

Lying, Guilt, and Shame

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Abstract

An aversion to lying appears to be present in a number of economic contexts, both in the field and the laboratory. This paper tests a model in which preferences for truth-telling arise as a result of shame aversion and guilt aversion. Individuals experience shame if they are perceived by others as dishonest, even when they have only one anonymous interaction. Guilt is based on the desire to avoid taking actions that let down another person's expectations about payoffs. Our experimental test of the model shows that while guilt is a modest motivator for truth-telling, avoiding shame is important. The results generally show that preferences for truth-telling cannot be fully explained by models focused on outcomes or by models using fixed lying costs. Rather, psychological game theory provides fruitful avenues for modeling the decision to lie.

Keywords: Shame, guilt, deception, psychological game theory, experimental economics

1 Introduction

What motivates people to communicate truthfully when it is in their monetary self-interest to lie? This paper tests a model in which agents experience disutility from lying because of guilt and shame.

Lewis (1971) and Tadelis (2011) discuss two important distinctions between guilt and shame. First, while guilt results from an impersonal social norm internalized by the individual, shame is derived from a human “other” who judges the behavior to be inappropriate. Second, guilt is related to a specific action, yet shame is a more general feeling involving one’s whole self-image. In economics, guilt is modeled as a desire not to let down someone else in terms of monetary payoffs (Battigalli and Dufwenberg, 2007; Battigalli, Charness, and Dufwenberg, 2013).¹ Shame is modeled as a desire to be perceived favorably by others (Battigalli and Dufwenberg, 2009; Tadelis, 2011). Thus, guilt depends on monetary outcomes, but shame does not.

Consider an example in which someone is trying to sell a second-hand product over the internet. This individual has an incentive to inflate the quality or condition of the product to obtain a higher price for this good. However, even in the absence of reputational concerns, many sellers might choose to tell the truth about the quality of the product. The seller might not want to disappoint the buyer with a product that is worse than expected (guilt) and lying itself could result in the seller being perceived as dishonest if detected (shame). Moreover, since theories of guilt and shame aversion are belief-dependent, it is challenging to ensure proper controls in the field. A laboratory experiment to isolate the effects of guilt and shame aversion is therefore essential.

¹ Guilt aversion has gained a great deal of attention in the literature (see, for example, Bellemare, Sebald, and Suetens, 2014; Charness and Dufwenberg, 2006; Dufwenberg and Gneezy, 2000; Ederer and Stremitzer, 2013; Ellingsen et al., 2010; Kawagoe and Narita, 2014; Khalmetski, Ockenfels, and Werner, 2013; Peeters, Vorsatz, and Walzl, 2012; Vanberg, 2008).

We test a model of guilt and shame with a cheap-talk sender-receiver game in which the sender accurately or inaccurately reports the state of the world (a six-sided die roll) to the receiver (Erat and Gneezy, 2012). In our basic game, the sender decides which message to send in two payoff scenarios. Importantly, the sender has private information about the payoff possibilities in the game and has an opportunity to increase her own monetary expected payoff by lying. The receiver observes only one message (in the relevant payoff case) from the sender regarding the die roll number, but not the actual die roll itself. Hence, the receiver cannot detect whether the sender lies. If the receiver chooses the correct outcome of the die roll, both players earn equal payoffs; if she chooses the wrong outcome, the payoff of the sender increases at the expense of the receiver's payoff.

Our experiment separates the effects of shame and guilt. To test for guilt aversion, we exogenously induce the second-order beliefs of senders about the monetary expectations of the receivers. Senders makes two choices. In one of the choices, senders can monetarily disappoint the receiver by lying; in the other choice their lies would not lead to disappointment for the receiver.

To test for the role of shame, our experiment introduces a treatment in which a sender knows that the receiver will be informed about the actual outcome of the die roll *after all decisions have been made*. The receiver can thus detect whether the sender lied to her, which could evoke shame for a sender who lies. Thus, our experimental design distinguishes between four settings: (1) only guilt can be present, (2) only shame can be present, (3) both shame and guilt can be present, and (4) neither shame nor guilt can be present.

We find that senders send the true message about twice as often in the treatment in which receivers can detect whether the senders lied compared to the treatment in which they cannot. This finding is consistent with shame aversion and cannot be explained by guilt

aversion. Recall that senders make two choices: one in which guilt can arise and one in which it cannot. In both cases, shame increases truth-telling, which shows that the effects of shame aversion do not depend on the presence or absence of guilt aversion. Our results also show that shame increases truth-telling in an anonymous setting in which identities are never revealed, indicating that image-motivation plays a role even when reputational concerns are absent.

Guilt aversion finds limited support both in settings in which senders can feel guilt only and those in which they can experience a combination of shame and guilt. Senders tell the truth slightly more frequently in the choices in which lying can result in disappointment for the receiver, but the effect is at best marginally significant.

Our paper fits into several streams of literature. The research most closely related to the current paper is Tadelis (2011), which reports on shame motivation in a noisy trust game experiment. In his study, either participants directly observe that the other player's action caused their (bad) outcomes, or they know that chance might have caused their outcomes. Consistent with shame, he finds more trustworthy behavior when the other player can infer the actions with certainty rather than with noise.

Our paper differs from Tadelis (2011) in three important ways. First, we use a between-subject design rather than a within-subject design to identify shame aversion. Second, our paper investigates lying behavior rather than reciprocity and trustworthiness. Third, we explicitly distinguish between situations in which only shame is present, only guilt is present, both are present, or neither is present. We find that the effect of shame is robust to the presence (or absence) of guilt.

Furthermore, our results on shame aversion show that revealing whether a lie has been told increases truth-telling even when all participants remain anonymous. Previous studies

have focused on the effects of social image by revealing the identities of participants (e.g., Andreoni and Bernheim, 2009; Ariely, Bracha, and Meier, 2009).² They find that individuals behave more prosocially when their actions are public. Our anonymous experiment shows that shame has important effects on decisions to tell the truth that go beyond public appearance. As noted by Lewis (1971, p. 39), “shame may be experienced in private or it may be evoked by an actual encounter with a specific or ill-defined ‘other’.”

Our test of guilt aversion differs from that of previous studies. Dufwenberg and Gneezy (2000) show that higher second-order beliefs about the monetary expectations of the counterparty correspond with more generous behavior. This finding is consistent with guilt aversion, but also with the false consensus effect (i.e., others may behave similarly to oneself). Ellingsen et al. (2010) rule out the false consensus effect by communicating monetary expectations of the second mover to the first mover (which could lead to exaggerated expectations) and find no evidence for guilt aversion. Our study rules out both the false consensus effect and incentives to exaggerate by inducing (rather than eliciting) second-order beliefs exogenously and communicating the same information to both players.

Our findings also fit into the broader literature on psychological motivations for truth-telling. There is strong evidence that many people reveal a preference for truth-telling at the expense of their own monetary payoffs (Fischbacher and Heusi, 2013; Gibson, Tanner, and Wagner, 2013; Gneezy, 2005; Mazar, Amir, and Ariely, 2008). Several studies explain lying aversion through explicit lying costs (Kartik, 2009; López-Pérez and Spiegelman, 2013). We find that even when guilt and shame motives are absent, about 20% of experimental subjects send a costly honest message. This evidence is consistent not only with lying costs, but also

² Other relevant papers on image motivation and social pressure include Bateson, Nettle, and Roberts, 2006; Bénabou and Tirole, 2006; Cappelen et al., 2013; Dana, Weber, and Kuang, 2007; DellaVigna, List, and Malmendier, 2012; Ellingsen and Johannesson, 2008; Glazer and Konrad, 1996; Hao and Houser, 2011; and Jiang, 2013.

with outcome-based fairness. That is, individuals might tell the truth even in settings in which guilt and shame motivations are absent simply because they are generally averse to lying or because they care about receivers' payoffs. However, lying costs or outcome-based models cannot explain our evidence of shame aversion. This illustrates that psychological game theory is a fruitful way to further explore preferences for truthful communication.

2 Experiment

2.1 The modified deception game

To test for the influence of guilt and shame on truth-telling, we use a modified version of the cheap-talk sender-receiver game (similar to Gneezy, 2005; Erat and Gneezy, 2012). At the beginning of the experiment, each subject is randomly assigned one of two roles: "sender" or "receiver." The sender and receiver play an anonymous one-shot game.

Before the start of the game, we communicate the outcome of a six-sided die roll to the sender, but not to the receiver. Then, we ask the sender to communicate two messages to the receiver. The six possible messages are: "The outcome from the roll of the die is i ," where $i \in \{1,2,3,4,5,6\}$. The sender is free to send two identical or two different messages and can send the true number to the receiver or a wrong number. Appendix C1 shows a screenshot of the choices faced by the sender.

We introduce two sets of payoff stakes, which can occur with equal probability. We tell senders that both players are paid according to payoff Options A^H and B^H if nature decided on the "High" stakes state, or they are paid according to payoff Options A^L and B^L if nature decided on the "Low" stakes state, each of which can happen with 50% probability. Table 1 summarizes these possible payoffs.

Because the sender does not know *ex ante* which state will be realized, she chooses a message for each state using the strategy method (Selten, 1967). Then nature draws one of the stakes states with 50% probability each and the receiver gets the message chosen by the sender for the relevant stakes state.

Table 1 – Payoff Matrix for Modified Deception Game

	Option A		Option B	
	<i>Payoff Sender</i>	<i>Payoff Receiver</i>	<i>Payoff Sender</i>	<i>Payoff Receiver</i>
High	15	15	20	10
Low	10	10	15	5

Notes: Senders in a cheap-talk sender-receiver game choose messages to send to receivers based on two payoff possibilities (High and Low), each of which occurs with probability 50%. Receivers, who have no knowledge of the payoff possibilities, make a choice based on the message they receive. Receivers' choices dictate whether both players are paid according to Option A or Option B.

Only the sender knows that there are two sets of payment options. Moreover, the sender is informed that only the one relevant message that is selected by nature with 50% probability will reach the receiver. It is important to note that even though the sender makes two decisions, only one will be implemented. In fact, the receiver does not know that the sender is making multiple choices using the strategy method.

After the sender has made her choices, the one message that is randomly determined to become payoff-relevant, is observed by the receiver. The receiver is asked to choose a number between 1 and 6. If the receiver chooses the actual outcome of the die roll, payoff Option A will be implemented and otherwise payoff Option B will be implemented, i.e., in case of the High stakes state either payoff Option A^H or B^H will be implemented while in

case of the Low stakes state either the payoff Option A^L or B^L will be implemented. Only the sender knows the payoffs associated with each option, and this is common knowledge.

We inform the sender that the only information the receiver has about the actual outcome of the die roll is the message she receives from the sender. We also tell each sender that the payoffs of the game are determined entirely by the receiver's choice.

2.2 Identifying guilt

Guilt depends critically on senders' second-order beliefs about the receivers' expectations of their earnings in the game. In the *Guilt treatment* and *Guilt and Shame treatment*, we induce these second-order beliefs of senders exogenously by informing both senders and receivers about the average payoff of receivers in previous sessions of the exact same experiment. The amount we communicate is the only source of information subjects get about the payoff receivers can expect in the game. We induce these second-order beliefs of senders by informing both senders and receivers that receivers in a similar previous experiment earned, on average, approximately €10. This induces the first-order beliefs of receivers and the second-order beliefs of senders.

Inducing the expected payoff of the receivers and the second-order beliefs of the senders allows us to test for guilt aversion.³ With an expected payoff of €10 in the *Guilt* and in the *Guilt and Shame treatments*, receivers can only have disappointment in the Low choice. If the sender lies in the Low choice, the receiver ends up with €5, which is less than the €10 expected by the receiver. In the High choice, the lowest payoff the receiver can earn is €10, which is the amount the receiver expects. Thus, the difference between the choices

³ The actual earnings for receivers in the *Control* were €9.1, which is €10 when rounded up to a whole euro.

made by the sender in the High and Low choices tells us the extent to which she has guilt aversion.

Our test of guilt aversion is unaffected by potential differences in beliefs about following rates. Recall that a sender makes two choices (High and Low) of which only one is transmitted to the sender with a 50% probability each. For both choices, the sender is matched to the same receiver. We identify guilt by the difference in truthful message between the High and Low choice. Senders' beliefs about receivers' actions should be equal for both these choices given that receivers only observe one message and are unaware that the sender is facing two choices.

The experimental design in this paper eliminates concerns about the false consensus effect, whereby agents' elicited beliefs are biased by how they believe they would behave if in the opponents' role (Bellemare, Sebald, and Strobel, 2011; Ross, Greene, and House, 1977). Previous studies showing support for guilt aversion found a positive correlation between second-order beliefs of senders and their actions (Charness and Dufwenberg, 2006; Dufwenberg and Gneezy, 2000; Peeters, Vorsatz, and Walzl, 2012). Because we induce beliefs about monetary expectations of receivers rather than elicit them, our design is immune to the false consensus effect.

Furthermore, in our study, receivers cannot strategically influence senders' actions. Other studies, such as Ellingsen et al. (2010) and Kawagoe and Narita (2014), elicit second-order beliefs by asking recipients in a dictator game and trustees in a trust game about their expectations of dictators and trustors, respectively. They then communicate these beliefs to the dictators or trustors and find no correlation between these communicated second-order beliefs and the actions of dictators and trustors, concluding that the evidence for guilt aversion is weak.

2.3 Identifying shame

In the *Guilt and Shame treatment*, we inform all players in the beginning of the experiment that after all choices will have been made, receivers will learn the actual outcome of the die roll. In essence, whether the sender lies or tells the truth is revealed, but only after the outcome of the game has been determined. Thus, differences between senders' behavior in the *Guilt and Shame* and in the *Guilt treatment* allow us to test for the effect of shame.

2.4 Belief elicitation

For both treatments as well as for the *Control*, we elicited senders' beliefs about whether the receivers follow their messages. This allows us to test whether differences we find in the choices made by senders across treatments are due to guilt and shame or to changes in beliefs about whether their messages will be followed. After all choices by all participants are made, we ask senders to indicate how many receivers in their session decided to follow their senders' message. If the sender correctly guesses the number, she receives an additional €2. If her guess deviates from the actual number by 1, she receives €1 in addition; larger deviations are not rewarded.

2.5 Procedure

All sessions were run at the University of Cologne in June 2013 with z-Tree (Fischbacher, 2007). Senders and receivers were paired anonymously and seated in separate rooms.⁴ We recruited 234 student participants from a large subject pool. Subjects were on average 24

⁴ See Appendix C2 for an English translation of the instructions.

years old and 59% were female. Subjects earned on average €12.74 (approximately \$16.68 given conversion rates at the time of the experiment) including earnings from the belief elicitation task. There was no show-up fee. The experiment took about 45 minutes.

3 Theoretical Predictions

We propose a model that combines guilt and shame aversion. Individuals feel guilty if they disappoint others in their monetary expectations. In contrast to guilt, shame is independent of the monetary outcome of the other player. Instead, shame motivates an individual to tell the truth to avoid being perceived as a liar.

The introduction of shame represents a departure from existing frameworks of lying aversion in two important ways. First, the sender incurs a greater cost when the chances she will be “caught” are large. So this formulation differs from a lying-costs framework in the sense that the sender is not lying averse per se, but averse to being perceived as a liar. Second, lying aversion, in our paper, depends on communication itself (i.e., the message sent to the receiver). The material payoffs of the game remain independent of communication. We present our shame hypothesis, which follows from Theorem 1 in Appendix A.

Hypothesis 1 (Shame): Senders are more likely to tell the truth when they know receivers will be able to detect whether they told the truth after all choices have been made and payoffs are determined.

We extend the model slightly to include both shame and guilt. Refer to Battigalli, Dufwenberg, and Charness (2013) and Appendix A for the details. Hypothesis 2 follows directly from their theoretical analysis.

Hypothesis 2 (Guilt): Senders are more likely to tell the truth when lying results in disappointment for the receiver.

The experiment presented is set up to identify shame in an environment in which guilt is ruled out as an alternative explanation (through the comparison of High choices in the *Guilt* and *Guilt and Shame* treatments). By the same token, to test for guilt, we can compare High and Low choices in an experimental treatment in which shame is present (*Guilt and Shame*) and one in which shame is absent (*Guilt*). Finally, we have a setting in which neither shame nor guilt is present (High choice in the *Guilt* treatment).

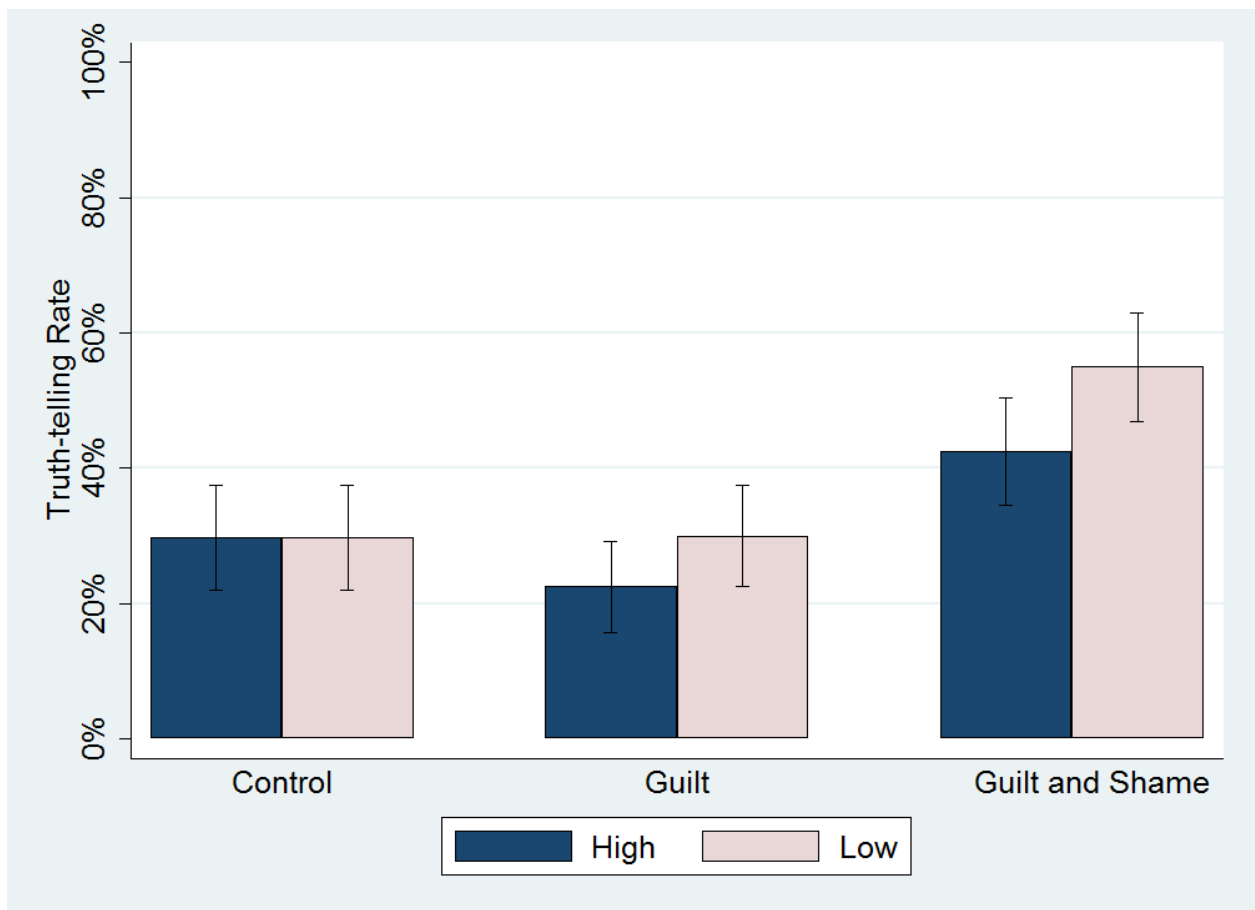
4 Results

4.1 Shame

Figure 1 summarizes our main findings. A tabular form can be found in Appendix B. Our model predicts that *ex post* revelation of the true outcome of the die roll to the receiver will lead to a higher frequency of truthful messages of the sender. By comparing differences in senders' truth-telling rates between the *Guilt treatment* and the *Guilt and Shame treatment*, we can identify the role of shame in lying aversion.

Recall that in the High choice, guilt cannot explain any differences in truth-telling. Thus, any effect of revealing the lie to the receiver can be attributed to shame alone. Remarkably, in the High choice, 42.5% of participants send a truthful message when the true outcome will be revealed while 22.5% of participants tell the truth when the outcome will not be revealed. This difference is statistically significant near the 5% level (Mann-Whitney test, $p=0.058$).

Figure 1 – Truth-telling Rates by Treatment



Notes: Senders in a cheap-talk sender-receiver game choose messages to send to receivers based on two payoff possibilities (High and Low), each of which occurs with probability 50%. This figure presents the proportion of senders who send the true message to the receiver for each payoff possibility with standard error bars, by treatment. In the *Guilt treatment* and in the *Guilt and Shame treatment*, we informed senders and receivers that receivers in a similar previous experiment earned on average €10. In the *Guilt and Shame treatment*, we informed all players in the beginning of the experiment that after all choices will have been made, receivers will learn the true state of the world, effectively revealing whether the sender lied or told the truth.

Next, consider the Low choice. Here, a lie can result in guilt for the sender depending on the sender's sensitivity to guilt. The results show that in the Low choice, 55% of participants send a truthful message if the outcome of the die roll will be revealed while 30% of participants send a truthful message when the outcome will not be revealed, which is statistically significant (Mann-Whitney test, $p=0.025$). This suggests that shame also plays a role in truth-telling when guilt is present.

Result 1: Shame significantly increases truthful communication.

4.2 Guilt

The Battigalli and Dufwenberg (2007) model of guilt aversion predicts that participants will be less truthful in the High choice than in the Low choice. The second set of bars in Figure 1 describes the results for the *Guilt treatment*. In line with the theory, we find that 22.5% of participants send a truthful message in the High choice, while 30% of participants send a truthful message in the Low choice. A Wilcoxon signed-rank test demonstrates that the difference is not statistically significant ($p=0.180$).

In the *Guilt and Shame treatment*, we also test for guilt. We find that 42.5% of participants send a truthful message in the High choice and 55% of participants send a truthful message in the Low choice (Wilcoxon signed-rank test, $p=0.096$). This evidence lends partial support to guilt aversion as an explanation for truth-telling. However, the fact that differences between High and Low choices are more pronounced in the *Guilt and Shame treatment* indicates that the shame effect positively interacts with a (potentially) small effect of guilt. It is plausible that guilt is more pronounced if the sender knows that the receiver will

both feel disappointed about her payoff and discover she has been lied to. In sum, we find modest support for Hypothesis 2.

Result 2: Guilt aversion has only a modest role in explaining preferences for truth-telling.

4.3 Alternative explanations

One alternative explanation for the effects of shame aversion is that differences in senders' truth-telling rates are due to differences in beliefs across treatments about whether the receivers will follow the message. Sutter (2009) demonstrates that individuals can also "lie" by telling the truth if they expect others not to follow their message. The higher truth-telling we observe in the *Guilt and Shame treatment* could be due to the fact that senders in this treatment believe that receivers are less likely to follow their messages compared to the *Guilt treatment*. However, the beliefs of senders are almost identical across the different treatments. A Kruskal-Wallis test confirms that there are no significant differences in beliefs between the *Control*, the *Guilt treatment*, and the *Guilt and Shame treatment* ($p=0.729$).⁵ Note that senders believe receivers will follow their messages 58%, 59% and 62% of the time in the in the *Control*, the *Guilt treatment* and the *Guilt and Shame treatment* respectively. Thus, our results on shame cannot be explained by differences in beliefs about following rates.

In the *Control*, when receivers' expectations are not induced, we find no difference between the High and the Low choices. In fact, the truth-telling rates were equal across the High and Low choices: 29% of participants send a truthful message for both the High and the

⁵ Binary comparisons of beliefs (using Mann-Whitney tests) between pairs of the three conditions yield similar results (each $p>0.49$).

Low choices. The fact that we find no difference between truth-telling rates in the High and Low choices in the *Control* shows that differences between the High and Low choices in the *Guilt treatments* are not simply due to the effect of the particular stakes used. In other words, if senders were less truthful in the High choice than in the Low choice simply because they had certain preferences over monetary outcomes, we would observe these differences in the *Control* as well. The modest support we find for guilt aversion is not driven by experimenter demand effects for similar reasons; if there were experimenter demand effects, we would expect to find differences in the High and Low choices in the *Control*, which we do not. Indeed, Brandts and Charness (2011) show that treatment effects that emerged from the strategy method also appear in direct-response methods.

5 Conclusion

This paper uses an experiment to isolate shame and guilt aversion as explanations for preferences for telling the truth. Shame depends on whether someone is perceived as a liar by others, while guilt can be evoked by taking an action that does not live up to another's expectations. There are many examples of the powerful effects of shame in relation to cheating. Loye Young, an adjunct professor at Texas A&M International University, publicly posted a list of students who had committed plagiarism in his course. Research Papers in Economics (RePEc) maintains a website in which it exposes acts of plagiarism in the field of economics. Diederik Stapel, a famous social psychologist in the Netherlands, was exposed as a fraud when his colleagues and students discovered he had spent his career fabricating data in many of his well-published journal articles, ultimately bringing him infamy in the international press. His academic dishonesty had profound effects on the scientific community, and more direct negative effects on his collaborators, many of whom were his

graduate students whose papers have now been debunked. In his autobiographic book, he admits that the worst part of the experience was the shame he felt for himself and his family (Stapel, 2012).

Guilt aversion has different consequences for preferences for truth-telling than shame aversion. Many universities try to curb cheating on exams by reminding students of a social norm. If students were driven by guilt aversion, stating a clear expectation could be effective in reducing the incidence of cheating. However, if students were driven by shame aversion they should react more strongly to potential threats to their social image.

In this paper, we use a laboratory experiment to isolate the effects of shame and guilt aversion in explaining preferences for truth-telling. Our experiment created four environments: (1) only guilt can be present, (2) only shame can be present, (3) both shame and guilt can be present, and (4) neither shame nor guilt can be present. We find strong effects of shame aversion and little evidence in support of guilt aversion as a driver for truthful communication.

It is important to note that the strength of shame and guilt aversion might depend on the specific situation. The effect of shame aversion could be stronger in the field, where people are not anonymous and have to live with their shame for more than the length of a short experiment. Most importantly, even when controlling for guilt aversion, we find that shame aversion has profound effects on promoting truthful communication. Furthermore, in line with other studies, we find limited support for guilt aversion (Ellingsen et al., 2010; Kawagoe and Narita, 2014; Vanberg, 2008). However, in cases in which disappointment to someone else is larger than in our experiment, the effect of guilt aversion might be larger (e.g., Bellemare, Sebald, and Suetens, 2013).

Previous research has found that people have a preference for keeping promises (e.g., Charness and Dufwenberg, 2006; Sánchez-Pagés and Vorsatz, 2007; Serra-Garcia, Van Damme, and Potters, 2013; Vanberg, 2008). We show that shame is a powerful cause of truth-telling even without an explicit promise. Future research could investigate whether feelings of shame and guilt are stronger if someone does not live up to a promise.

Our results show that preferences for truth-telling cannot be fully explained by outcome-based models. Rather, this paper highlights the importance of models of belief-dependent preferences. Our findings also suggest that moral appeals that affect emotions can be an effective way of reducing cheating. Low-cost communication on social media platforms is already widely used for shaming individuals who do “wrong.” Future research could investigate the impact of shame on lying in the field.

References

- Andreoni, James, and B. Douglas Bernheim. 2009. "Social Image and the 50–50 Norm: A Theoretical and Experimental Analysis of Audience Effects." *Econometrica*, 77(5): 1607-1636.
- Ariely, Dan, Anat Bracha, and Stephan Meier. 2009. "Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially." *American Economic Review*, 99(1): 544-55.
- Bateson, Melissa, Daniel Nettle, and Gilbert Roberts. 2006. "Cues of Being Watched Enhance Cooperation in a Real-world Setting." *Biology Letters*, 2(3): 412-414.
- Battigalli, Pierpaolo, Gary Charness, and Martin Dufwenberg. 2013. "Deception: The Role of Guilt." *Journal of Economic Behavior and Organization*, 93: 227-232.
- Battigalli, Pierpaolo, and Martin Dufwenberg. 2007. "Guilt in Games." *American Economic Review*, 97(2): 170-176.
- Battigalli, Pierpaolo, and Martin Dufwenberg. 2009. "Incorporating Belief-dependent Motivation in Games." *Mimeo*.
- Bellemare, Charles, Alexander Sebald, and Martin Strobel. 2011. "Measuring the Willingness to Pay to Avoid Guilt: Estimation using Equilibrium and Stated Belief Models." *Journal of Applied Econometrics*, 26(3): 437-453.
- Bellemare, Charles, Alexander Sebald, and Sigrid Suetens. 2014. "Heterogeneous Guilt Aversion and Incentive Effects." *Mimeo*.
- Bénabou, Roland, and Jean Tirole. 2006. "Incentives and Prosocial Behavior." *American Economic Review*, 96(5): 1652-1678.
- Brandts, Jordi, and Gary Charness. 2011. "The Strategy versus the Direct-response Method: A First Survey of Experimental Comparisons." *Experimental Economics*, 14(3): 375-398.
- Cappelen, Alexander W., Trond Halvorsen, Erik Ø. Sørensen, and Bertil Tungodden, 2013. "Face-saving or Fair-minded: What Motivates Moral Behavior?" *Mimeo*.
- Charness, Gary, and Martin Dufwenberg. 2006. "Promises and Partnership." *Econometrica*, 74(6): 1579-1601.
- Dana, Jason, Roberto A. Weber, and Jason Xi Kuang. 2007. "Exploiting Moral Wiggle Room: Experiments Demonstrating an Illusory Preference for Fairness." *Economic Theory*, 33(1): 67-80.
- DellaVigna, Stefano, John A. List, and Ulrike Malmendier. 2012. "Testing for Altruism and Social Pressure in Charitable Giving." *Quarterly Journal of Economics*, 127(1): 1-56.

- Dufwenberg, Martin, and Uri Gneezy. 2000. "Measuring Beliefs in an Experimental Lost Wallet Game." *Games and Economic Behavior*, 30: 163-182.
- Ederer, Florian, and Alexander Stremitzer. 2013. "Promises and Expectations." *Mimeo*.
- Ellingsen, Tore, and Magnus Johannesson, 2008, "Pride and Prejudice: The Human Side of Incentive Theory." *American Economic Review*, 98(3): 990-1008.
- Ellingsen, Tore, Magnus Johannesson, Sigve Tjøtta, and Gaute Torsvik. 2010. "Testing Guilt Aversion." *Games and Economic Behavior*, 68(1): 95-107.
- Erat, Sanjiv, and Uri Gneezy. 2012. "White Lies." *Management Science*, 58(4): 723-733.
- Fischbacher, Urs. 2007. "z-Tree: Zurich Toolbox for Ready-made Economic Experiments." *Experimental Economics*, 10(2): 171-178.
- Fischbacher, Urs, and Franziska Föllmi-Heusi. 2013. "Lies in Disguise—an Experimental Study on Cheating." *Journal of the European Economic Association*, 11(3): 525-547.
- Gibson, Rajna, Carmen Tanner, and Alexander F. Wagner. 2013. "Preferences for Truthfulness: Heterogeneity among and within Individuals." *American Economic Review*, 103(1): 532-548.
- Glazer, Amihai, and Kai A. Konrad. 1996. "A Signaling Explanation for Charity." *American Economic Review*, 86(4): 1019-1028.
- Gneezy, Uri. 2005. "Deception: The Role of Consequences." *American Economic Review*, 95(1): 384-394.
- Hao, Li, and Dan Houser. 2011. "Honest Lies." *Mimeo*.
- Jiang, Ting. 2013. "Cheating in Mind Games: The Subtlety of Rules Matters." *Journal of Economic Behavior and Organization*, 93, 328-336.
- Kartik, Navin. 2009. "Strategic Communication with Lying Costs." *Review of Economic Studies*, 76(4): 1359-1395.
- Kawagoe, Toshiji, and Yusuke Narita. 2014. "Guilt Aversion Revisited: An Experimental Test of a New Model." *Journal of Economic Behavior and Organization*, 102: 1-9.
- Khalmetski, Kiryl, Axel Ockenfels, and Peter Werner. 2013. "Surprising Gifts: Theory and Laboratory Evidence." *Mimeo*.
- Kőszegi, Botond. 2006. "Emotional Agency." *Quarterly Journal of Economics*, 121: 121-156.
- Kőszegi, Botond. 2010. "Utility from Anticipation and Personal Equilibrium." *Economic Theory*, 44: 415-444.

Lewis, Helen B. 1971. *Shame and Guilt in Neurosis*. New York: International Universities Press.

López-Pérez, Raúl, and Eli Spiegelman. 2013. "Why Do People Tell the Truth? Experimental Evidence for Pure Lie Aversion." *Experimental Economics*, 16(3): 233-247.

Mazar, Nina, On Amir, and Dan Ariely. 2008. "The Dishonesty of Honest People: A Theory of Self-concept Maintenance." *Journal of Marketing Research*, 45(6): 633-644.

Peeters, Ronald, Marc Vorsatz, and Markus Walzl. 2012. "Beliefs and Truth-telling: A Laboratory Experiment." *Mimeo*.

Ross, Lee, David Greene, and Pamela House. 1977. "The 'False Consensus Effect': An Egocentric Bias in Social Perception and Attribution Processes." *Journal of Experimental Social Psychology*, 13(3): 279-301.

Sánchez-Pagés. Santiago, and Marc Vorsatz. 2007. "An Experimental Study of Truth-telling in a Sender-receiver Game." *Games and Economic Behavior*, 61: 86-112.

Selten, Reinhard. 1967. "Die Strategiemethode zur Erforschung des Eingeschränkt Rationalen Verhaltens im Rahmen eines Oligopolexperiments." In H. Sauermann (ed.), *Beiträge zur experimentellen Wirtschaftsforschung*, Tübingen: Mohr: 136-168.

Serra-Garcia, Marta, Eric Van Damme, and Jan Potters. 2013. "Lying About What You Know or About What You Do?" *Journal of the European Economic Association*, 11(5): 1204-1229.

Stapel, Diederik. 2012. *Derailed: The Rise and Fall of Diederik Stapel*. Netherlands: Prometheus.

Sutter, Matthias. 2009. "Deception Through Telling the Truth?! Experimental Evidence from Individuals and Teams." *Economic Journal*, 119: 47-60.

Tadelis, Steven. 2011. "The Power of Shame and the Rationality of Trust." *Mimeo*.

Vanberg, Christoph. 2008. "Why Do People Keep Their Promises? An Experimental Test of Two Explanations." *Econometrica*, 76(6): 1467-1480.

Appendix: Not for Publication

Appendix A – Theory of Shame from Lying

We introduce shame into the sender's utility function in a nature related to Tadelis (2011). We assume that the sender cares about her own payoff and also has preferences over the receiver's beliefs. In particular, the sender feels shame when she is perceived as a liar. Our theory introduces three main elements: (1) the receiver's posterior belief that the sender is a liar, (2) the sender's sensitivity to shame and (3) the salience of shame.

We model shame aversion as the disutility from being perceived as a liar in a sender-receiver setting. Our model could be extended into other more general settings. For example, someone might experience shame if she is perceived as self-interested or a type with low lying costs. Battigalli and Dufwenberg (2009) explore more general interpretations of shame aversion.

In a model which incorporates shame, we propose the following utility function for the sender:

$$u_S(z, m, \mu_R) = \pi_S(z) - \rho(m)\gamma_S(1 - \mu_R[m^T]), \quad (1)$$

where z is the outcome of the game, $\pi_i(z)$ is the monetary payoff for player $i \in \{S, R\}$; $m \in \{m^T, m^F\}$ represents the sender's message, where superscripts T and F denote true and false, respectively; $\mu_R[m^T]$ is the receiver's posterior belief about the probability the sender sent a truthful message; γ_S is a positive individual-specific parameter which measures the sender's sensitivity to shame aversion; and $\rho(m)$ is a strictly positive function which measures shame *salience*. Note that the utility function of the sender depends on the receiver's beliefs (μ_R), which are not known, so the sender relies on second-order beliefs.

In the standard game, there are two outcomes that are conflicting. Compared to outcome A, outcome B yields a higher material payoff for the sender but a lower material payoff for the receiver. The four terminal nodes of the game are represented by $Z = \{m^T, m^F\} \times \{A, B\}$. Since the game is a cheap-talk game and messages do not affect payoffs, we will write the payoffs as functions of outcomes rather than as functions of both outcomes and messages, e.g., $\pi_S(A)$. From the receiver's perspective, $\pi_S(z)$ and $\pi_R(z)$ are unknown and determined by treatment parameter $x \in X$ observed only by the sender. The sender's message is chosen as a function of x . To summarize, the sender's strategy set is given by $S_S = \{m^T, m^F\}^X$ where X represents the number of treatments (there are two payoff possibilities in the experiment). The receiver's strategy set is given by $S_R = \{A, B\}^{\{m^T, m^F\}}$. Strategies within the set will be denoted σ_S and σ_R , respectively. Under conflicting payoffs, we have $\pi_S(A) < \pi_S(B)$ and $\pi_R(A) > \pi_R(B)$.

We define $\rho(m)$ such that individuals have more amplified shame when they have more of a reason to feel shame—that is, when they have lied. The intuition is that when individuals tell the truth, regardless of the environment, they have less reason to worry about the other person's beliefs. This is intended to capture the stylized notion that individuals “worry” less when they have told the truth than when they have lied. Let us define shame salience:

$$\rho(m) = \begin{cases} \rho, & m = m^F \\ 1, & m = m^T \end{cases} \quad \text{such that } \rho > 1$$

Let us denote the receiver's posterior belief about the sender having chosen a true message by $\mu_R[m^T | m, r] \in [0, 1]$. Consider a setting in which the receiver might find out with certainty, after all actions are taken, whether the sender's message was truthful. The posterior belief is then conditioned on whether the lie will be revealed, $r \in \{0, 1\}$, as well as

the history of play, which corresponds to $m \in \{m^T, m^F\}$. When the lie will be revealed ($r = 1$), the receiver knows m with certainty. When the lie is not revealed ($r = 0$), the receiver has no information about the history of play.

We consider the set of possible beliefs held by the receiver, and thus, the second-order beliefs held by the sender. First, the receiver can make a perfect inference when the lie (or truth) will be revealed. It is clear that $\mu_R[m^T|m^T, r = 1] = 1$ and $\mu_R[m^T|m^F, r = 1] = 0$. When the lie (or truth) will not be revealed after all actions have been taken, the receiver does not have an observable history on which to condition. Therefore, $\mu_R[m^T|r = 0] \in (0,1)$.⁶

Proposition 1 characterizes a unique equilibrium when the lie will be revealed after all actions have been taken. The intuition is straightforward. Senders face a tradeoff between shame and their own material payoffs, so certain types will send a truthful message and other types will send a false message.

Proposition 1 (Reveal): Let us define type $\gamma_S^1 \equiv \frac{\pi_S(B) - \pi_S(A)}{\rho}$. If $r = 1$, there is a sequential equilibrium such that all types $\gamma_S > \gamma_S^1$ send message m^T and all types $\gamma_S \leq \gamma_S^1$ send message m^F .

Proof of Proposition 1: When the lie or truth will be revealed ex post, we know that $\mu_R[m^T|m^T, r = 1] = 1$ and $\mu_R[m^T|m^F, r = 1] = 0$. If type γ_S chooses message m^T , she has utility $\pi_S(A)$. If type γ_S chooses message m^F , she has utility $\pi_S(B) - \rho\gamma_S$. Therefore, m^T is a best response for all $\gamma_S > \gamma_S^1$ and m^F is a best response for all $\gamma_S < \gamma_S^1$ where $\gamma_S^1 = \frac{\pi_S(B) - \pi_S(A)}{\rho}$. \square

Proposition 2 characterizes a unique equilibrium when the lie will *not* be revealed.

The intuition is similar to the case in which the lie *will* be revealed.

⁶ Note that as long as $\sigma_S = m^T$ for some $\gamma_S > 0$ and similarly $\sigma_S = m^F$ for some $\gamma_S > 0$, we know $\mu_R[m^T|r = 0]$ is strictly in the interior.

Proposition 2 (No Reveal): Let us define type $\gamma_S^0 \equiv \frac{\pi_S(B) - \pi_S(A)}{(\rho - 1)(1 - [m^T | r = 0])}$. If $r = 0$, there is a sequential equilibrium such that all types $\gamma_S \leq \gamma_S^0$ send message m^F and all types $\gamma_S > \gamma_S^0$ send message m^T .

Proof of Proposition 2: If type γ_S chooses message m^T , she has utility $\pi_S(A) - \gamma_S(1 - \mu_R[m^T | r = 0])$. If type γ_S chooses message m^F , she has utility $\pi_S(B) - \rho\gamma_S(1 - \mu_R[m^T | r = 0])$. Therefore, m^T is a best response for all $\gamma_S > \gamma_S^0$ and m^F is a best response for all $\gamma_S < \gamma_S^0$ where $\gamma_S^0 \equiv \frac{\pi_S(B) - \pi_S(A)}{(\rho - 1)(1 - \mu_R[m^T | r = 0])}$.

For uniqueness, note that when $\gamma_S^0 = 0$, correct beliefs imply $\mu_R[m^T | r = 0] = 1$. We note that $\mu_R[m^T | r = 0]$ is monotonically decreasing in γ_S^0 with $\lim_{\gamma_S^0 \rightarrow \infty} \mu_R[m^T | r = 0] = 0$. Hence there is a unique γ_S^0 that satisfies the equilibrium above. \square

Theorem 1 establishes the basis for Hypothesis 1. It demonstrates that fewer senders will send a truthful message when the lie is not revealed than when the lie is revealed. Even more, any type that will tell the truth *without* revelation after all actions will *also* tell the truth in an environment *with* revelation. Similarly, any type that will lie *with* revelation will *also* lie without revelation.

Theorem 1 (Shame): Assume the conditions under which Propositions 1 and 2 hold. Then for any set of beliefs, $\gamma_S^0 > \gamma_S^1$.

Proof of Theorem 1: Assume the conditions under which Propositions 1 and 2 hold. Suppose otherwise that $\gamma_S^0 \leq \gamma_S^1$. Then we have $\frac{\pi_S(B) - \pi_S(A)}{(\rho - 1)(1 - \mu_R[m^T | r = 0])} \leq \frac{\pi_S(B) - \pi_S(A)}{\rho}$ if and only if $\mu_R[m^T | r = 0] \leq \frac{-\rho}{\rho - 1} < 0$, a contradiction. \square

Receiver behavior is straightforward since we assume receivers will follow the senders' messages.⁷ Formally, we assume that receivers will employ a trusting strategy Y by following the sender's message, where $Y = (A \text{ if } m^T, B \text{ if } m^F)$.⁸ It is important to note that the intuition embedded in Propositions 1 and 2 (and thus Theorem 1) follows through if we were to assume that a certain percentage of receivers follow and a certain percentage of receivers do not follow senders' messages. Hypothesis 1 follows from Theorem 1.

Extending the model to include guilt aversion, the sender's utility function is given by:

$$u_S(z, m, \mu_R, \alpha_R) = \pi_S(z) - \rho(m)\gamma_S(1 - \mu_R[m^T]) - \theta_S \max\{0, E_{\alpha_R}[\pi_R] - \pi_R(z)\}, \quad (2)$$

where α_R is the receiver's pre-play belief about how the game will be played, $E_{\alpha_R}[\pi_R]$ is the receiver's expected payoff calculated using α_R , and θ_S is a positive individual-specific exogenous parameter which measures the sender's sensitivity to "guilt aversion."⁹

The receiver has the first-order belief about the sender's strategies, $\alpha_{R,S} \in \Delta(X, S_S)$ and about her own strategies, $\alpha_{R,R} \in \Delta(S_R)$. The sender uses second-order beliefs about α_R in her decisions. Recall that receivers, by assumption, follow a trusting strategy, Y . The first-order belief is given by $\alpha_R = \alpha_{R,S} \times Y$ which gives expected payoff $E_{\alpha_R}[\pi_R]$.

⁷ With a sufficiently large message space, senders likely believe that conditional on not trusting the sender's message, the receiver will have a low probability of choosing the correct state of the world. In contrast, if there were only two messages, the chance that receivers guess the correct outcome conditional on not trusting is 50%. In this case, there is the possibility that senders "lie" by telling the truth if they expect receivers not to follow their message (Sutter, 2009). Given that we use a message space that is sufficiently large, we assume that senders expect receivers to follow the pure strategy, $S_R = Y$.

⁸ This is empirically verified in our experiment, where a large majority of receivers follows the senders' messages.

⁹ Kőszegi (2006, 2010) develops models in which individuals gain utility from anticipation. In this paper, senders anticipate the disappointment of receivers, which could make them feel guilty.

Appendix B – Truth-telling Rates by Treatment

<i>Control</i>	
High 29.7% (11/37)	Low 29.7% (11/37)
<i>Guilt</i>	
High 22.5% (9/40)	Low 30.0% (12/40)
<i>Guilt and Shame</i>	
High 42.5% (17/40)	Low 55.0% (22/40)

Appendix C: Protocol

Figure C1 – Screenshot of Sender’s Choice

The result of the die throw is: XY.

Please send your message to the receiver now. In case...

<p>... the coin toss determines that the payoffs will be paid in accordance with "payoff case 1", I wish to send the following message:</p> <p>The result of the throw of the six-sided die is:</p> <input type="text"/>	<p>... the coin toss determines that the payoffs will be paid in accordance with "payoff case 2", I wish to send the following message:</p> <p>The result of the throw of the six-sided die is:</p> <input type="text"/>
---	---

OK

C2 Experimental instructions

Instructions in BLACK are seen by participants in both treatments and the *Control*. Instructions specific to the *Guilt treatment* and the *Guilt and Shame treatment* appear in BLUE. Instructions specific to the *Guilt and Shame treatment* appear in RED.

C2.1 Sender Instructions

Welcome to this economic experiment!

This experiment is anonymous. Nobody will find out with which other participant he or she interacts. The experiment is not repeated – every decision in this experiment is made only once. The experiment analysis is also conducted anonymously. The money earned by you in this experiment is paid to you in cash at the end of the experiment. Please read these instructions carefully.

In this experiment, you are the sender of two messages. A receiver is assigned to you at random.

A computer version of a six-sided die is about to throw a number. This number will not be the same for all pairs of participants. **The result of the throw of the die will be told to you right away on your screen.** The receiver is not **informed during the experiment** what the result of the throw is. However, he or she **is indeed informed that you have been informed** about the result of the die role.

We would now ask you please to decide **for each of the two payoff cases**, described on the following page, which message – with regard to the die role – you wish to send to the receiver. In each case, you can send **one of the following six** messages:

Message 1: "The result of the throw of the six-sided die is 1"

Message 2: "The result of the throw of the six-sided die is 2"

Message 3: "The result of the throw of the six-sided die is 3"

Message 4: "The result of the throw of the six-sided die is 4"

Message 5: "The result of the throw of the six-sided die is 5"

Message 6: "The result of the throw of the six-sided die is 6"

Your payoffs are determined in part by the choice of receiver and partly by a draw. A computer version of a coin toss will determine whether you and the receiver will be paid in accordance with “payoff case 1” or “payoff case 2”. You and the receiver may be paid off in accordance with “payoff case 1” with a chance of 50% and in accordance with “payoff case 2” with a chance of 50%. The payoff cases are distinguished as follows:

Payoff case 1:

- If the receiver chooses **the actual result** of the die role, then **you receive 10€** and the **receiver gets 10€**.
- If the receiver chooses **a different result to that** of the die role, then **you receive 15€** and the **receiver gets 5€**.

Payoff case 2:

- If the receiver chooses **the actual result** of the die role, then **you receive 15€** and the **receiver gets 15€**.
- If the receiver chooses **a different result to that** of the die role, then **you receive 20€** and the **receiver gets 10€**.

The coin toss determines whether “payoff case 1” or “payoff case 2” becomes payoff-relevant, **before your message to the receiver is transmitted**. This means the receiver only receives the one message that you send for the payoff-relevant “payoff case”. **Following this, he or she chooses a number between 1 and 6. In so doing, the receiver can either choose the number you sent him or her, or else choose another number between 1 and 6.**

Only you are informed of the payoff figures described above and associated with the receiver’s respective number choice. The receiver is **not informed** of these payoff figures. However, he or she **is informed that you are informed** of the payoff figures associated with his/her number choice. **In addition, once the experiment is over, he or she is informed of the actual result of the die role (once all decisions in the experiment have been made and all payoffs have been determined, as described above).**

Only at the end of the experiment will you find out whether the payoff was determined by “payoff case 1” or “payoff case 2”. Please decide on the message you wish to send in case the payoffs are determined by “payoff case 1”. And please decide on the message you wish to send in case the payoffs are determined by “payoff case 2”. **Please make your choices for both cases carefully, since each of the two cases could be payoff-relevant both for you and for the receiver.**

Please note that a group of participants in this laboratory recently took part in a decision task with an identical set of rules to the one presented here to you (i.e., the same choice possibilities for the participants, the same participant allocation and the same respective payoff cases). The participants in the **receiver** role earned on average approximately 10€ (rounded to full euro figures). Please note further that the receiver was also informed that participants recently earned on average 10€ in the receiver role.

Here is a summary of the experiment proceedings:

- 1.) A die role determines a number (1, 2, 3, 4, 5, or 6).
- 2.) You are informed (in the instructions distributed here) of the payoff figures associated with the respective choice of a number by the receiver.
- 3.) You are informed about the die role.
- 4.) You send a message, for each of the two payoff cases, on the number determined by the die role (1, 2, 3, 4, 5, or 6).
- 5.) The coin toss determines whether “payoff case 1” or “payoff case 2” becomes payoff-relevant.
- 6.) The receiver gets your message on the payoff-relevant payoff case.

- 7.) The receiver chooses a number (1, 2, 3, 4, 5, or 6) that determines your payoff and the receiver's payoff.
- 8.) The receiver is informed about the number determined by the die role (1, 2, 3, 4, 5, or 6).

(Part 2 – on the screen:)

We have a further question on the experiment. Your answer to this question will never be passed on to the receiver.

Today, XYZ participants in the receiver role took part in the experiment. Please estimate how many participants in this role, when choosing the number, decided to follow the message they received from the participant in your role. If your estimate is correct, then you will earn an extra 2€, on top of your current earnings. If your estimate deviates by ± 1 , you will earn an extra 1€. It is therefore in your own interest to give your actual estimate.

Please give your estimate here: ____

C2.2 Receiver Instructions

Welcome to this economic experiment!

This experiment is anonymous. Nobody will find out with which other participant he or she interacts. The experiment is not repeated – every decision in this experiment is made only once. The experiment analysis is also conducted anonymously. The money earned by you in this experiment is paid to you in cash at the end of the experiment. Please read these instructions carefully.

In this experiment, you are the receiver of a message. You are randomly assigned a sender.

At the beginning of the experiment, a computer version of a six-sided die threw a number. This number was not the same for all pairs of participants. You are **not** informed **during the experiment** what the result of the throw is. **Once the experiment is over (once all decisions in the experiment have been made by all participants), you are informed of the actual result of the die role. The sender knows that you are informed of the actual result of the die role at the end of the experiment. The sender was told the result of the die role at the beginning of the experiment** (before he or she made any decisions in the experiment).

After the sender has been informed about the die number that has been thrown, he or she sent you a message. The sender was able to choose from the following messages:

Message 1: "The result of the throw of the six-sided die is 1"

Message 2: "The result of the throw of the six-sided die is 2"

Message 3: "The result of the throw of the six-sided die is 3"

Message 4: "The result of the throw of the six-sided die is 4"

Message 5: "The result of the throw of the six-sided die is 5"

Message 6: "The result of the throw of the six-sided die is 6"

The message the sender has sent to you will be shown to you on your screen in a few moments.

We would ask you please to choose a number between 1 and 6. **The message you receive is the only information you receive, in the course of the experiment, about the result of the die role.** Your number choice determines both your own payoff and the sender's payoff.

If you choose the number that **corresponds to the actual result of the die role**, both of you will be paid in accordance with **Option A**. If you choose the number that **does not correspond** to the actual result of the die role, both of you will be paid in accordance with **Option B**. **These payoff options are known only to the sender.**

Please note that a group of participants in this laboratory recently took part in a decision task with an identical set of rules to the one presented here to you (i.e., the same choice possibilities for the participants, the same participant allocation and the same respective payoff cases). The participants in **your role** earned on average approximately 10€ (rounded to full euro figures). Please note further that the sender was also informed that participants recently earned on average 10€ in your role.

Here is a summary of the experiment proceedings:

- 1.) A die role determines a number (1, 2, 3, 4, 5, or 6).
- 2.) The sender is informed of the payoff options associated with your respective choice of a number.
- 3.) The sender is informed about the die role.
- 4.) The sender sends you a message on the number determined by the die role (1, 2, 3, 4, 5, or 6).
- 5.) You choose a number (1, 2, 3, 4, 5, or 6) that determines your payoff and the payoffs of the participant allocated to you.
- 6.) **You are informed about the number determined by the die role (1, 2, 3, 4, 5, or 6).**