econometric models without controlling for group characteristics. The most robust result are the second order expectations over the owners expectations, estimated productions costs, age, whether the individual is reportedly reciprocal or not on payment. The age effect disappears as soon as we introduce occupational dummies. Treatment dummies are not very robust to specifications of the model. The most striking result is here that treatment 1 is in all specifications the one where people pay the least of all treatments, which is not entirely clear, as one would expect, if people show a reaction to treatments, that it would go in the other direction: that people in treatments 2 and 4, where they are only observed by their peers pay less.

In the light of my hypothesis outlined above a general feeling of warm glow for giving can not be ruled out as age or ranked occupation classes show up with a positive coefficient, so more affluent individuals

¹³For a detailed table with test results see table 13 in the appendix

tend to give more. Guilt seems to be present as well as all coefficient on the treatments are positive and not significantly different from each other. The coefficient on the average of other peoples payments on the table is positive, this can have two reasons, as discussed in the section on methodology: First we can have unobserved correlations in factors that determine payments and second we have effects of shame towards peers or a demand for conformity.

Shame against peers can be observed for people who sat alone in a table and paid in an envelope. The coefficient on this dummy is -0.66 while the coefficient on the interactionterm when they are observed is 0.33 . The sum of these two coefficients is not significantly different from 0.

The most robust estimation is for second order expectations over the owner expectations what to pay. The coefficient of estimation is around 0.39 and is robust against introducing estimated production costs as an explanatory variable. Age enters significantly positive with coefficient of 0.20 into the regression as long as occupation classes are not introduced as shown in column (6).

The other interesting and very robust variable is the dummy for reportedly reciprocal individuals: people who belong to this group pay around 0.80 € more than people, who say that they would not change their payment behavior. The reaction of the two groups to their second order expectations is not different from each other. A possible explanation is that subjects who report being reciprocal on food quality are reciprocal in a more general way, for example towards the owner offering the service. This might increase their contribution on top of other motivation like guilt aversion or warm glow. However, it is not possible in this framework to test this hypothesis.

One question [Falk \[2007\]](#) asks in the conclusion is whether a gift exchange relationship can be re-initiated or surprise plays a major role, I would answer in the affirmative in the present context of gift exchange with private good. This can be seen in equation (4) where control for restaurant visits in the past month which has no effect on the giving behavior, so it seems that gift exchange can be reinitialized within this context.

It is hard to reject the general warm glow hypothesis as age and occupation class as a proxy for income have robust and positive coefficients.

One important factor that influences the behavior of an individual are the characteristics and behavior of the group she is with. Models (5), (6) and (7) tackle this issue. In the following I introduce following group specific variables to the previous regressions: average payments of other group members (losing observations, because people who came alone are not in this sample), group fixed effects and group size.

Controlling for group-size one sees a clear effect, from people who sit alone at the table to group-size two: here I would argue, that the peer pressure and communication is highest, one can be easily and directly observed, while monitoring everybody gets increasingly difficult with group-size. However, for the group of 8 people there is only one observation therefore this effect, although statistically significant, has to be seen with caution. The parameter for expectations is fairly robust against the introduction of group controls and has a value around 0.4 in the regressions including group-size and drops to around 0.3 when introducing average payments of others at the table.

The following tables shows the results when I introduce the average payments of other people on

Table 5: OLS Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Payment	Payment	Payment	Payment	Payment	Payment	Payment
Treatment 2	0.36 (1.49)	0.089 (0.39)	-1.12 (-1.42)	2.11* (2.03)	-0.59 (-0.71)	-0.85 (-1.15)	2.77 (1.43)
Treatment 3	0.60* (2.32)	0.38 (1.54)	-1.21 (-1.19)	-0.19 (-0.15)	-0.56 (-0.55)	-1.09 (-1.16)	3.38* (2.19)
Treatment 4	0.27 (1.06)	0.19 (0.82)	-1.34 (-1.56)	0.100 (0.10)	-0.98 (-1.11)	-1.03 (-1.25)	2.51 (1.85)
Second Order Expectations	0.59*** (11.54)	0.52*** (10.68)	0.17 (1.49)	0.43** (2.91)	0.26* (2.06)	0.14 (1.36)	0.36*** (4.84)
Age		0.23*** (4.24)	0.21** (3.09)	0.10 (1.24)	0.19** (2.76)	0.092 (1.29)	-0.0077 (-0.06)
Age squared		-0.0025*** (-3.37)	-0.0022* (-2.24)	-0.00087 (-0.74)	-0.0019 (-1.91)	-0.00069 (-0.69)	0.00069 (0.42)
_ItrreXexpec_2			0.24 (1.76)	-0.31 (-1.65)	0.15 (1.04)	0.21 (1.65)	
_ItrreXexpec_3			0.30 (1.68)	0.094 (0.38)	0.19 (1.00)	0.24 (1.47)	
_ItrreXexpec_4			0.32* (2.15)	0.046 (0.25)	0.25 (1.61)	0.25 (1.79)	
Estimated production costs			0.18* (2.57)	0.23** (2.79)	0.16* (2.28)	0.14* (2.14)	0.044 (0.55)
comeagain=1			0.55* (2.16)	0.95* (2.50)	0.39 (1.52)	0.33 (1.31)	0.034 (0.08)
comeagain=9			0.18 (0.68)	0.69 (1.62)	0.042 (0.15)	0.032 (0.12)	-0.023 (-0.05)
Reportedly reciprocal			0.76*** (4.11)	0.90*** (4.25)	0.71*** (3.85)	0.73*** (3.96)	0.77** (3.35)
Evening			0.34 (1.89)	-0.11 (-0.51)			
_Iobserved_1			0	0			
Alone at table			-0.66* (-2.08)				
_IobsXalone_1			0.33 (0.60)				
Visited in the last month			0.0035 (0.07)				
First visit					0.43* (2.03)	0.17 (0.84)	0.25 (0.86)
_Iegroupsiz_2					0.54* (2.18)		
_Iegroupsiz_3					0.45 (1.57)		
_Iegroupsiz_4					0.21 (0.56)		
_Iegroupsiz_5					-0.027 (-0.05)		
_Iegroupsiz_8					-1.13 (-1.61)		
Average payment of others						0.36*** (6.11)	
_cons	1.59*** (5.02)	-2.21* (-2.48)	-1.61 (-1.28)	-1.59 (-1.12)	-1.81 (-1.42)	-0.71 (-0.57)	-0.43 (-0.18)
_Igroup*	No	No	No	No	No	No	Yes
Observations	227	227	198	131	198	169	198
Adjusted R ²	0.386	0.465	0.532	0.466	0.547	0.630	0.687

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

the table. This variable is a summary statistic for characteristics of the group and the parameter is clearly positive however not significantly different from the parameter on the second order expectations. However there is an endogeneity problem as well as a problem of unobservables of characteristics of the group to infer any causal relationship. In the appendix I report other specifications of group behavior, as described in the section on methodology and report an instrumental variables regression where the average payments of others are instrumented by the average expected production costs.

Even if I include group dummies, which reduces the degrees of freedom dramatically, second order expectations, the reciprocal group stay significant. In addition the coefficient of treatment dummy 3 in the expected direction, namely that costumers react stronger to social information when they are observed by the owner.

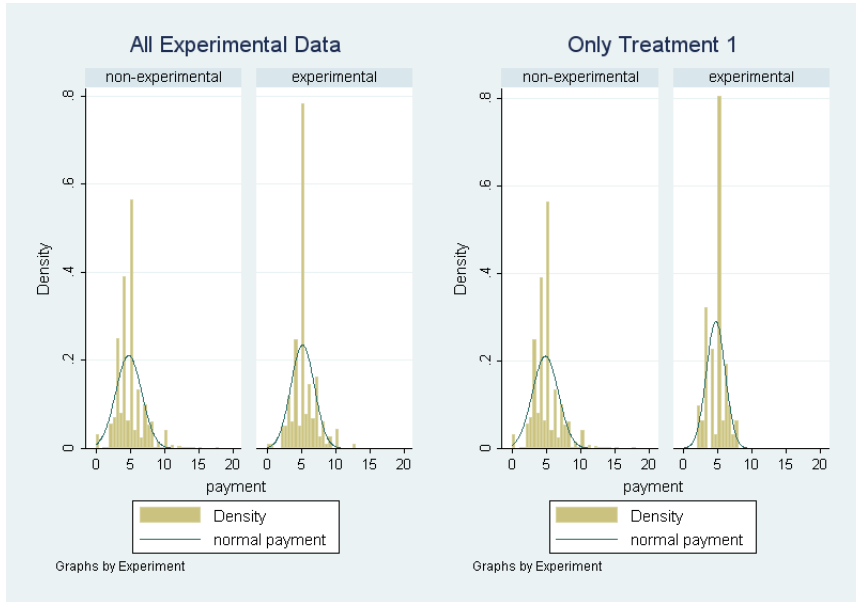
If people are motivated by shame against their peers people should pay less when they come alone and even less when they come alone and pay in an envelope. The coefficient of sitting alone at the table is -0.66 and significantly different from 0. If they are observed at the counter by this action the coefficient is 0.33 , not significantly different from 0. As the treatments are randomly assigned over people sitting alone at the table as well, I interpret this effect as shame towards the owner. However, none of the people who sat alone and was not observed paid less than 2 Euros and had a maximum payment of 8 Euros, so internal forces like guilt help in not only taking money out of the envelope but contributing a positive amount.

4.3 Some further results

The experimenter effect

This data-set allows me to look at this effect in several different ways: Taking the observations of (a) all treatments or (b) only treatment one, the baseline treatment, that only distinguishes itself from day to day business by costumers filling out the questionnaire and comparing them to (i) people who have not received any treatment during the week of the experiment (however these people are aware of the experiment) and (ii) to people in the previous and the following weeks. The data on the week of the experiment are not yet available, therefore I only show combination (a,ii) and (b,ii). Histograms in figure 4.3 illustrates that the payments are far higher concentrated around 5 € within the experimental data. However a Kolmogorov-Smirnov test on the equality of distributions for treatment 1 in the experiment and the month of May 2007 results in a D-value of 0.1020, therefore I accept the null Hypothesis of equality of the two distributions on a 5% level.¹⁴

¹⁴A Kolmogorov-Smirnov test comparing the whole sample of the experiment with the recorded data of May gives a D-value of 0.1869 and therefore leads to rejection of the null hypothesis. However, this comparison is not suitable for evaluating an experimenter effect as the treatments are designed to distort usual payment behavior.



Reciprocity

In order to get a direct measure of intentional reciprocity, the following question was used: “How much would you pay if the quality would be one category lower than you indicated?”. I call people who would pay less than they actually paid as *reportedly reciprocal* on quality. This can be interpreted as a measure of a more general type of reciprocal personality. Table ?? represents the proportions of reportedly reciprocal individuals per treatment. A first question to answer is whether reportedly reciprocal people differ in their perception of quality. The average reported quality of this group is 4.08, compared to 4.18 for the others. These values are not statistically different from each other on a 5% level.

Table 6: Characteristics of reportedly reciprocal individuals

Reportedly reciprocal	Mean				Sd
	payment	male	quality	age	
No	4.4	0.4	4.2	25.7	7.0
Yes	5.6	0.5	4.1	27.6	7.4
Total	5.2	0.5	4.1	27.0	7.3

How comparable are individuals according to their reported reciprocity and the average reciprocity in the population? To answer this question I construct the differences between the average payments conditional on reported quality and compare them with the average reported measure on reciprocity. As a lot of people stated that, if the quality would be lower they would not come anymore, we should see the differences of the actual payments as a lower bound for the difference. The last column shows the average reported reciprocal behavior excluding those individuals who would not go to the restaurant anymore. The average statement of the degree of reciprocity is much higher than the actual difference in quality payment. While this can be due to heterogeneity of people across quality levels, the magnitude of this effect indicates that people are overstating their willingness to reciprocate.

Table 7: Summary of Reciprocity by Quality

Quality	Mean		
	payment	diffpay qual	degree reciprocity
1	4.00		2.00
2	4.20	0.20	0.06
3	4.45	0.00	1.24
4	5.13	0.00	1.25
5	5.60	0.00	0.82
Total	5.16	0.01	1.07

Table 8: Average payment by gender and treatment

Gender	Treatment				Total
	full comm. Mean payment	limit. comm. Mean payment	full comm. SI Mean payment	limit comm. SI Mean payment	
Female	4.67	5.11	5.15	5.07	5.00
Male	4.65	5.74	5.71	5.40	5.36
Total	4.66	5.37	5.44	5.20	5.16

The role of gender

The role of age and gender has been explored in several studies. [Eckel, Catherine C. and Grossman, Philip J. \[1998\]](#) found in a double-anonymous dictator experiment that women donate twice as much as men. [List \[2004\]](#) finds a connection of age and other regarding behavior in three different field situations. In my study male costumers paid on average 5.36 Euro and female costumers 5 Euro, these differences are not statistically different from each other as one can see in table 8. Furthermore men and women react similarly to the treatments applied. It is common to assume that male are more driven by esteem then women, especially in an environment where women are present, so I look at the following composition at the table: two people at the table where one was male and the other female. The male person paid on average 5.43 Euro and the female paid 5.45 Euro, these values are as well not significantly different from each other on a 5% level and do not vary significantly over treatments.

The effectiveness of Social Information

From the pilot study in February 2007, I obtained data costumer payments and could condition on their consumption, either only vegetarian curries, only meat curries or both. While costumers who only consumed vegetable curries paid 5.40 Euros, costumers who only had meat curries paid 6.00 Euros and those who consumed both paid 6.30 Euros, these payments are significantly larger than the normal average payments. I gave this information to costumers in treatments 3 and 4. Social information might change peoples second order expectations and therefore are effective for people who are guilt or shame averse. Column (2) and (3) in table 9 show the effect of this information expectations. This indicates that if social information has no significant positive influence on the formation of expectations. There

is no significant effect neither on first time comers nor on people who have visited the place already. So these treatments did not show the expected effect.

Table 9: Social Information

	(1) Payment	(2) Second Order Expectations	(3) Second Order Expectations
socinf=1	0.14 (0.71)	0.13 (0.60)	0.14 (0.59)
firsttime=1	-0.060 (-0.22)		0.55 (1.56)
_IsocXfir_1_1	0.74 (1.85)		-0.044 (-0.08)
Second Order Expectations	0.40*** (7.09)		
Estimated production costs	0.17* (2.48)	0.55*** (7.08)	0.52*** (6.50)
comeagain=1	0.43 (1.71)		
comeagain=9	0.13 (0.47)		
Reportedly reciprocal	0.81*** (4.44)	0.10 (0.43)	0.11 (0.48)
Age	0.22*** (3.37)	0.21* (2.58)	0.20* (2.32)
Age squared	-0.0023* (-2.46)	-0.0024 (-1.95)	-0.0021 (-1.71)
commprice=1	0.12 (0.64)		-0.089 (-0.40)
_cons	-2.74* (-2.47)	-0.13 (-0.10)	0.18 (0.13)
Observations	198	198	198
Adjusted R^2	0.529	0.259	0.263

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Instrumental Variable Approach (STILL DEBATABLE!!)

One approach to tackle the endogeneity problem, resulting from correlated unobservables is the use of instruments. One instrument for the average payment of others at the table that I suggest is the following: average estimated production costs. This instrument should not be correlated with unobservables like a general attitude towards generosity, but is clearly correlated with the average payment of others. Table 10 reports the coefficients of the baseline regression and compares it when average payment of others is instrumented with average estimated production costs. The estimators do not change substantially.

Table 10: IV Regression and Comparison

	(1)		(2)	
	Baseline		IV	
Treatment 2	0.26	(1.09)	0.28	(1.09)
Treatment 3	0.22	(0.92)	0.24	(0.94)
Treatment 4	0.36	(1.58)	0.38	(1.56)
Second Order Expectations	0.31***	(5.76)	0.32***	(5.49)
Estimated production costs	0.14*	(2.19)	0.14*	(2.18)
First visit	0.17	(0.82)	0.17	(0.83)
comeagain=1	0.33	(1.33)	0.35	(1.33)
comeagain=9	0.092	(0.35)	0.11	(0.40)
Reportedly reciprocal	0.73***	(4.01)	0.74***	(3.87)
Age	0.086	(1.24)	0.098	(1.12)
Age squared	-0.00056	(-0.58)	-0.00071	(-0.61)
Average payment of others	0.37***	(6.24)	0.33*	(2.04)
_cons	-1.64	(-1.48)	-1.74	(-1.45)
Observations	169		169	
Adjusted R^2	0.628		0.627	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 4: Questionnaire: English Translation

1. What of the following have you consumed today?
- | | | |
|---------------------------|------------------------------|-----------------------------|
| Starter? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Meat curry (one or more)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Vegetable Curry? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Dessert? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| Drinks (except water)? | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
2. On a scale from 1-5 (where 1 is very bad and 5 is excellent), how would you judge the quality of food you had today? Please tick.
- 1 2 3 4 5
3. I am here for the first time Yes (jump next question) No
4. How often have you been at the Wiener Deewan?
- | | | |
|------------|-------|-------|
| Last week | _____ | times |
| Last month | _____ | times |
5. Have you been to the cinema last week? Yes No
6. How often do you eat out per week on average (including lunch)? _____ times
7. What do you think the owner expects you to pay for today's consumption? _____ €
8. Which other Curry and/or selfservice restaurants have you visited in the last month? Could you please name one or more and how much you paid per person (including beverages).
- _____ € _____ €
9. Please give an estimate of the average production costs for the meal you consumed today? _____ €
10. Sex female male
11. Place of birth _____ 12. Year of birth _____
13. Occupation _____
14. Do you intend to visit the Wiener Deewan within the next month?
- Yes No Not sure yet
15. Did you know the pricing strategy of the Wiener Deewan before you consumed today?
- Yes No
16. Have you talked about the pricing strategy on the table?
- Yes No

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A Appendix

A.1 Questionnaire

A.2 More Detailed Descriptive Statistics

Customer Composition

Table 11: Customer composition

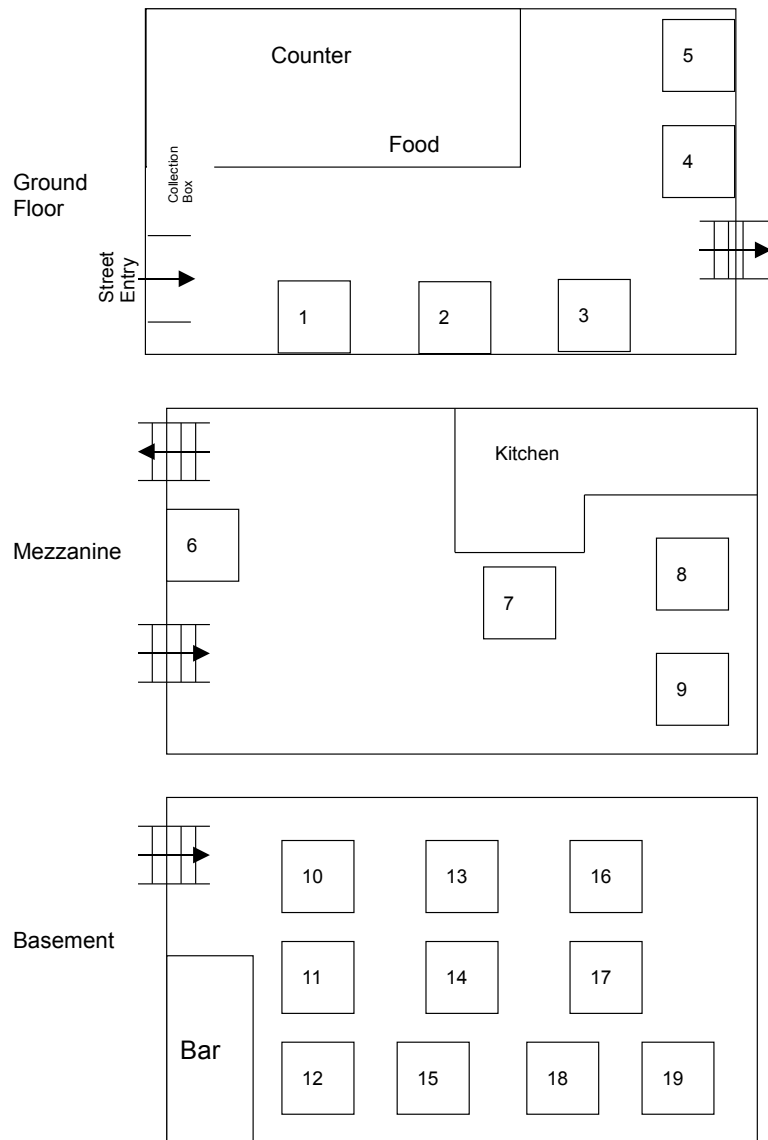
	Treatment								Total	
	full comm.		limit. comm.		full comm. SI		limit comm. SI			
	%	%	%	%	%	%	%	%	%	%
Evening										
Lunch	27.4	57.1	17.8	40.6	30.8	65.2	24.0	64.8	100.0	56.8
Dinner	27.0	42.9	34.2	59.4	21.6	34.8	17.1	35.2	100.0	43.2
Total	27.2	100.0	24.9	100.0	26.8	100.0	21.0	100.0	100.0	100.0
Gender										
Female	26.4	52.9	27.1	59.4	23.6	47.8	22.9	59.3	100.0	54.5
Male	28.2	47.1	22.2	40.6	30.8	52.2	18.8	40.7	100.0	45.5
Total	27.2	100.0	24.9	100.0	26.8	100.0	21.0	100.0	100.0	100.0
First visit										
No	24.7	67.1	26.8	79.7	25.8	71.0	22.6	79.6	100.0	73.9
Yes	34.3	32.9	19.4	20.3	29.9	29.0	16.4	20.4	100.0	26.1
Total	27.2	100.0	24.9	100.0	26.8	100.0	21.0	100.0	100.0	100.0
Floor										
Ground Floor	23.7	31.4	30.1	43.8	29.0	39.1	17.2	29.6	100.0	36.2
Mezzanine	30.0	38.6	20.0	28.1	32.2	42.0	17.8	29.6	100.0	35.0
Basement	28.4	30.0	24.3	28.1	17.6	18.8	29.7	40.7	100.0	28.8
Total	27.2	100.0	24.9	100.0	26.8	100.0	21.0	100.0	100.0	100.0

Payment by observed and coming alone

Table 12: Payment by Observed and Alone

Alone at table	Observed		Total
	No	Yes	
	Mean payment	Mean payment	Mean payment
No	5.47	4.96	5.20
Yes	4.52	5.68	4.91
Total	5.29	5.03	5.16

Figure 5: Map of the Wiener Deewan



A.3 Floor Plan

Payment per Quality

Table 13: Average payment per quality

Quality	Mean payment	Sd payment	Mean age
1 (0%)	4.00		27.00
2 (3%)	4.20	1.92	25.00
3 (12%)	4.45	1.48	26.50
4 (51%)	5.13	1.71	26.85
5 (31%)	5.60	1.64	29.11
Total (100%)	5.16	1.71	27.45

Testing for differences in the average payment for quality levels 2 and 3, define $diff = averagepayment_2 - averagepayment_3$ and the null hypothesis is $H_0 : diff = 0$

$H_a : diff < 0$	$H_a : diff \neq 0$	$H_a : diff > 0$
$\Pr(T < t) = 0.0074$	$\Pr(T > t) = 0.0149$	$\Pr(T > t) = 0.9926$
degrees of freedom = 84		

A.4 More Regressions...

Different definitions of the group influences

Table 14: Comparison of Different definitions for $f(a_{n(i)})$

	(1) f_average	(2) f_total	(3) f_first
Treatment 2	0.26 (1.09)	0.29 (1.22)	0.047 (0.31)
Treatment 3	0.22 (0.92)	0.38 (1.53)	0.0086 (0.05)
Treatment 4	0.36 (1.58)	0.42 (1.79)	0.11 (0.76)
Second Order Expectations	0.31*** (5.76)	0.38*** (6.52)	0.19*** (4.98)
Estimated production costs	0.14* (2.19)	0.16* (2.37)	0.072 (1.64)
firsttime=1	0.17 (0.82)	0.28 (1.34)	0.17 (1.29)
comeagain=1	0.33 (1.33)	0.50* (2.02)	0.13 (0.82)
comeagain=9	0.092 (0.35)	0.13 (0.48)	-0.037 (-0.22)
Reportedly reciprocal	0.73*** (4.01)	0.79*** (4.29)	0.36** (3.04)
Age	0.086 (1.24)	0.20** (2.93)	-0.025 (-0.56)
Age squared	-0.00056 (-0.58)	-0.0019* (-2.00)	0.00063 (0.99)
Average payment of others	0.37*** (6.24)		
Total payment of others		0.031 (1.75)	
avpay_ft0_i			0.79*** (16.83)
_cons	-1.64 (-1.48)	-2.61* (-2.36)	-0.34 (-0.47)
Observations	169	198	198
Adjusted R^2	0.628	0.528	0.810

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

All coefficient of interest stay nearly unchanged, while the coefficient on the intention to come again becomes significant at the 5% level.

Tobit regressions

Seperate regressions for different groups

References

George A. Akerlof. Labor Contracts as Partial Gift Exchange. *The Quarterly Journal of Economics*, 97(4):543–569, nov 1982. ISSN 0033-5533.

Table 15: Tobit Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Payment	Payment	Payment	Payment	Payment	Payment	Payment
model							
Treatment 2	0.36 (1.50)	0.089 (0.39)	-1.12 (-1.48)		0.19 (0.80)	0.26 (1.13)	1.42 (1.44)
Treatment 3	0.60* (2.34)	0.38 (1.57)	-1.21 (-1.24)	-0.19 (-0.16)	0.39 (1.61)	0.22 (0.96)	3.38*** (3.49)
Treatment 4	0.27 (1.07)	0.19 (0.83)	-1.34 (-1.62)	-2.01* (-2.49)	0.38 (1.66)	0.36 (1.64)	1.16 (0.85)
Second Order Expectations	0.59*** (11.67)	0.52*** (10.85)	0.17 (1.55)	0.43** (3.13)	0.42*** (7.54)	0.31*** (6.00)	0.36*** (7.71)
Age		0.23*** (4.30)	0.21** (3.22)	0.10 (1.34)	0.19** (2.95)	0.086 (1.30)	-0.0077 (-0.10)
Age squared		-0.0025*** (-3.42)	-0.0022* (-2.33)	-0.00087 (-0.80)	-0.0019* (-2.04)	-0.00056 (-0.60)	0.00069 (0.67)
_ItrXexpec_2		0.24 (1.83)	0.24 (1.83)	-0.31 (-1.77)			
_ItrXexpec_3		0.30 (1.74)	0.30 (1.74)	0.094 (0.41)			
_ItrXexpec_4		0.32* (2.23)	0.32* (2.23)	0.046 (0.27)			
Estimated production costs		0.18** (2.68)	0.18** (2.68)	0.23** (3.00)	0.15* (2.35)	0.14* (2.28)	0.044 (0.88)
comeagain=1		0.55* (2.25)	0.55* (2.25)	0.95** (2.69)	0.36 (1.49)	0.33 (1.39)	0.034 (0.13)
comeagain=9		0.18 (0.70)	0.18 (0.70)	0.69 (1.75)	0.051 (0.20)	0.092 (0.36)	-0.023 (-0.09)
Reportedly reciprocal		0.76*** (4.28)	0.76*** (4.28)	0.90*** (4.57)	0.72*** (4.16)	0.73*** (4.17)	0.77*** (5.33)
Evening		0.34 (1.97)	0.34 (1.97)	-0.11 (-0.55)			
_Iobserved_1		-2.11* (-2.19)	-2.11* (-2.19)	-2.11* (-2.24)			
Alone at table		-0.66* (0.65)	-0.66* (0.65)	0.33 (0.65)			
_IobsXalone_1		0.0035 (0.07)	0.0035 (0.07)	0.0035 (0.07)			
Visited in the last month							
First visit							
_Iegroupsiz_2		0.42* (2.08)	0.42* (2.08)	0.42* (2.08)	0.42* (2.08)	0.17 (0.85)	0.25 (1.38)
_Iegroupsiz_3		0.55* (2.31)	0.55* (2.31)	0.55* (2.31)	0.55* (2.31)		
_Iegroupsiz_4		0.47 (1.77)	0.47 (1.77)	0.47 (1.77)	0.47 (1.77)		
_Iegroupsiz_5		0.29 (0.82)	0.29 (0.82)	0.29 (0.82)	0.29 (0.82)		
_Iegroupsiz_8		0.044 (0.08)	0.044 (0.08)	0.044 (0.08)	0.044 (0.08)		
Average payment of others		-1.44* (-2.27)	-1.44* (-2.27)	-1.44* (-2.27)	-1.44* (-2.27)		
_cons	1.59*** (5.07)	-2.21* (-2.52)	-1.61 (-1.34)	0.52 (0.36)	-2.60* (-2.42)	0.37*** (6.49)	-0.43 (-0.29)
sigma							
_cons	1.32*** (21.31)	1.23*** (21.31)	1.11*** (19.90)	0.97*** (16.19)	1.09*** (19.90)	1.00*** (18.38)	0.59*** (19.90)
_Igroup*	No	No	No	No	No	No	Yes
Observations	227	227	198	131	198	169	198
Pseudo R ²	0.129	0.167	0.215	0.216	0.226	0.273	0.538

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: OLS regression by treatment, reciprocal and student

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	full comm.	limit. comm.	full comm. SI	limit comm. SI	No	Yes	No	Yes
Second Order Expectations	0.24* (2.25)	0.39** (3.35)	0.46** (2.82)	0.46*** (3.80)	0.43*** (4.21)	0.35*** (4.96)	0.47*** (3.84)	0.33*** (4.91)
Age	0.31** (2.83)	0.44 (1.29)	0.18 (1.50)	-0.0035 (-0.03)	0.31* (2.50)	-0.59 (-1.97)	0.11 (0.96)	0.26** (3.10)
Age squared	-0.0035* (-2.35)	-0.0058 (-1.05)	-0.0021 (-1.26)	0.0011 (0.59)	-0.0034* (-2.10)	0.013* (2.15)	-0.00093 (-0.55)	-0.0029* (-2.34)
Estimated production costs	0.022 (0.16)	0.29* (2.05)	0.10 (0.56)	0.088 (0.70)	0.19 (1.08)	0.18** (2.64)	0.020 (0.17)	0.23** (2.65)
comeagain==1	1.37* (2.22)	0.83 (1.69)	-0.33 (-0.75)	0.099 (0.16)	0.64 (1.48)	0.52 (1.65)	-0.0070 (-0.02)	0.78* (2.51)
comeagain==9	1.63* (2.47)	-0.12 (-0.19)	-0.13 (-0.29)	-0.049 (-0.08)	-0.35 (-0.71)	0.59 (1.75)	0.28 (0.61)	0.45 (1.34)
Reportedly reciprocal	1.21*** (4.01)	0.23 (0.49)	0.16 (0.42)	0.95** (2.75)	0.63 (1.67)	0.80*** (4.10)		
Evening	-0.44 (-1.37)	0.68 (1.55)	0.17 (0.53)	1.04** (2.89)	0.91* (2.54)	0.16 (0.82)	-0.20 (-0.62)	0.65** (2.94)
treatment==2					0.21 (0.46)	0.092 (0.32)	0.52 (1.32)	-0.14 (-0.45)
treatment==3					0.13 (0.26)	0.52* (2.04)	1.15* (2.22)	0.20 (0.68)
treatment==4					0.58 (1.07)	0.33 (1.42)	0.40 (1.11)	0.41 (1.37)
Constant	-3.88* (-2.18)	-6.39 (-1.27)	-0.60 (-0.25)	0.64 (0.29)	-4.98* (-2.22)	7.69* (2.09)	-0.77 (-0.37)	-2.94* (-2.15)
Observations	53	53	43	49	77	121	63	135
Adjusted R ²	0.451	0.526	0.507	0.625	0.504	0.456	0.466	0.479

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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