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Do voluntary payments to advisors improve the quality of financial advice? An experimental sender-receiver game

by

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Do voluntary payments to advisors improve the quality of financial advice? An experimental sender–receiver game[‡]

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Abstract

The market for retail financial products (e.g. investment funds or insurances) is marred by information asymmetries. Clients are not well informed about the quality of these products. They have to rely on the recommendations of advisors. Incentives of advisors and clients may not be aligned, when fees are used by financial institutions to steer advice. We experimentally investigate whether voluntary contract components can reduce the conflict of interest and increase truth telling of advisors. We compare a voluntary payment upfront, an obligatory payment upfront, a voluntary bonus afterwards, and a three-stage design with a voluntary payment upfront and a bonus after. Across treatments, there is significantly more truthful advice when both clients and advisors have opportunities to reciprocate. Within treatments, the frequency of truthful advice is significantly higher when the voluntary payment is large.

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1 Introduction

For a number of important economic decisions consumers depend on experts to give them advice. Our main example is the market for retail financial products, others include health care advice or lawyer-client relationships. While the experts are better-informed about the quality of products/services, giving truthful advice to clients may not always coincide with the monetary interest of the expert. In fact, a conflict of interest is rather common. In this paper we use a principal-agent framework to illustrate the origin of the conflict of interest, describe the negative consequences of moral hazard on market efficiency, and test a potential remedy to reduce market failure.

Crawford and Sobel (1982) pioneered the economic analysis of such strategic information transmission. In their sender-receiver model, the incentive of the informed sender to misreport information to the uninformed receiver increases with the conflict of interest. Our experimental study uses a modified sender-receiver game in order to analyze advisor (sender/agent) and client (receiver/principal) behavior in a stylized market for financial advice. A frequent finding in experimental sender-receiver games (see, for instance, Cai and Wang, 2006; Sánchez-Pagés and Vorsatz, 2007) is that senders tell the truth more often than predicted by standard Bayesian Nash equilibrium analysis, a behavioral pattern termed "overcommunication phenomenon".

While our study tries to shed some light on the underlying motivations for overcommunication, most importantly it introduces an instrument that affects the level of overcommunication. We permit clients to make voluntary payments to the advisor before and/or after the actual interaction. More specifically, our experiment

compares a voluntary payment upfront, an obligatory payment upfront, a voluntary bonus afterwards, and a voluntary payment upfront plus a bonus afterwards. This design allows us to investigate, whether such voluntary contract components can reduce the conflict of interest and increase truth telling of advisors. We can also test whether the size of the voluntary payment improves information transmission, since clients can select from five different upfront payments.

Our motivation to incorporate mutual opportunities to reciprocate as an instrument to improve information transmission originates from the success of voluntary components to alleviate moral hazard problems in principal-agent situations.[1] Traditional principal-agent theory propagates the use of incentives in order to reduce agency costs caused by moral hazard. Incentive contracts, for instance, help to align the interests of agent and principal as Lazear (2000) and others show and lead to a second-best. 'Behavioral' principal-agent theory suggests an alternative route to reach a second-best. Instead of using explicit instruments like monitoring etc., contracts are deliberately left open and principals as well as agents are free to make choices that are higher than the necessary minimum. Such a design leaves room to reciprocate kind actions. Depending on the strength of available incentive instruments it may be more promising to use voluntary contract components. Appealing to trust, intrinsic motivation, and reciprocity concerns of principal and agent may lead to a better second-best than the one achievable through incentive instruments.

Arguably, voluntary components have been considered most prominently in labor markets. Based on the empirical observation that employers often pay higher wages and workers exert more than the minimum effort level, the work of Akerlof (1982), and Akerlof and Yellen (1988, 1990) on efficiency wages suggests that generous

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[1]In addition it is supported by Popova (2010) who finds increased truth-telling of advisors in an experimental sender-receiver game with (voluntary) upfront payments.

wages – if perceived as fair – would increase the morale of workers and, in turn, their productivity. The fair wage hypothesis has been tested in numerous gift-exchange lab experiments (Fehr et al., 1993, 1998, 2007). Generally, these studies use a two-stage design, that is, a firm sets a wage and a worker then chooses an effort level, and evidence of a positive wage-effort relationship abounds. Findings of positive reciprocity in gift-exchange labor market contexts are harder to find in the field.[2] However, empirical support in favor of reciprocity is clear-cut when a three-stage gift-exchange design is used. To the best of our knowledge only three studies analyze a gift exchange context that features a possible bonus payment as a third stage. Laboratory (Fehr, Gächter and Kirchsteiger, 1997; and Fehr, Klein and Schmidt, 2007) as well as field (Regner, 2009) experiments report significantly higher effort levels with a third bonus stage than without. Given the mixed empirical results for the two-stage design and the distinctly positive ones for the three-stage design, it may be important to provide mutual opportunities to reciprocate in order to reap the benefits of reciprocity. Hence, we expect that a third stage, a possible bonus payment from client to advisor, may also be beneficial in the experimental sender-receiver game in the context of financial advice.

In our experiment, the frequency of truthful advice increases with the number of opportunities to reciprocate, i.e., the three-stage design is most successful in combatting moral hazard. Within treatments, the frequency of truthful advice is significantly higher, when the voluntary payment is large. Clients follow advice, when

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[2]List (2006) finds a positive relationship that is, however, mostly attributable to reputation. Gneezy and List (2006) show evidence for positive reciprocity but the effect fades away over time. The evidence in favor of positive reciprocity in Maréchal and Thöni (2007) depends on environmental factors. Bellemare and Shearer (2009) do find evidence for reciprocal behavior among workers. Kube et al. (2006) and Hennig-Schmidt et al. (2009) find no evidence for positive reciprocity. All these studies use two-stage designs.

they pay for it, especially when the payment is large and voluntary.

Our paper is part of the growing experimental literature on strategic information transmission. Cai and Wang (2006) report overcommunication in strategic information transmission games, that is, senders tend to transmit more information than predicted by the standard equilibrium analysis, and receivers trust more often. However, taking into account noisy behavior by applying a logit agent quantal response equilibrium (players have correct beliefs about their opponents but do not maximize their payoffs perfectly given their beliefs) explains the communication patterns well. Sánchez-Pagés and Vorsatz (2007) show that some subjects tell the truth even more often than predicted by the logit agent quantal response equilibrium. They explain this finding with the preference to follow social norms. Other studies suggest alternative explanations. Gneezy (2005) finds that the extent of lying is sensitive to the potential gains of the sender and the potential losses of the receiver and relates his results to models of let-down/guilt aversion (see Battigalli and Dufwenberg (2009) for a formal framework). Hurkens and Kartik (2009) propose that the cost of lying is constant (either zero or infinite) and not increasing in own gains and decreasing in other's losses. Erat and Gneezy (2011) show that even if a lie is Pareto improving a considerable number of people are reluctant to lie.

In addition to our main research question, our design allows to assess the predictions of some social preferences models used in those prior studies to explain overcommunication tendencies, namely, distributional concerns, guilt aversion, and lying aversion. While our results are in line with guilt aversion, evidence with respect to distributional concerns or lying aversion is mixed. The inequity aversion model of Fehr and Schmidt (1999) cannot explain that truthful advice is given at all payment levels. A non-negative cost of lying in the sense of Ellingsen and Johannesson (2004), Chen et al. (2008) or Kartik (2009) can explain the rate of truth telling when advi-

sors pay zero. The lying aversion hypothesis of Hurkens and Kartik (2009) stands at odds with the increasing rate of truthful advice across upfront payments that we observe.

Our study introduces an additional instrument to the standard sender-receiver game to analyze its effect on the level of overcommunication. A few other studies take a similar approach. Sánchez-Pagés and Vorsatz (2009) analyze whether the ex-post possibility to punish changes behavior in the sender-receiver game. They do not find an effect on the rate of truth-telling. However, receivers trust more often. Instead of a 'negative' instrument like punishment we investigate a 'positive' one, and find that voluntary payments have a positive effect, both on truth-telling, as well as trust. Our bonus treatment is similar to the experiment by Peeters et al. (2008) who study a sender-receiver game with/without the possibility to reward in a within-subjects design. While rewards enhance trust, they do not increase truth-telling. In contrast, our results indicate that the possibility to pay a bonus increases the rate of truthful advice as well as trust in the advice given. Our results are in line with Popova (2010) who finds that a positive upfront payment by the receiver significantly increases truth-telling by the sender.

The paper is organized as follows. Section 2 provides some background on the market for financial advice and leads to our experimental design using a motivating example. In section 3 we describe the experiment. Results are presented in section 4 and discussed in section 5. Section 6 concludes.

2 The Market for Financial Advice

Certainly, investing one's savings is one of the most important economic activities. However, choosing the right financial product (stocks, bonds, investment funds, life insurances, etc.) is by no means an easy feat. In fact, to most consumers the market for retail financial products must appear like a jungle.[3] Hence, advice is dearly needed and consumers turn to expert intermediaries who provide advice concerning financial products. While such financial advisors could be paid a fee by clients for their consulting services, it is much more common in reality that they do not charge their clients.[4] Instead, financial advisors receive commissions paid by financial institutions per product sold to clients. It is controversial, at best, whether consumers really get a good deal in a commission-based system of financial advice despite not having to pay a fee. In the remainder of this section we illustrate the conflict of interest between advisor and client that exists in the commission-based system of financial advice, and describe the negative consequences of this moral hazard on market efficiency. Thus, we relate the commissions-based market for financial advice to the sender-receiver game.

Our stylized market for financial advice[5] features a client who is eager to invest, several financial institutions (funds) who compete for the client's investment, and an advisor who recommends a fund to the client.

The advisor receives a basic commission, say 5, from the fund that is chosen for

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[3]The amount of publicly listed financial products is estimated to be 840,000 and financial institutions issue new innovative products at a steady rate, see von der Hagen (2012).

[4]Only in Scandinavian countries it is common that financial advisors are paid a fee by clients for their consulting. The commission-based system dominates in the USA, Germany, the UK.

[5]We do not consider matching aspects, i.e., products are equally suitable to all consumers.

investment. If a fund attracts the investment of the client, this fund makes a profit of 10, the other fund gets nothing. There is heterogeneity in fund performance, that is, fund A pays out 5 to the client, and fund B 10. Table 1 shows 'payoffs' in the stylized market for the client and the two funds.

Option	Advisor	Client	Fund A	Fund B
A	5	5	10	0
B	5	10	0	10

Table 1: Payoffs with two funds

Hence, it is better for the client, but also preferable from an efficiency perspective, to invest in the better performing fund B. Clearly, the advisor should recommend fund B to the client. However, incentives exist for the low-performing fund A to influence the advisor's recommendation. In turn, this would have an effect on the client's investment decision. Since fund A would not be bought if the advisor recommends truthfully to the client, fund A may try to influence the recommendation of the advisor by increasing the commission.[6] In our example, fund A pays a high commission (10 instead of 5) to the advisor. Table 2 shows 'payoffs' when fund A uses commissions to steer advice.

The conflict of interest – and its origin – is now evident. Interests of client and advisor are not aligned, because (especially low-performing) funds have an incentive to abuse the commission system in order to steer advice.

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[6]Inderst and Ottaviani (2011) model the steering of advice formally. Two firms compete to sell a product to an uninformed customer who is advised by an informed intermediary. The two firms use commissions paid to the intermediary to steer advice. The authors show that it becomes increasingly costly for a cost-efficient firm to expand sales, because the higher commission must be paid inframarginally, i.e., also to those intermediaries who would have advised in favor of the cost-efficient firm anyway.

Option	Advisor	Client	Fund A	Fund B
A	$5 + 5$	5	$10 - 5$	0
B	5	10	0	10

Table 2: Payoffs with two funds and commission steering

As a last step our motivating example adds more funds in order to be closer to reality. The funds C and D are very low-performing, and we assume that they do not steer commissions. In reality one fund would not commission-steer all existing advisors, but only a subset. Other funds commission-steer other advisors and the subsets possibly overlap. The advisor in our motivating example is in the subset of only one fund, and thus only this fund uses commissions to steer advice. Table 3 shows 'payoffs' with four funds and commission steering by fund A. Each fund only gets revenue when it is chosen by the client. Fund A's profit is reduced, because it pays an extra commission in order to steer advice.

Option	Advisor	Client	Fund A	Fund B	Fund C	Fund D
A	10	5	5	0	0	0
B	5	10	0	10	0	0
C	5	2	0	0	10	0
D	5	2	0	0	0	10

Table 3: Payoffs with four funds and commission steering

Summing up, the market for financial advice suffers from moral hazard. The combination of asymmetric information (advisor knows the product quality, the client does not) and advisors being paid by funds creates a potential conflict of interest. When funds use commissions in order to steer advice, the conflict of interest becomes real and incentives of client and advisor are misaligned. This may lead to (i) biased advice for the client, and (ii) an inefficient allocation of resources due to investment

in a low-performing fund.

The conflict of interest in the market for retail financial products has been debated in the international press for years (see, e.g., Popova, 2010). Recently also government bodies recognized the misaligned incentives between clients and advisors, and have started to take action. A UK Financial Services Authority regulation prevents financial advisors in the UK from accepting commissions (effective from 2012). A new EU legislation (Mifid II, planned for 2014) envisions a shift away from the commission-based system to fee-based financial advice. Its article 24/3 requires that financial advisors clearly state, whether they are independent or whether any conflicts of interest exist. Independent financial advisors would not be allowed to accept any commission or other monetary side payments of third parties. In a similar vein a law proposition by the German minister for consumer protection dated 2011, although not forbidding commissions-based advising, legally defines and protects the profession of the fee-based advisor (Honorarberater), to facilitate the distinction between fee-based advisors and commissions-based sales people. Since German authorities do not intend to forbid commissions-based advice, we suggest an alternative that combines commissions with (voluntary) fees and test whether it is effective in combatting moral hazard of advisors.

3 Experiment

3.1 Design

Our experiment was designed to analyze behavior in a stylized market for financial advice. As a workhorse we used a sender–receiver game. Subjects were randomly

assigned a role of an advisor or client, which they kept throughout the entire experiment. The experiment consisted of 15 rounds. At the beginning of each round, each advisor was matched to a client. Then, only the advisors learned which state of the world was realized. State here is another word for the allocation of options to payoffs (in our case payoff pairs). Options were called A, B, C, and D. The payoff pairs were (10, 5); (5, 10); (5, 2); (5, 2) with the payoff for the advisor listed first and that for the client – second. In the different states of the world, different payoff pairs were allocated to the same option. For instance, in one state of the world, option A gave 10 tokens to the advisor and 5 to the client; in another state, the same option yielded 5 to the advisor and 2 to the client. One possible state realization, as advisors saw it, is given in Table 4.

Option	Payoff for advisor	Payoff for client
A	10	5
B	5	10
C	5	2
D	5	2

Table 4: A possible state realization; all payoffs in tokens, 1 token = 0.5 euros

Clients were informed about the possible payoff pairs, so that they were aware of the alignment of interests, as well as their own and the advisor's possible payoffs. However, clients were not informed what state of the world was realized, i.e., which payoff pair was assigned to which option. They had to choose one option, based solely on the advisor's recommendation. There were four possible recommendations the advisor could give. For example, recommendation 1 read: "Option A will earn you more money than the other three options." Instead of showing the recommended option to the client, she was asked whether she wanted to follow the recommendation. If the answer was yes, the recommended option was implemented as her decision. If

it was no, one of the other three options was randomly selected to be implemented as her decision. At the end of each round, both clients and advisors received feedback about which option was selected and their resulting payoffs. Advisors were also told whether the client followed the recommendation or not.[7] Payoffs from the chosen option were added to their initial endowment of 2.5 tokens (paid in each round) to form the final payoff from the round. Two out of 15 rounds were randomly selected and paid out in the end of the experiment. In the next round, the same advisor was matched to another client and the round followed the same pattern like the round before. The advisor–client matches were carried out within the same group of 10 subjects (5 advisors and 5 clients). Thus, each advisor met each client 3 times, but we made sure that the same advisor did not meet the same client in two subsequent rounds. One group of 10 subjects (who only met subjects from the same group) qualified as one independent observation. We chose a random stranger matching protocol to minimize strategic effects from repeated play.

The parametrization of payoffs and the number of options have the following rationale. We wanted to model the conflict of interest, that is, there had to be one best option for the advisor and another one, best for the client. Considering Table 4, these would be options A and B. Since advisors are paid the same for all options but A, and since options C and D are dominated for the client, the relevant choice for the recommendation of the advisor should be between options A and B (if the advisor is not spiteful). Options C and D are needed mainly to prevent advisors from giving truthful advice with the back thought of deceiving clients, as shown by Sutter (2009).[8]

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[7]Of course, advisors were able to infer whether the client followed the advice based on their own payoff.

[8]In a two options environment, with one option being profitable for the advisor, and the other one being profitable for the client, advisors recommend the profitable option for the client, believing

The experiment consisted of four different treatments summarized in Table 5. The setup described so far was common to all treatments. In the following the differences between treatments will be explained.

Treatment	Abbrev.	Subjects	Sessions
Voluntary payment	V	60	2
Voluntary payment and Bonus	VB	60	2
Bonus	B	60	2
Obligatory payment	O	60	2

Table 5: Treatments

In treatment "Voluntary payment" (V), clients could offer a voluntary payment between 0 and 2 tokens in steps of 0.5 to the advisor for the recommendation. The voluntary payment was financed by the initial endowment of the client. Advisors were first not informed about the amount of the voluntary payment offered by her client. Each advisor was asked to give a recommendation for every possible offer of the client, i.e. for 0, 0.5, 1, 1.5, 2 tokens (Strategy method, Selten, 1967). Subsequently, the client received the recommendation that corresponded to her offer.

In treatment "Voluntary payment and Bonus" (VB), there was an additional step compared to treatment V. After the client was informed about her payoff from the round, she could pay a non-negative bonus up to her full earnings from the round to her advisor.

The only difference between treatment VB and treatment Bonus (B) was the lack of an upfront voluntary payment in B. Clients were given a recommendation and could offer a bonus after they received feedback about their earnings.

that clients will invert advice, i.e., choose the option that was not recommended. See Rode (2010) and Popova (2010) for approaches that are similar to ours.

Treatment "Obligatory payment" (O) was our control treatment. Here, there still was an upfront payment for advice but intentions behind the payment were missing. Thus, the comparison between O and V can shed light on whether equalization of payoffs alone or reciprocity, or maybe both, are the driving forces behind the quality of the recommendation. In O, clients were informed that they would have to make a payment to the advisor and that the amount to be paid would be chosen by the computer. Like before, advisors were asked to give a recommendation for each possible payment between 0 and 2 tokens. Clients in turn were asked to state whether they would follow the recommendation for each possible payment. In the end, everyone learned the amount of payment chosen by the computer and their final payoffs from the round (based on the corresponding recommendation for that payment amount). To ensure direct comparability with treatment V, payments in O followed the distribution of voluntary payments in V.[9]

Table 6 summarizes the course of events in every treatment.

3.2 Procedures

We performed 2 sessions per treatment or 8 sessions altogether. 60 subjects participated in each treatment and each subject was observed 15 times. In each session of 30 subjects, there were 3 distinct matching groups (of 10) which qualify as independent observations. Consequently, there were 6 independent observations per treatment. In total, 240 undergraduate students from the University of Jena were recruited for this experiment with the help of the online recruitment system for eco-

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[9]In order to make sure that the only difference between V and O are intentions, O–sessions were run after V–sessions and payments in O were hard-wired based on the actual payments in V, that is, payments of each client in each round were equal in V and O.

Treatment Voluntary payment (V)	
CL decides about her voluntary payment (1D).	
AD gives advice for every possible voluntary payment (5D).	
CL decides whether to follow advice (1D).	
Feedback about payoffs.	
Treatment Voluntary payment and Bonus (VB)	
CL decides about her voluntary payment (1D).	
AD gives advice for every possible voluntary payment (5D).	
CL decides whether to follow advice (1D).	
Feedback about payoffs.	
CL decides about AD's bonus.	
Feedback about bonus.	
Treatment Bonus (B)	
AD gives advice (1D).	
CL decides whether to follow advice (1D).	
Feedback about payoffs.	
CL decides about AD's bonus.	
Feedback about bonus.	
Treatment Obligatory payment (O)	
Exogenous determination of the payment by CL (according to the distribution in V).	
AD gives advice for every possible payment (5D).	
CL decides whether to follow advice for every possible payment (5D).	
Feedback about payoffs.	

Table 6: The course of events in every round for each treatment
Note: AD = Advisor, CL = Client, D = Decision(s)

nomic experiments ORSEE (Greiner, 2004). An additional 30 subjects took part in the pilot session. On average, subjects earned around 12 Euros and spent 90 minutes (15 minutes of which on the instructive part) in the laboratory of the Max Planck Institute of Economics in Jena, Germany. The sessions took place in January 2011.

Upon arrival in the laboratory, subjects were randomly assigned to a cubicle, where they individually read the instructions.[10] Then instructions were also read aloud by the same experimenter. After answering a number of questions, which checked the understanding of the instructions, subjects participated in the computerized[11]

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[10]See the Appendix for a translation of the instructions.

[11]The experiment was programmed in z-Tree (Fischbacher, 2007).

experiment. Subjects were allowed to ask clarifying questions at any time and questions were answered by the experimenters in private. During the experiment, eye contact with other subjects was not possible. Although participants saw each other at the entrance of the laboratory, there was no way for them to guess with whom of the 30 students they would be matched later on. 94% of subjects had participated in at least one experiment before.

4 Results

In analyzing the results we will follow the development of the game. First, we will check whether clients offer upfront payments. Second, we will discuss the quality of advice conditional on the upfront payments. Third, we will ask whether and when clients follow advice. Forth, we will consider bonuses paid. Last, we will look at individual differences in behavior and payoffs.

4.1 Do clients pay voluntarily?

Voluntary Payment	0	0.5	1	1.5	2
Treatment V (in %)	57	19	7	3	15
Treatment VB (in %)	51	12	12	5	20

Table 7: Voluntary payments upfront, $N = 450$ decisions

Table 7 shows the percentage of voluntary payments in treatments V and VB. 43% of the decisions in V and half of the decisions in VB are in favor of paying for advice. The most prominent amounts are the smallest (0.5) and the largest (2).

Figure 1 depicts the share of clients who pay a given amount in each round. Also over time the most frequently offered amounts are 2 (in both V and VB) and 0.5
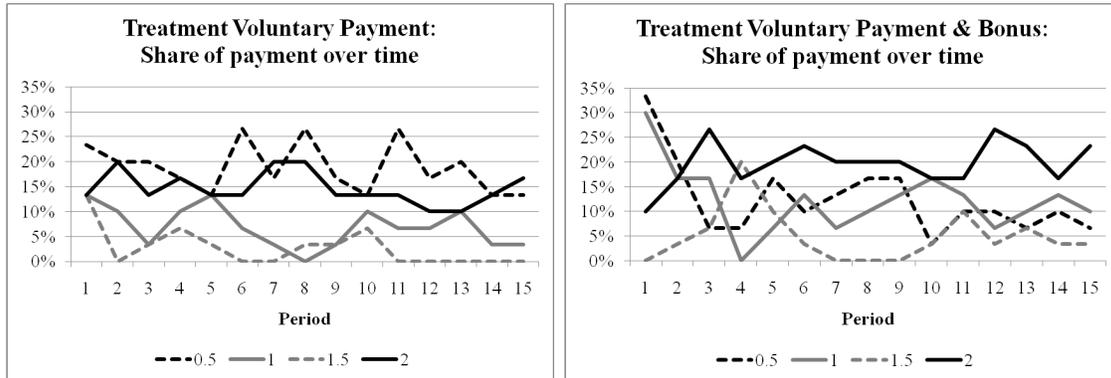
(in V).

Figure 1: Voluntary payments over time in treatments V and VB

In order to test for possible effects over time we ran an ordered logit regression with standard errors clustered at the individual level for treatments V and VB. The dependent variable is the upfront voluntary payment (taking the values 0, 0.5, 1, 1.5, 2). We regressed this variable on round (going from 1 to 15) and another dummy variable that accounts for good experience made one round before, i.e., the client received truthful advice and followed it. Regression results are shown in Table 8. The coefficient for the variable "round" is negative and significant at the 5%-level in treatment V, but not significantly different from 0 in VB. This means that voluntary payments are fading away over time in V. However, in VB they are stable over time. A positive experience with trusting advice in the previous round has a substantial positive effect on the size of the upfront payment.

Result 1 : *Clients are willing to pay voluntarily for advice. The share of clients who offer a voluntary payment is stable over time, when mutual opportunities to reciprocate exist.*

DV: upfront payment	treatment V		treatment VB	
	coeff.	st.error	coeff.	st.error
round	-.0493	.0239 **	-.0133	.0232
good experience	2.072	.387 ***	1.786	.3196 ***
constant	-.2115	.2802	-.3332	.3228
N	420		420	
Log likelihood	-455.73		-523.38	

significance levels: $*** = 1\%, ** = 5\%, * = 10\%$

Table 8: Upfront payments over time

4.2 When do advisors give truthful advice?

Figure 2 shows the share of truthful advice (i.e., the recommended option pays 10 to the client) conditional on payment.

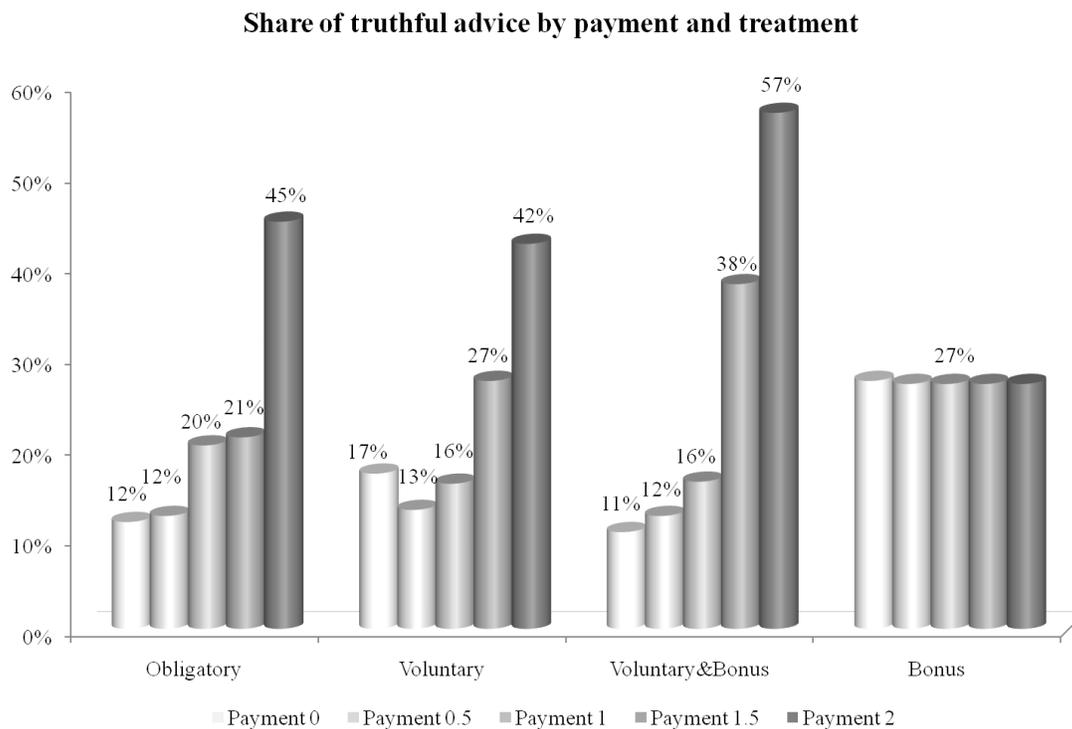**Share of truthful advice by payment and treatment**

Figure 2: Behavior of advisors conditional on payment; 450 decisions per bar

In treatments O and VB, payments of 1 or higher induce higher frequencies of

truthful advice compared to no payment (McNemar's test, $p = 0.000$). In treatment V, the payments 1.5 and 2 lead to significantly more truthful advice than no payment (McNemar's test, $p = 0.000$).[12]

Figure 3 depicts the share of truthful advice for the different sizes of payment over time. Also here, the generous upfront payments (of 2 and 1.5) are the effective ones. Logit random effects[13] regressions allow us to test whether truthful advice by payment and treatment is stable over time. Specifically, in O and V, we regressed a dummy for truthful advice on round. We ran a separate regression for each size of payment and treatment. In treatments VB and B, we included an additional regressor: bonus received by the advisor in the previous round. While results in O and V are mixed[14], in VB truthful advice is stable over time independently of the size of the payment. In B, truthful advice declines over time.

Result 2 : *Generous upfront payments (no matter whether obligatory or voluntary) induce advisors to give truthful advice. The share of truthful advice is stable over time only when mutual opportunities to reciprocate exist.*

Comparing the effect of the same amount paid across the different treatments yields the following results. The payment of 2 is more effective in VB than in V and O (the difference between O and V is not significant). The payment of 1.5 is most effective in VB, followed by V and O. The payments of 1 and 0.5 lead to the same

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[12]The McNemar's test is used for binary data and paired samples. Our data is binary since advice is either truthful or not. The samples are paired because the same advisor gives advice for each payment of 0, 0.5, 1, 1.5, and 2. We pairwise compared the distribution of decisions for the 0–payment to the distribution of decisions for each of the payments greater than zero.

[13]Random effects on the individual level account for the fact that subjects decide repeatedly.

[14]Specifically, in O, there is a negative time trend for payments 0 and 2, a positive one for 1, and no time trend for 0.5 and 1.5. In V, truthful advice fades away over time if the payment size is 1.5 or 2, increases for payment 0.5 and remains the same for 0 and 1.
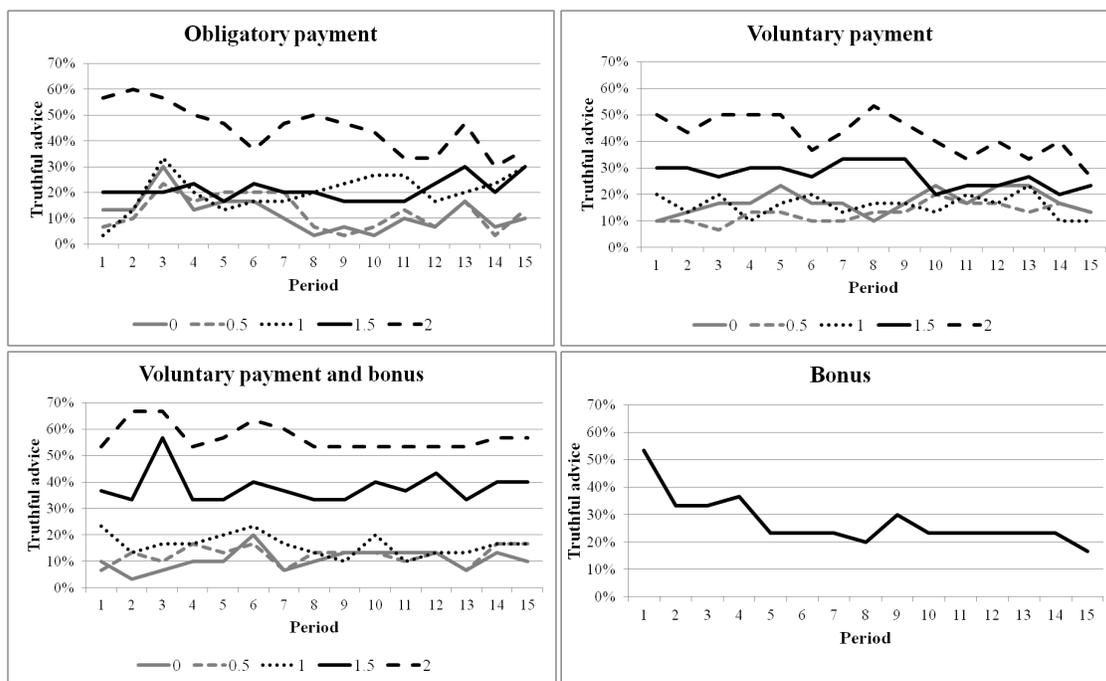
Figure 3: Truthful advice given payment over time

frequency of truthful advice in all treatments.[15]

Result 3 : *Keeping the amount of the payment constant, truthful advice is given most often in treatment VB.*

Apparently, the most effective among all payments is the voluntary one, which is combined with the hope for a bonus after the transaction.

In treatment B, 27% of advice given is truthful. This is equivalent to what the voluntary payment of 1.5 achieves in V and better than what the obligatory payment of 1.5 achieves in O (see Figure 3). In the first four rounds of Figure 3, the bonus in B induces between 35% and 55% truthful advice, which is comparable to the

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[15]The pairwise comparisons between treatments holding the amount paid constant were done with a χ^2–test. Given payment of 2, $p = 0$ for both VB vs. V, and VB vs. O; given payment of 1.5, $p = 0.001$ for VB vs. V, $p = 0$ for VB vs. O, and $p = 0.029$ for V vs. O.

effectiveness of the payment 2 in V and O. From round 5 onwards, the effectiveness of the bonus decreases: the bonus induces between 20% and 30% truthful advice which is similar to the impact of payments 1 and 1.5 in O and 1.5 in V.

4.3   When do clients follow advice?

Figure 4 depicts the share of clients who follow advice conditional on payment in each treatment. In general, clients who paid for advice, follow it more often than clients who did not pay.[16] However, there were three exceptions: the obligatory payment of 2 did not induce clients to follow advice more often than the payment of 0. This was the same in Popova (2010). Also the payments of 0.5 and 1.5 in V did not lead clients to follow advice more often than the payment of 0. For the payment 1.5, this may be due to the very low number of observations (N=12). We conjecture that 0.5 was perceived as too low. Judging from the behavior of advisors, they apparently had the same impression: they provided the same amount of truthful advice for payments 0 and 0.5 in all treatments.

If clients had paid for advice voluntarily and generously (either 1, or 1.5 or 2), they followed advice more often than in treatment O (χ^2–test and Fisher's exact test, $p \leq 0.01$).[17] There is no significant difference in the behavior of clients across treatments V and VB.

Clients do not change their behavior over time in any treatment and for any pay-

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[16]The pairwise comparisons between the behavior of clients at payment=0 and each of the other payments within each treatment yielded significant results for all treatments. In O, $p \leq 0.003$, McNemar's test. In V, $p \leq 0.001$ and in VB $p \leq 0.004$, χ^2–test (or Fisher's exact test for frequencies ≤ 5).

[17]Exception: Treatment V, payment 1.5, again probably due to the low number of observations.
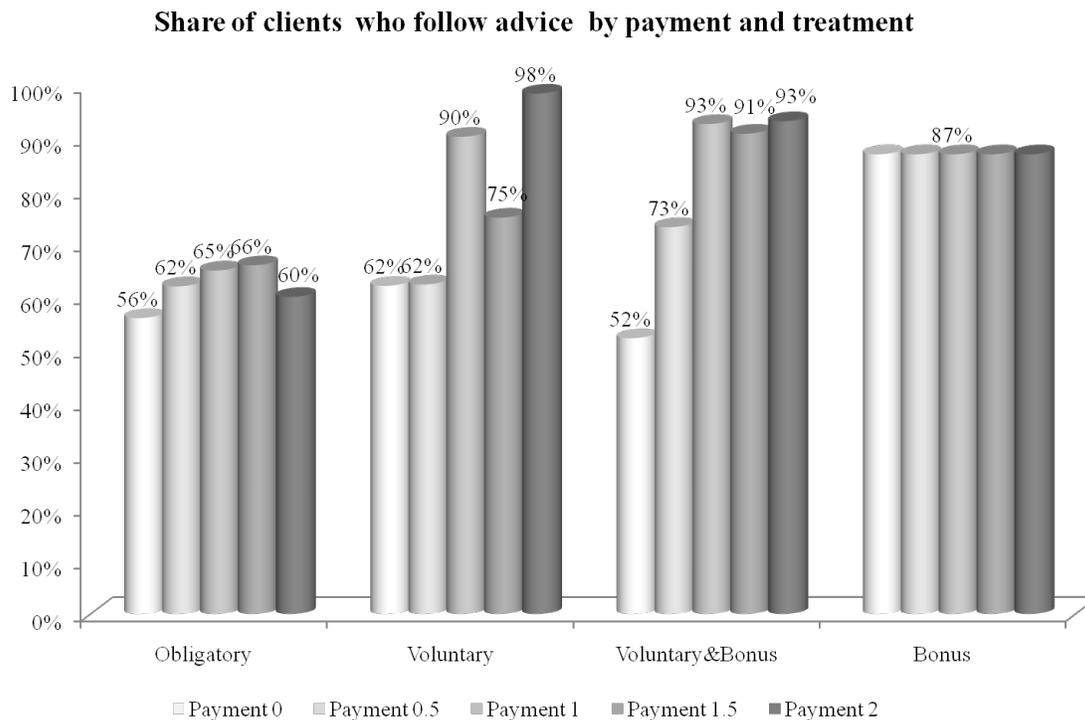
Share of clients who follow advice by payment and treatment

Figure 4: Behavior of clients

ment.[18]

Result 4 : *If clients pay for advice, they follow it.*

Result 5 : *If clients pay voluntarily and generously for advice, they follow it more often than when they pay the same amount unintentionally. The behavior of clients is stable over time.*

87% of clients in treatment B followed advice. This behavior is comparable to the behavior of clients who offered 1, 1.5, or 2 in V and VB.

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[18]Logit random effects regressions, regressing a dummy taking the value of 1 if the client follows advice on round, ran separately for each treatment and payment amount, never show a significant coefficient for round.

4.4 Do clients pay bonuses?

Table 9 lists the amount of bonuses paid and the percentage of times a bonus was paid in treatments B and VB. In both treatments, 20% of decisions are in favor of a bonus. The average bonus paid in B is higher than in VB (see also Figure 5). This is reasonable since in B advisors are only paid a bonus, while in VB the bonus can be combined with a voluntary payment.

Bonus	0	0.5	1	1.5	2	2.5	3	3.5
Treatment B (in %)	80	2	1	2	1	14	1	0
Treatment VB (in %)	80	12	3	2	1	1	.5	.5

Table 9: Bonus payments

There is a positive and significant correlation between the profit of clients and bonus paid. The correlation in VB (Spearman's $\rho = 0.4623$) is lower than in B (Spearman's $\rho = 0.5841$) but both are highly significant ($p = 0$). In other words, clients pay bonuses when satisfied with the advice received, which is intuitive.
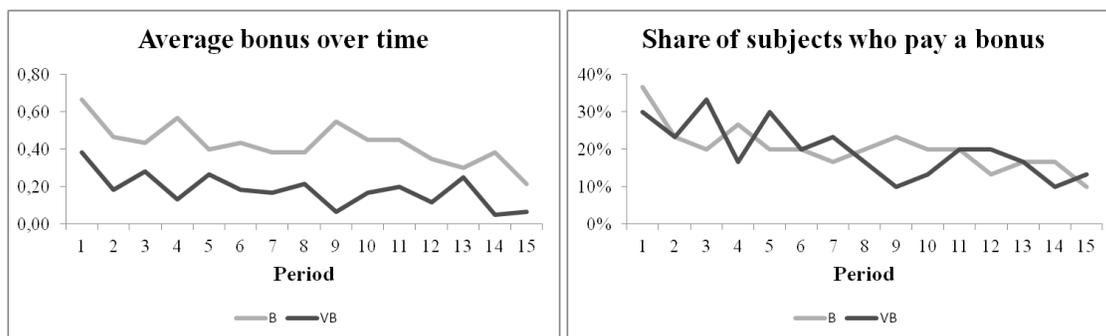

Figure 5: Average bonus and share of subjects who paid a bonus over time

Figure 5 plots the average bonus and the share of subjects who paid a bonus in each round. Both decrease over time.[19]

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[19]This is confirmed by a random effects regression of bonus (as a continuous variable) on round and a logit random effects regression on bonus (as a dummy) on round.

Result 6 : *One out of five decisions is to reward truthful advice with bonus. How-ever, both average bonus, and the number of bonus-payers decrease over time.*
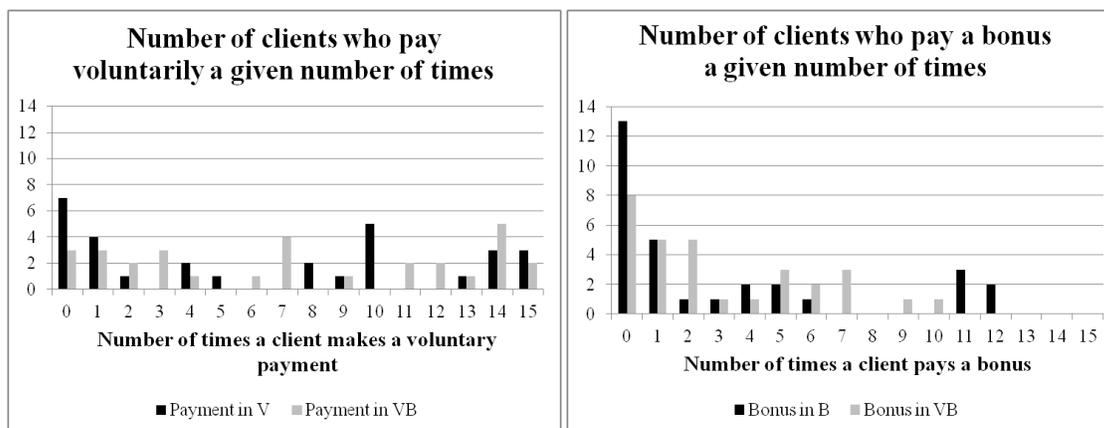
4.5   Individual behavior

Figure 6: How many times does a client pay?

Figure 6 depicts the individual heterogeneity in the behavior of clients. On the left hand-side, we consider voluntary payments and on the right hand-side – bonuses paid. 23 clients (77%) in V and as much 27 clients (90%) in VB do offer an upfront voluntary payment at least once. Moreover, 15 clients (50%) in V and 13 clients (43%) in VB offer an upfront payment more than half of the time (i.e. in at least 8 out of 15 rounds). Apparently, the phenomenon of offering a voluntary upfront payment is not due to a small number of subjects. Bonuses are also paid, although they are less common than upfront payments. Still, 17 clients (57%) in B and 22 clients (73%) in VB pay a bonus at least once.

We classify advisors' decisions in three categories: lie, conditional lie, and truth. To this end, we look at the recommendations for payments 0 and 2 given by the same advisor. If the recommendation is truthful for both payment sizes, then it is classified as "truth". If the recommendation depends on the size of the payment,

Type of recommendation	O	V	VB
Lie (in %)	55	58	43
Conditional lie (in %)	40	34	48
Truth (in %)	5	8	8

Table 10: Classification of decisions in O, V, and VB (N=450)

such that it is truthful for 2 and not truthful for 0, then it classifies as a "conditional lie". All remaining recommendations are classified as a "lie". We add up recommendations from all rounds, so that the total number of recommendations is 450 in each treatment. The underlying assumption for this categorization is, of course, that advisors believe that clients will follow advice when clients paid for it and will not follow advice when they did not pay for it. Table 10 reports the results. We believe that the "Conditional lie"– category (to which 1/3 to 1/2 of recommendations belong) would be part of the "Lie"– category without the possibility for clients to offer a voluntary payment and/or bonus.

4.6   Profits

Actual profits of clients and advisors are noisy since they do not only depend on actual behavior but also on chance. Recall that, if clients decide not to follow advice, a random device selects for them among the not recommended options. To be able to reasonably compare profits across the different upfront payments and treatments, we computed profits given the actual behavior of advisors under the assumption that clients always follow advice. The results of this simulation are depicted in Figure 7.

The highest (second-highest) profit for clients is achieved for payment 2 (0) in O, for payment 0 (2) in V, and for payment 2 (1.5) in VB. Hence, in O and V it is best for clients to either offer the highest payment or to not pay at all. In VB clients fare best when they offer the two highest amounts of payment. The highest
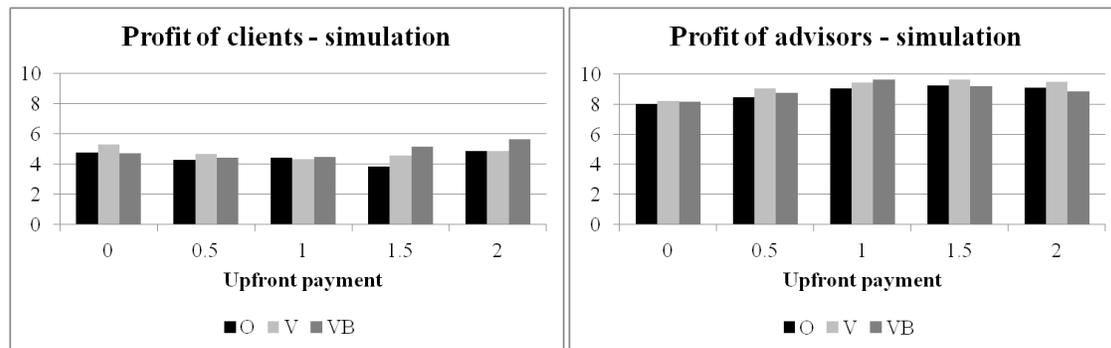
Figure 7: Average profits of clients and advisors given actual advice and assuming that clients always follow advice

average profit for clients (across all amounts of upfront payments) could be achieved in treatment VB (4.9) followed by V (4.7) and O (4.4).

The highest (second-highest) profit for advisors is given for payment 1.5 (2) in O and V, and for payment 1 (1.5) in VB. This is not very surprising: in O and V a sufficient number of advisors take the relative high payments of 1.5 and 2 without providing truthful advice, which increases the average payoff. In treatment VB, truth-telling at payment 2 is very high, that is why payoffs for advisors there cannot be maximized. Obviously, this is not the case for (the still high enough) payments 1 and 1.5, where truth-telling is less common. On average, advisors fare best in V (9.15), followed by VB (8.89) and O (8.76).

5   Discussion of results

Experimental tests (see, for instance, Cai and Wang, 2006; Sánchez-Pagés and Vorsatz, 2007) of strategic information transmission consistently report more truth telling than predicted by standard Bayesian Nash equilibrium analysis.

Our experimental results confirm this general finding of overcommunication. In addition, our design allows us to discuss various social preferences models that are candidates to explain overcommunication tendencies. In this section we first summarize findings of previous studies, then derive equilibrium predictions for our game, and finally discuss explanations proposed by previous studies in the light of our data.

Gneezy (2005) finds that the extent of lying is sensitive to the potential gains of the sender and the potential losses of the receiver. He relates motivations to (not) lie to belief-dependent models of let down or *guilt aversion*, see Battigalli and Dufwenberg (2009) for a formal framework. *Cost of lying* models, see, for instance, Ellingsen and Johannesson (2004), Chen et al. (2008), and Kartik (2009), typically assume that a cost, say k, is associated with the plain act of lying, that k increases with the magnitude of the lie, and that k is belief-independent. Hurkens and Kartik (2009) propose that Gneezy's (2005) data is also consistent with the hypothesis that people would either never lie, or always lie if the outcome obtained by lying exceeds the one obtained by not lying, i.e., lying aversion is constant and neither increasing in own gains nor decreasing in other's losses. Erat and Gneezy (2011) vary the payoffs of the sender-receiver game to explain the interaction between lying aversion and *distributional concerns*. They show that generally, lying is sensitive to incentives, but aversion to lying cannot be explained only with the negative consequences to others. Namely, a Pareto improving allocation that can only be achieved with a lie is attractive, but still a considerable number of people are reluctant to lie.

5.1   Theoretical benchmark

For the game theoretical analysis, the ex-ante and ex-post payments are irrelevant, such that the outcome of the game with payments does not differ from the outcome

of the game without payments.

The advisor observes what table has been randomly drawn and chooses whether to recommend the best option for the client (10 tokens), the medium (5 tokens) or one of the worst (2 tokens). The client expects that the advisor will recommend the best option with probability p, the medium option with probability q, and one of the worst options with probability $1 - p - q$. The client's expected payoff from following and not following, respectively, equals:

$$\text{Follow: } 10p + 5q + 2(1 - p - q) = 8p + 3q + 2$$

$$\text{Not follow: } 3p + 14/3q + 17/3(1 - p - q) = 17/3 - q - 8/3p$$

The client follows the advice if her expected payoff from following exceeds her expected payoff from not following, formally, if:

$$32p + 12q > 11$$

Among all p and q that satisfy this inequality, the advisor chooses those that maximize her payoff, that is $p = 0$, and $q = 1$.

Hence, in equilibrium, the advisor recommends the medium option for the client with certainty; the client is sure that the medium option has been recommended; and the client follows the advice. The resulting payoffs are 10 for the advisor and 5 for the client.

In our data we do observe high frequencies of the equilibrium outcome. However, outcomes (Medium, Not Follow) and (Best, Follow) are quite frequent without qual-

ifying as equilibria. While the reason for the former can be mis-coordination, the reason for the latter may be inequity aversion, guilt aversion, or lying aversion.

5.2 Inequity aversion

One can argue that the upfront payments change the initial structure of the game, such that payoffs from the different options become

Option	Payoff advisor	Payoff client
Best (for client)	$5 + x$	$10 - x$
Medium (for client)	$10 + x$	$5 - x$
Worst (for client)	$5 + x$	$2 - x$

Table 11: Payoff reallocation given upfront payments

with $x \in \{0, 0.5, 1, 1.5, 2\}$ being the upfront payment. The larger the voluntary payment x, the more equal become payoffs given by option Best. This means that for inequity averse advisors option Best may become attractive for certain values of x. This would explain why advisors recommend Best. For the following preferences à la Fehr and Schmidt (1999) one can calculate for which values of x option Best will be preferred to option Medium.

$$U_{AD} = \left\{ \begin{array}{l} \pi_{AD} - \beta_{AD}(\pi_{AD} - \pi_{CL}) \text{ if } \pi_{AD} > \pi_{CL} \\ \pi_{AD} - \alpha_{AD}(\pi_{CL} - \pi_{AD}) \text{ if } \pi_{AD} \leq \pi_{CL} \end{array} \right\} \tag{1}$$

with $0 \leq \beta_{AD} < 1$, $\alpha_{AD} \geq \beta_{AD}$, AD being the advisor, and CL being the client.

It turns out that only for upfront payments of $x \in \{1.5, 2\}$ inequity averse individuals would prefer option Best to option Medium, such that the conditions for the parameters α and β are satisfied. This finding is consistent with the behavior of advisors in treatment V, where indeed only voluntary payments of 1.5 and 2

achieve significantly higher frequencies of option Best recommendations. However, in treatments O and VB, the voluntary payment of 1 already induces advisors to recommend option Best significantly more often. Inequity aversion cannot explain the higher frequency of truthful advice given payment of 1 in treatments O and VB.

5.3 Guilt aversion

Following Battigalli and Dufwenberg (2009), guilt aversion would predict the following in our game. Let α be client CL's belief about the probability that advisor AD gives truthful advice. Then β denotes AD's belief regarding α. In order to measure the amount AD thinks she hurts CL by not giving truthful advice, we calculate the difference between CL's payoff when AD gives truthful advice and when she does not, and weight it by the second-order belief β: $(10 - 5) \cdot \beta = 5 \cdot \beta$.

How much this actually affects AD is expressed by taking her sensitivity to guilt γ_{AD} into account. Hence, if AD decides to give untruthful advice, she experiences guilt of $5 \cdot \gamma_{AD} \cdot \beta$. This psychological cost of guilt reduces AD's material payoff of choosing to give untruthful advice. Given AD is rational, she will prefer to give truthful advice, if the following inequity holds:

$$U_{AD}^{LIE} = 10 + x - 5 \cdot \gamma_{AD} \cdot \beta \quad < \quad 5 + x = U_{AD}^{TRUTH} \tag{2}$$

Note that $\gamma_{AD} = 0$ represents the case of pure self-interest. It follows that the voluntary payment x does not have a direct effect on the decision of AD. However, it should have a positive effect on β. The more CL pays to AD upfront, the more CL should expect to get truthful advice. In fact, for $x = 2$, α must be at least $2/(10 - 5) = .4$, otherwise a rational CL would not make such a payment. This suggests that, on average, the rate of truthful advice should increase with the voluntary

payment made by the client.

Our results from treatments V and VB are in line with this. When a voluntary payment is possible, the rate of truthful advice is monotonously increasing with the size of the payment. For low payments ($x \leq 1$ in V and $x \leq 0.5$ in VB) the rate of truthful advice is not statistically different, though. Only for $x > 1$ the rate increases with the amount paid upfront. It seems that the voluntary payment must be 'large enough' in order to have an effect on the second-order beliefs of AD, and in turn on AD's decision.

5.4 Lying aversion

We do find a substantial 'baseline' amount of truth-telling, when the client makes an upfront payment of $x = 0$. This behavior is in line with a constant cost of lying that would make some people tell the truth 'no matter what', but difficult to explain with other social preferences models.

While the upfront payment changes the payoffs of client and advisor, it does not affect the size of the lie (at least not directly, possibly however in the perception of subjects, which we cannot entirely rule out). Hence, independently of x, the size of the lie is always $10 - 5 = 5$.[20] Given the constant size of the lie and the increasing rate of truth-telling for increasing x, lying aversion cannot explain our results.

Since in our study the rate of lying decreases with the upfront payment increasing, our data is at odds with the claim that people either never lie or always do, if the outcome from lying is more beneficial to them than the outcome from not lying

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[20]Note, however, that x may affect the belief about the descriptive norm that should be followed in a given context, which in turn may affect lying aversion, as suggested by Erat and Gneezy, 2011.

(Hurkens and Kartik 2009).[21]

6 Conclusions

Our study extends a standard sender-receiver game with conflicting preferences with a preceding and/or a concluding action by the receiver. More specifically, the receiver can try to influence information transmission by offering a (voluntary) payment before the sender sends the message (two-stage design), or in another treatment, a combination of a voluntary upfront payment and a bonus after feedback on the quality of the message (three-stage design). The motivation to employ voluntary components to improve information transmission comes from laboratory and field experiments on gift exchange. Our results indicate that clients (receivers) are frequently willing to pay voluntarily for advice. This tendency is stable over time in the treatment with mutual opportunities to reciprocate. In turn, advisors (senders) readily reward positive upfront payments with truthful advice, with the three-stage design being most successful in inducing truthful advice across treatments. Within treatments, the higher payments lead to more truthful advice than the lower payments. While evidence on the stability of advisor's behavior over time in treatments with a two-stage design is mixed, the frequency of truthful advice is stable over time in the three-stage design treatment. Clients follow advice if they pay for it, especially if the payment is voluntary and generous.

As illustrated in section 2, the misaligned interests in markets for financial advice, and their negative consequences for market efficiency, are on the top of the agenda

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[21]With or without upfront payment, it is always best for the advisor, if outcome (Medium, Follow) is implemented. If advisors believe that clients are sufficiently likely to follow the advice, then the frequency of Best should be the same independently from the amount paid upfront.

of several regulation authorities. What could be effective instruments to reduce the conflict of interest? One possible measure is to require advisors to disclose commissions in order to make the conflict of interest more transparent. However, mandatory disclosure of commissions may have drawbacks. It may prevent consumers to correctly evaluate relevant product facts due to information overload (Lacko and Pappalardo, 2004) and it may result in reduced quality of advice as disclosed commissions may be perceived by advisors as a justification for deviating from professional standards (Cain et al., 2005). Inderst and Ottaviani (2011) conclude that the required disclosure of commissions may have ambiguous welfare implications even in the long run. Dulleck et al. (2011) experimentally analyze credence goods and find liability to be the only effective instrument (the others being verifiability, reputation and competition) to avoid inefficiencies in markets for credence goods. While financial advisors are liable for blatantly wrong advice, it seems difficult to imagine that advisors can be made liable for the kind of biased, but not totally wrong advice that is the main problem in markets for retail financial products.

The results of our study indicate that voluntary components could be a promising alternative instrument to reduce moral hazard. We find that the rate of truthful advice increases with the opportunities to reciprocate, and with the size of the voluntary payment. In the treatment with the most opportunities to reciprocate (an upfront payment and bonus afterwards) voluntary payments/share of truthful advice/share of clients following do not decrease over time, despite the lack of reputation.

During the public debate in recent years the financial industry voiced concerns, whether customers would accept fee-based advice. According to recent surveys[22], clients are not willing to pay (enough) for financial advice. Our experiment shows that clients readily offer voluntary payments upfront: 77% of clients in one of the

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[22]See, e.g., Drost et al., 2011.

treatments, and as much 90% in the other pay voluntarily upfront at least once, and half of the clients offer a payment in at least half of the rounds. It seems that voluntary components may indeed be a suitable instrument to increase the rate of truthful advice and alleviate moral hazard in the market for financial advice.

Two examples from the German financial industry round off our paper. The Quirin Bank, that started business in 2006, completely relies on fee-based advice. The investment counsel Deutsche Honorarberatung leaves it up to clients to choose the size of the fee. On their web site they state "out of experience we know that our clients appreciate our services and are willing to honor them. That's why after each consultation you decide, how much our services are worth to you – and this is what you pay. We do, however, reserve the right to terminate working with a client. This way not only our services but also our business model is completely aligned with your interests."

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7 Appendix

Experimental Instructions for treatment VB

Remark: this is a translation from German. Instructions for treatments V, O, and B, are a subset of these instructions and available from the authors upon request.

Welcome and thank you for participating in this experiment! In this experiment you can earn money. The amount of money you can earn depends on your decisions and those of the other participants. **Therefore, it is very important that you read the following instructions very carefully.**

During the entire experiment it is not allowed to talk to other participants. If you have any questions, please raise your hand. We will answer your questions in private. Please do not ask your question(s) aloud. Should you not follow these rules, we will have to cancel the experiment. Please turn off your mobile phones now.

General Procedure

The experiment takes about 75 minutes. The decision tasks will also be explained to you briefly on your screens. While you are making a decision, simultaneously other participants will also be making decisions, which may generate payoffs for you.

During the experiment you can earn money. Your payoff will be calculated in ECU (Experimental Currency Units) and converted into EURO at the following exchange rate:

1 ECU = 0.50 EURO.

In this experiment, 2 out of 15 rounds will be randomly selected. You will be paid according to your earnings in these specific rounds, in cash, at the end of today's session. Additionally, you will receive a show-up fee of 2.50 euro.

Here is an overview of the session:

1. Reading the instructions, answering test questions (online)

2. Decision tasks (15 rounds)

3. Questionnaire

4. Payoff and end of the experiment

Details of the experiment

This experiment consists of 15 rounds. In each round two participants will interact with each other: **one advisor and one client**. At the beginning of the experiment

you will learn which role was randomly assigned to you. In each round a new participant will **randomly and anonymously** be assigned to you. None of you will be able to find out the identity of the other.

Decision situation in each round

In each round, both advisor and client, will receive an initial endowment of 2.50 ECU.

In each round, there will be four payoff pairs to choose from. In each pair, the first number stands for the payoff of the advisor, and the second – for the payoff of the client (in ECU).

<div align="center">

(Payoff advisor, Payoff client)

(10, 5) ; (5, 10) ; (5, 2) ; (5, 2)

</div>

In each round, a name will be assigned to each pair. In total, there are four possible names: Option A, Option B, Option C, and Option D. **The allocation of payoff pairs to names will be randomly determined in each round**. I.e., the payoff pair (10, 5) will sometimes be called option A, sometimes option B, sometimes option C, and sometimes option D. Hence, the best option for, e.g., the advisor will sometimes be A, sometimes B, sometimes C, and sometimes D.

In each round, only the advisor will learn which option was assigned to which payoff pair. E. g., in one round, the advisor will see the table on the left (s. below), and in another round – the table on the right. Consequently, Option B will be the most profitable one for the client in the former round, and option D in the latter.

Option	Payoff advisor	Payoff client
A	10	5
B	5	10
C	5	2
D	5	2

Option	Payoff advisor	Payoff client
A	5	2
B	5	2
C	10	5
D	5	10

The advisor has to recommend one of the options to the client. This recommendation will be the only information the client will receive about the different options. There are four possible recommendations:

- With option A you will earn more than with the other three options.

- With option B you will earn more than with the other three options.

- With option C you will earn more than with the other three options.

- With option D you will earn more than with the other three options.

The client will not see the recommendation of the advisor. She will only decide whether to follow the recommendation or not. If yes, the recommendation will automatically be implemented as her decision. If not, the computer will randomly select one of the three not recommended options. The selected option will determine the payoffs for advisor and client.

Course of events in each round (further information will follow below)

1. The client decides how much she is willing to voluntarily pay to the advisor for the recommendation.

2. The advisor decides which option to recommend.

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3. The client decides whether follow the recommendation or not.

4. The client learns her payoff and decides what bonus she will pay to the advisor.

Voluntary Payment

Before the advisor gives her recommendation, the client will decide whether to offer a voluntary payment between 0 and 2 ECU (in steps of 0.5 ECU) for the recommendation. The selected amount will then be deducted from the client's initial endowment (2.50 ECU) and paid to the advisor. The advisor is obliged, however, to give a recommendation independent of whether the client offers her a payment or not. Since the advisor will first not learn whether she was offered a payment or not, the advisor will have to give a recommendation for each possible payment of 0, 0.5, 1, 1.5, 2 ECU. The recommendation corresponding to the client's actual voluntary payment will be sent to the client.

Bonus

In each round, after the client learns about her earnings, she will decide how much bonus to pay to the advisor. The bonus can be any amount between 0 and the client's earnings of this particular round (initial endowment minus the possible voluntary payment plus the payoff from the selected option). The bonus will then be deducted from the client's earnings and added to the advisor's earnings.

Payoff (2 of 15 rounds)

Your payoff for each round will be calculated as explained above. Client and advisor will receive their payoffs according to the realized payoff table. The advisor will

possibly receive a voluntary payment and a bonus, which will, in turn, be deducted from the client's earnings.

Your final payoff from the entire experiment will only be determined by your earnings in 2 out of the 15 rounds. These two rounds will be randomly determined at the end of the experiment. You will be paid in cash after you completed the final questionnaire.