

SAM 17 2012**ISSN: 0804-6824**

August 2012

Discussion paper

When do we lie?

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This series consists of papers with limited circulation, intended to stimulate discussion.

When do we lie?*

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August 31, 2012

Abstract

The paper reports from an experiment studying how the aversion to lying is affected by non-economic dimensions of the choice situation. Specifically, we study whether people are more or less likely to lie when the content of the lie is personal, when they base decisions on intuition, and when they are in a market context. We also study how aversion to lying depends on personal characteristics, including age, gender, cognitive ability, personality and social preferences. Our main finding is that non-economic aspects of the choice situation are crucial in understanding aversion to lying. In particular, we find that people are less likely to lie when the content of the message is personal. We also find large effects from priming the participants to rely on intuition, but, interestingly, in this case the effect only applies to males. Finally, we find that people who are highly motivated by social preferences are more averse to lying, but there is no significant relationship between lying behavior and other personal characteristics.

JEL classification: D63.

*We dedicate this paper to the first research coordinator of The Choice Lab, late Cecilie Rasmussen, who passed away far too young on a research trip to Berkeley in the spring of 2012. We thank the present research coordinator Ranveig Falck as well as Ida Elise S. Bergsmark, Eli Birgitte S. Bergsmark, Kristina Bott, Anne-Mari Bratholt, Pål Kristian Granholt, Kartika Sari Juniwaty, John McGregor, Andreas Olden, Kristin Orse, Charlotte Ringdal, Ana Beatriz Aguilar Borges Santos, Øivind Schøyen and Kristina Øystese for great research assistance on the project. We also thank participants at the Rady Conference on “Deception, Incentives and Behavior” in San Diego for constructive comments. The project was financed by support from the Research Council of Norway, research grant 202484.

1 Introduction

It is often argued, in particular by moral philosophers, that it is bad to tell lies irrespective of the consequences of doing so. Immanuel Kant famously asserted that lying, or deception of any kind, is forbidden in any circumstance and irrespective of the consequences (Kant, 1949 [1785]). Since communication is a key element in almost all social interaction, including in economic transactions, it is important to understand when, and to what extent, people are motivated by such non-consequentialistic moral reasoning.

A growing literature in economics has studied the prevalence of lying in different economic environments and how it relates to other moral motives (Gneezy, 2005; Dreber and Johannesson, 2008; Sánchez-Pagés and Vorsatz, 2009; Erat and Gneezy, 2012; López-Pérez and Spiegelman, Forthcoming; Childs, 2012; Friesen and Gangadharan, 2012; Lundquist, Ellingsen, and Johannesson, Forthcoming).¹ In particular, Erat and Gneezy (2012) report experimental data showing that a substantial fraction of people refuse to tell a lie that would be beneficial for all parties involved, referred to as Pareto White Lies. Their design identifies a pure aversion to lying, since it is hard to see that anything else can motivate not lying in such situations. At the same time, they show that people are not strictly non-consequentialistic in their lying behavior, but also take into account the economic consequences of lying and lie less when it hurts themselves or others.

In this paper we examine how non-economic dimensions of the choice situation affect the aversion to lying. More specifically, we examine whether people are more or less averse to lying when the content of the lie is personal, when they base decisions on intuition, and when they are in a market context. These aspects are potentially of great importance when considering whether we should expect people to communicate the truth or not. For example, should an employer expect an employee whom he knows to be truthful about personal issues also to be truthful when communicating about non-personal issues? Should we trust the intuitive response of a politician more than his reflective statements? Should universities expect more dishonesty from their students if they view themselves as “customers in an educational market” rather than as traditional students?²

In order to study how non-economic dimensions affect the aversion to lying, we introduced four treatments in a sender-receiver game (Gneezy, 2005), which allows us to identify the causal effect of changing the non-economic environment. A key element in all four treatments is that it is beneficial for both the sender and the receiver that the sender lies when sending the message to the receiver. The decision not to lie

¹There is also a related important literature on dishonesty and promise breaking, including Brandts and Charness (2003), Charness and Dufwenberg (2006), Sutter, Bosman, Kocher, and Winden (2009), and Charness and Dufwenberg (2010).

²For a broader discussion of the implications of students taking the consumer perspective, see New York Times, January 3, 2010 (<http://roomfordebate.blogs.nytimes.com/2010/01/03/are-they-students-or-customers/>).

in this experiment thus reflects a pure aversion to lying that outweighs the beneficial consequences of lying. In addition to the base treatment, we conducted three treatments that each manipulated one non-economic aspect of the choice situation. In the personal treatment, the content of the lie was personal (in contrast to the impersonal nature of the lie in Erat and Gneezy (2012)), whereas in the intuition treatment and the market treatment we used a priming sequence to capture the marginal behavioral effect of being in a market context and relying on intuition, respectively. Finally, in the experiment, we also collected information about gender, personality (measured by the Big Five Inventory), cognitive ability (measured by the WAIS-IV Matrices), and social preferences (measured by the share given in an independent dictator game). This allows us to study whether the aversion to lying relates to important individual characteristics.

A related literature on lying and moral motivation more generally suggests that the three non-economic dimensions studied by our treatments could be important for understanding aversion to lying. There is evidence showing that people lie less in personal relationships (DePaulo, Kashy, Kirkendol, and Epstein, 1996; DePaulo and Kashy, 1998; Chakravarty, Ma, and Maximiano, 2011), which may suggest that people lie less when the content of the lie is personal. Lundquist et al. (Forthcoming) find, in line with this, that individuals have an aversion towards lying about personal information, but they do not compare this to a setting where people can lie about something impersonal. There is also some evidence suggesting that people might lie less when relying on intuition. In particular, Greene, Nystrom, Engell, Darley, and Cohen (2004) show that people rely less on calculations of costs and benefits when they base their moral judgment on intuition rather than reasoning, which suggests that non-consequentialistic considerations, like a pure aversion to lying, may play a larger role when intuition is invoked. At the same time, Rand, Greene, and Nowak (Forthcoming) show that intuition supports cooperation in social dilemma situations, which suggests that the fact that lying benefits the other participant may pull in the direction of more lying in the intuition treatment. Finally, several experiments have documented, by the use of priming techniques, that the introduction of a market context increases the weight people place on self-interest (Vohs, Mead, and Goode, 2006) and efficiency (Al-Ubaydli, Houser, Nye, Paganelli, and Pan, 2011), which may imply that the aversion to lying is given relatively less weight in a market setting where lying is beneficial to everyone.

Our main finding is that non-economic aspects of the choice situation are crucial in understanding aversion to lying. In fact, by manipulating the non-economic environment, we find effects of similar size as those established by manipulating the payoff structure in Erat and Gneezy (2012). In particular, we find that the share of participants lying drops by 20 percent when the content of the message is personal. We also find large effects from priming the participants to rely on intuition, but, interestingly, in this case the effect only applies to males; the share of male participants that lie drops by almost 30 points in the intuition treatment, where only 50 percent of the males are willing to lie even when doing so benefits both parties. Among the female participants,

we do not see any effect of being primed to think intuitively. Finally, we do find a small effect of the market priming making the participants likely to lie, but this effect is not statistically significant.

Among the background variables, we find a close relationship between lying aversion and pro-social behavior in the dictator game, where those who give a large share in the dictator game are much less likely not to lie. Other personal characteristics have little effect, and, interestingly, we do not find any gender difference on the overall level of lying across the four treatments.

The rest of the paper is organized as follows. Section 2 presents the experimental design. Section 3 presents the results while section 4 concludes.

2 Design

We start out by describing the base treatment, before we detail the treatments manipulating the non-economic aspects of the choice situation.³ Finally, we describe the collection of background data, the experimental procedures, and the sample.

2.1 Base treatment

The base treatment is a version of the Pareto White Lies treatment in the sender-receiver game in Erat and Gneezy (2012). At the beginning of the experiment the participants are randomly assigned the role of sender or receiver. The computer then rolls a six-sided dice and the sender, but not the receiver, is informed about the outcome. The sender sends a message to the receiver about the outcome of the dice roll, choosing between six possible messages of the type: “The outcome from the roll of the six-sided die is X.” Obviously, only one of the six possible messages is true, and the choice of message is thus a choice about whether or not to lie to the receiver.

Based on the message from the sender, the receiver then chooses a number from 1 to 6. If the receiver chooses the same number as the dice roll, they both receive the same low payment (20 NOK, approximately 3.5 USD). If the receiver chooses a different number than the dice roll, they both receive the same high payment (30 NOK). In addition, there is a penalty of 2 NOK paid by the receiver if he or she chooses differently from the number communicated by the sender.⁴

Both the sender and the receiver are informed about the general rules of the game. The complete payment structure, however, is only known to the sender. The receiver is informed about the penalty for deviating and the fact that the payment to both of them only depends on his or her choice.

Since the receiver has no reason to think that any other number is better, and he or she furthermore knows that there is a penalty for deviating from the number commu-

³The complete instructions are provided in the appendix.

⁴This penalty was not a part of the design in Erat and Gneezy (2012), but introduced by us to make it costly for the sender to make a random choice.

nicated by the sender, the rational choice is to select this number. In turn, this implies that the sender should lie if he or she is only concerned with the outcome from the experiment, since both participants then receive a higher payment. This also applies for participants who have distributional concerns, since the final outcome is an equal split in both cases. Thus, there is no room for sophisticated deception through truth telling (Sutter, 2009).

Prior to the introduction of the sender-receiver game, all participants are asked to spend five minutes writing a text about what it is to live in Bergen (the city where the experiment took place). We introduce the text-phase in the base treatment to ensure that the variation across treatments is in the topic given to them in the text-phase and not in the presence of a text-phase. We consider the topic of the base treatment a neutral manipulation, since we fail to see that the writing of such a text should affect behavior in the sender-receiver game in a systematic manner.⁵

2.2 Treatment manipulations

In order to study non-economic dimensions of the choice situation, we manipulate the text-writing phase for the senders, whereas the receivers in all treatments write about how it is to live in Bergen.

To study whether the impersonal nature of the lie matters, we implemented a personal treatment where people are given the opportunity to lie about something personal. The lie in the base treatment is clearly impersonal in nature, the participants are only given the opportunity to lie about the roll of a dice. The introduction of a personal lie is not entirely straightforward in the present design, since a message about something personal (true or false) could affect the behavior of the receiver. For example, if the message revealed a personal characteristic of the sender, then the receiver might have a preference for rewarding or punishing the sender on the basis of this personal characteristic. This would introduce a new dimension to the sender's decision of whether to lie or not, and we would no longer be able to uniquely identify an aversion to lying.

To avoid this problem, we use the text-writing phase to randomly assign a task to each sender. Specifically, the sender is told the outcome of the roll of the dice, and then asked to spend five minutes writing about this number. They are then asked to send a message of the following kind: "The outcome from the roll of the six-sided dice is X and I spent five minutes writing about this number."⁶ If the sender decides not to tell

⁵This is an example of a text written in the base treatment: "Bergen is not so rainy as they say. The weather is changing, but is nothing to worry about. The people are more welcoming than in other places I've been to in Norway, they take pride in their city. But unfortunately I have not met a lot of them. Bergen is a student city and the streets, buses, nightclubs etc. are filled with them. Overall Bergen is a nice and exiting place to live."

⁶This is an examples of a text written in the intuition treatment: "Situations related to the number 4 are for instance when I take busline number 4. I guess it is the number of swingstates the Republicans are trying to win from Obama in the election as well, Ohio, Wisconsin, Connecticut, and Florida? I think

the truth in this case, he or she has to lie about something personal, namely what he or she has been doing the last five minutes. At the same time, since the roll of the dice is random, the lie does not reveal any personal characteristics of the sender. In all other respects, the personal treatment is identical to the base treatment.

To study the effect on lying of relying on intuition or being in a market context, we prime the individuals by the topic given to them in the text-writing phase. In the intuition treatment, the senders are asked to spend five minutes describing a situation where they had benefited from trusting their intuition, whereas in the market treatment they were asked to spend five minutes describing a situation in which they benefited from buying or selling a good or a service.⁷ Thus, in the intuition treatment they have to think about a situation where they relied on intuition, and in the market treatment they have to think about a situation where they were in a market context.⁸ In all other respects, the intuition and market treatments are identical to the base treatment. In particular, in these two treatments, the message is impersonal and the sender only communicates the roll of the dice. This design therefore allows us to capture the marginal behavioral effect of relying on intuition or being in a market context without changing any feature of the actual sender-receiver game.

2.3 Background data

In an independent experiment conducted before the sender-receiver game, but in the same session, all participants took part in a version of the dictator game where they were asked to distribute 200 NOK between themselves and another participant. The share given to the other participant in this experiment provides us with a measure of the participants' pro-social preferences.

After the sender-receiver game, the participants were given the opportunity to write a paragraph on what motivated their choices. This provides us both with a test of whether any of the treatments generated an experimenter demand effect and also some

about the media, often referred to as the fourth pillar of the state, along with parliament, government and courts. July fourth is also a national holiday in the US."

⁷In the intuition treatment, we adopt the conceptual priming manipulation of Rand et al. (Forthcoming). An alternative approach to studying how people behave when they rely on intuition would have been to give the participants in the intuition treatment a limited time to decide on what message to send. However, such a design would have created a confound between intuition and understanding of the experiment, since it could have been the case that participants who had less time to decide which message to send would have been less likely to understand that lying would result in the best outcome.

⁸We here provide two examples: "I feel I have benefitted from most situations where I have trusted my gut. For example when I was walking home from a club in Oslo a couple of weeks ago. It was late. My intuition was telling me that I should not take the usual shortcut. The next morning I read in the newspaper that a guy had been robbed." (intuition treatment); "I was selling my old computer, a MacBook Air, because I wanted to buy a new one. The computer was only 6 months old, and the buyer didn't need a new computer from the store, so he was happy with the purchase, which I offered to him for a reasonable price. In the end, we both came out happy. He had a computer in perfect shape at a very good price and I had money to spend on a new computer. It was a win-win situation, I'd be happy to do it again" (market treatment).

further understanding of the role of different possible motives. None of the participants reported anything that indicated an experimenter demand effect, but many participants highlighted both the ethical and selfish dimensions involved in the situation.

In the final part of the experiment, the participants answered the 44-item Big Five Inventory (John, Donahue, and Kentle, 1991; Benet-Martínez and John, 1998). All participants were also asked to complete the WAIS-IV matrix reasoning test (Wechsler, 2008), which uses 26 questions to measure non-verbal abstract problem solving.

2.4 Procedures and sample

We recruited participants among first-year students at the Norwegian School of Economics, where a total of 352 subjects participated in 13 sessions. Table 1 provides an overview of the background characteristics of the participants. We observe that the sample is fairly balanced with respect to gender, and that the average participant is about 20 years old. There is relatively little variation in the age and cognitive ability score, which reflects that these are all students at the same business school. The variation in the personality dimensions is in line with what is typically observed in student samples. The average share given in the dictator game was 0.292, which is similar to what is observed in earlier dictator games (Engel, 2011).

[Table 1 about here.]

The experiment was conducted in a computer lab using web-based interface and was double blind, i.e., neither subjects nor experimenters could associate decisions with particular subjects. At the beginning of the experiment, the participants were randomly assigned to one of the four treatments. Each sender took only part in one game, while each receiver took part in, on average, four games (with a different sender in each game). All payments were made in cash immediately after the experiment. Special care was taken so that the payment procedure ensured anonymity. The computer assigned a payment code to each of the participants, and a group of assistants who were not present in the lab during the experiment prepared envelopes containing the payments corresponding to each payment code. After bringing the envelopes to the lab, the assistants immediately left and the envelopes were handed out in accordance with the payment codes. This procedure was explained to all participants at the start of the experiment.

3 Results

We find that a significant share of the senders, 36 percent, decided to send a true message to the receiver. The large majority of receivers, 71 percent, chose the number communicated by the sender, which implies that lying increased the expected gain both for the sender and the receiver. This confirms the finding in Erat and Gneezy

(2012) that a substantial fraction of people have a pure aversion to lie, and therefore tells the truth even when lying benefits both parties. The importance of honesty was also highlighted by many participants when describing what motivated their choices, as illustrated by the following quote: “Deception shows lack of integrity, and I will not sell out my integrity.”

3.1 Analysis of treatment differences

The experimental design allows us to study the causal effect on lying behavior of manipulating different non-economic aspects of the choice situation. The share of participants lying in each of the four treatments is reported in Figure 1, where we observe important differences across treatments. In the base treatment, 69.1 percent of the participants send a false message. This share drops substantially by more than 20 percent in the personal treatment, from 69.1 percent to 55.2 percent, when people have to make a choice between telling the truth or making a personal lie. A similar drop is observed in the intuition treatment, where people were primed to rely on intuition when making the decision of whether or not lie; in this case, 42 percent of the participants decide to send a true message. In contrast, the highest share of participants lying, 72.3 percent, is observed in the market treatment.

[Figure 1 about here.]

Table 2 shows that the average treatment effect of introducing a personal lie is statistically significant (when compared to the base treatment), also when controlling for background characteristics of the participants ($p=0.078$). The two other average treatment effects are in the predicted direction relative to the base treatment, but not statistically significant ($p = 0.18$ for the intuition treatment; $p = 0.69$ for the market treatment). Overall, we observe that controlling for background variables has little effect on the estimated average treatment effects.

[Table 2 about here.]

Table 2 also reports how the propensity to lie depends on personal characteristics. We observe that the measure of social preferences is strongly related to lying behavior ($p = 0.01$), where participants who are more motivated to give in the dictator game also are more likely not to lie in the sender-receiver game. The estimated marginal effect implies that the share of people who lie among those who take everything in the dictator game is 15 percentage points higher than among those who split equally. This finding is far from obvious. Pro-social participants have an additional argument for lying in the sender-receiver game relative to a purely selfish participant, since lying benefits both participants, but they are still more likely to tell the truth. This suggests that aversion to lying not only is positively associated with pro-social preferences, but for many a stronger moral motive than the concern for the welfare of others.

The propensity to lie is not statistically significantly associated with any of the other background characteristics. In particular, we do not observe a statistically significant gender difference ($p = 0.53$), which is in contrast to the previous literature showing that females are less likely to tell both Pareto White Lies (Erat and Gneezy, 2012) and lies that benefit themselves and hurt others (Dreber and Johannesson, 2008; Friesen and Gangadharan, 2012). In fact, in the present experiment, females are slightly more likely to lie than males; 65.6 percent versus 61.9 percent. We also observe that age, cognitive ability, and personality are not significantly related to lying behavior.

3.2 Heterogeneity in treatment effects

We here consider whether there are heterogenous treatment effects in our sample, where we focus on gender, since there is an extensive literature showing that males and females often respond differently to experimental manipulations (Croson and Gneezy, 2009), including in studies of lying behavior (Dreber and Johannesson, 2008; Erat and Gneezy, 2012; Friesen and Gangadharan, 2012).

Table 2 reports regression for the three non-economic treatments (compared to the base treatment), where we have included an interaction effect between gender and treatment status.

[Table 3 about here.]

We do not observe a statistically significant treatment difference between males and females. Still, the table illuminates that the intuition treatment had a very strong and statistically significant effect on the male participants ($p = 0.05$), with an estimated reduction in the share of male participants lying of 26.5 percentage points. In contrast, the intuition treatment had almost no effect on the females. One possible interpretation of this result is that males are less likely to rely on intuition in decision making than females (Frederick, 2005), and that the effect of the priming therefore is larger for males (Benjamin, Choi, and Strickland, 2010).

4 Conclusion

We have shown that non-economic aspects can be as important as economic incentives in determining lying behavior. This finding is striking, since our manipulations of the non-economic aspects are extremely weak. In particular, we introduce a very innocent personal element in the communication, but still it substantially reduces people's willingness to lie. This may suggest that people often come close to the Kantian non-consequentialistic ideal in the personal sphere and other contexts where personal issues are involved.

Similarly, we have shown that a slight priming of males to think in intuitive terms causes substantially less lying. Rand et al. (Forthcoming) show that intuition fosters

cooperation in a public good game, suggesting that we should observe more lying in the intuition treatment since it is beneficial to both parties. In contrast, intuition supports honesty at the cost of overall welfare in the present experiment. The importance of lying aversion relative to a concern for others' welfare is also illustrated by the fact that the participants who gave away a large share in the dictator game are much less likely not to lie in the sender-receiver game. Overall, the study therefore provides evidence of aversion to lying being a fundamental part of the human moral psychology, but more research is needed on how this motive interacts with other moral motives in different economic and non-economic environments.

People's aversion to lying is potentially of great importance for public policy. In particular, the effectiveness of the welfare state depends on truthful reporting of information both in the collection of taxes and in the distribution welfare benefits, and thus it is crucial for the optimal design of welfare policies to know when people lie.

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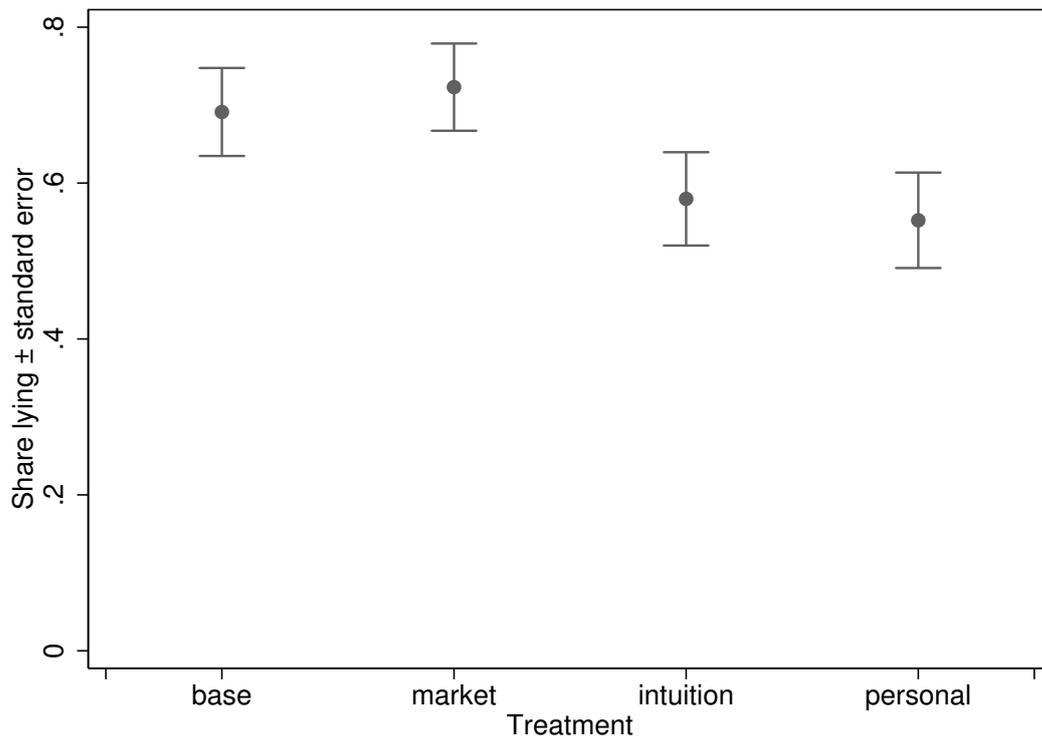


Figure 1: Share of participants lying

Note: The figure reports the share of participants who lied in each of the four treatments, with the corresponding standard errors.

Table 1: Summary statistics

	mean	sd
age	20.426	2.167
female	0.443	0.497
points on WAIS-IV test	21.778	2.424
Big-5 Agreeableness	0.618	0.396
Big-5 Conscientiousness	0.649	0.417
Big-5 Extraversion	0.362	0.534
Big-5 Neuroticism	-0.421	0.558
Big-5 Openness	0.176	0.513
share given	0.292	0.235
Observations	352	

Note: “age” (in years) and “female” (an indicator variable taking the value 1 if the participant is a female) are self-reported at the end of the experiment. The maximum score possible on WAIS-IV matrix reasoning test is 26 points. The personality measures are from the 44-item Big Five Inventory, and calculated using the “ipsatizing” method of John, Naumann, and Soto (2008). One participant (a receiver) did not provide data on the Big Five measures. “share given” is the share of 200 NOK that the participant gave to another random and anonymous participant in the dictator game in the experiment.

Table 2: Average treatment effects on lying (relative to base treatment).

	(1)	(2)	(3)	(4)	(5)	(6)
personal	-0.139 ⁺ (0.083)	-0.156 ⁺ (0.084)	-0.140 ⁺ (0.083)	-0.142 ⁺ (0.084)	-0.142 ⁺ (0.084)	-0.153 ⁺ (0.087)
intuition	-0.111 (0.082)	-0.118 (0.084)	-0.111 (0.083)	-0.112 (0.083)	-0.110 (0.084)	-0.115 (0.085)
market	0.032 (0.079)	0.045 (0.089)	0.036 (0.089)	0.035 (0.089)	0.037 (0.089)	0.048 (0.090)
share given		-0.329** (0.125)				-0.326** (0.126)
age			0.007 (0.013)			0.011 (0.012)
female			0.036 (0.060)			0.043 (0.069)
points on WAIS-IV test				0.000 (0.012)		0.001 (0.012)
Big-5 Agreeableness					-0.070 (0.078)	-0.050 (0.082)
Big-5 Conscientiousness					0.041 (0.071)	0.047 (0.080)
Big-5 Extraversion					0.022 (0.059)	0.003 (0.058)
Big-5 Neuroticism					0.005 (0.056)	-0.006 (0.064)
Big-5 Openness					-0.028 (0.060)	-0.012 (0.062)
Constant	0.691** (0.056)					
Observations	269	269	269	269	269	269

Standard errors in parentheses

⁺ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$

Note: The table reports average treatment effects on lying, where the dependent variable is an indicator variable taking the value 1 if the sender lied. Column (1) reports OLS results, columns (2)-(6) report logit marginal effects. “personal”, “intuition”, and “market” are indicator variables taking the value 1 if the participant was assigned to this treatment. “age” (in years) and “female” (an indicator variable taking the value 1 if the participant is a female) are self-reported at the end of the experiment. The maximum score possible on the WAIS-IV matrix reasoning test is 26 points. The personality measures are from the 44-item Big Five Inventory, and calculated using the “ipsatizing” method of John et al. (2008). “share given” is the share of 200 NOK that the participant gave to another random and anonymous participant in the dictator game in the experiment. Also included, but not reported, is an indicator for whether the participant took part in a session in February or August, 2012.

Table 3: Heterogeneous treatment effects on lying for males and females

	Personal	Intuition	Market
treated	-0.116 (0.123)	-0.265* (0.127)	0.038 (0.114)
treated interacted with female	-0.078 (0.183)	0.253 (0.184)	-0.006 (0.164)
female	-0.009 (0.140)	-0.085 (0.141)	-0.046 (0.126)
Treatment effect on females	-0.195 (0.133)	-0.012 (0.128)	0.032 (0.117)
Observations	135	137	133

Standard errors in parentheses

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Note: The table reports logit marginal effects on lying, where the dependent variable is an indicator variable taking the value 1 if the sender lied. We report separate regressions for each of the three treatments relative to base treatment. “treated” is an indicator variable taking the value 0 if the participant is assigned to the base treatment and the value 1 if the participant is assigned to the relevant alternative treatment. Also included in the regressions, but not reported, are the background variables: Age, female, points on the WAIS-IV matrix reasoning testability score, Big-5 personality measures, share given in the dictator game, and an indicator for whether the participant took part in a session conducted in February or August, 2012.

Appendix with screenshots for “When do we lie?”

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Bertil Tungodden

August 31, 2012

This document shows the screenshots from the experiment in “When do you lie?”. Since the experiment was conducted using a web platform, actual layout on participant’s computers could vary depending on the magnification (user adjustable) and screen resolutions.

Throughout the experiment there were no instructions read to the participants except an encouragement to follow the instructions on screen.

All treatments were allocated randomly within sessions.

1 Priming sequence

All participants were allocated to write one of four texts: “life in Bergen”, “personal”, “intuition” or “market”, Figures 1-4 shows screenshots of this.

2 Sending messages

After all participants had been working on their texts for 5 minutes, they were given the task of sending messages. Some of the those who had written “life in Bergen” texts were allocated to being receivers of the message, and they were told to await further instructions while the messages were sent.

There were separate screens for those in the personal (Figure 5) and in the non-personal treatments (Figure 6).

3 Receiving messages

When all the message senders had finished sending their messages, they were asked to report on their motivation (Figure 7).

Those allocated to receiving messages and making choices did so facing screenshots such as Figure 8 for the personal and 9 for the non-personal treatments.

When receivers had made their choices, they were also asked to report on their motivation (Figure 7).

Life in Bergen

In this part of the experiment, we would first like you to spend five minutes describing how it is to live in Bergen.

Please work carefully and continuously on the text. After five minutes, your text will automatically be submitted and you will be taken to the next screen.

Enter text here:

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Figure 1: Writing text, neutral treatment

Practical task

In this part of the experiment, the computer has rolled a 6-sided die and obtained the outcome 2. Please spend five minutes describing situations that are related to the number 2.

Please work carefully and continuously on the text. After five minutes, your text will automatically be submitted and you will be taken to the next screen.

Enter text here:

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Figure 2: Writing text, personal treatment

Trusted my intuition

In this part of the experiment, we would first like you to spend five minutes describing a situation where you benefitted from trusting your intuition.

Please work carefully and continuously on the text. After five minutes, your text will automatically be submitted and you will be taken to the next screen.

Enter text here:

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Figure 3: Writing text, intuition treatment

A great trade

In this part of the experiment, we would first like you to spend five minutes describing a situation where you benefitted from buying or selling a good or a service.

Please work carefully and continuously on the text. After five minutes, your text will automatically be submitted and you will be taken to the next screen.

Enter text here:

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Figure 4: Writing text, market treatment

Instructions

You are now randomly matched with another participant. Neither of you will know the identity of the other. The participant you are matched with will not be informed that the outcome of the die roll was 2. However, he or she will be told that you have been informed of the outcome of the die roll.

We now ask you to send a message to the other participant about the outcome of the roll of the die. There are six possible messages:

Possible messages:

- The outcome from the roll of the 6-sided die and the number I've written a text on is 1.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 2.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 3.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 4.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 5.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 6.

(This table is only an illustration, you choose which message to send on the next screen.)

Your message will be shown to the other participant, and then he or she will be asked to choose a number between 1 and 6. The other participant's choice will determine the payments in this part of the experiment.

- **A:** If he or she chooses the actual outcome of the roll of the dice, 2, then you will receive 20 and he or she will receive 20.
- **B:** If he or she chooses a number different from the actual outcome of the roll of the dice, you will receive 30 and he or she will receive 30.

Importantly, only you will be informed of the particular monetary values in A and B. However, the other participant will be told that you have been informed of the monetary values in A and B.

The other participant has been told that, if he or she chooses a different number than the number in your message, his or her payment will be reduced with 2 NOK.

At the end of the experiment, you will be informed of the outcome from this part of the experiment.

Please raise your hand if you have questions.

[Go to next page to send your message](#)

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Sending message

Please choose which message to send to the other participant:

- The outcome from the roll of the 6-sided die and the number I've written a text on is 1.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 2.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 3.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 4.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 5.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 6.

Possible messages:

[Send message](#)

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Figure 5: Instructions for sending message and actual message screen for the personal treatment

Instructions

You are now randomly matched with another participant. Neither of you will know the identity of the other.

The computer has rolled a 6-sided die, and obtained the outcome 5. The participant you are matched with will not be informed that the outcome of the die roll was 5. However, he or she will be told that you have been informed of the outcome of the die roll.

We now ask you to send a message to the other participant about the outcome of the roll of the dice. There are six possible messages:

Possible messages:

- The outcome from the roll of the 6-sided die is 1.
- The outcome from the roll of the 6-sided die is 2.
- The outcome from the roll of the 6-sided die is 3.
- The outcome from the roll of the 6-sided die is 4.
- The outcome from the roll of the 6-sided die is 5.
- The outcome from the roll of the 6-sided die is 6.

(This table is only an illustration, you choose which message to send on the next screen.)

Your message will be shown to the other participant, and then he or she will be asked to choose a number between 1 and 6. The other participant's choice will determine the payments in this part of the experiment.

- **A:** If he or she chooses the actual outcome of the roll of the dice, 5, then you will receive 20 and he or she will receive 20.
- **B:** If he or she chooses a number different from the actual outcome of the roll of the dice, you will receive 30 and he or she will receive 30.

Importantly, only you will be informed of the particular monetary values in A and B. However, the other participant will be told that you have been informed of the monetary values in A and B.

The other participant has been told that, if he or she chooses a different number than the number in your message, his or her payment will be reduced with 2 NOK.

At the end of the experiment, you will be informed of the outcome from this part of the experiment.

Please raise your hand if you have questions.

[Go to next page to send your message](#)

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Sending message

Please choose which message to send to the other participant:

- The outcome from the roll of the 6-sided die is 1.
- The outcome from the roll of the 6-sided die is 2.
- The outcome from the roll of the 6-sided die is 3.
- The outcome from the roll of the 6-sided die is 4.
- The outcome from the roll of the 6-sided die is 5.
- The outcome from the roll of the 6-sided die is 6.

Possible messages:

[Send message](#)

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Figure 6: Instructions for sending message and actual message screen for non-personal treatments

What was the motivation for your choice?

Please explain the motivation for your choice:

Enter text here:

Submit Query

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Figure 7: Screen for entering motivations

Instructions

In this part of the experiment, you are randomly matched with another participant. Neither of you will know the identity of the other. You will face a sequence of such situations, and in each case you are matched with a new participant. The situations are completely independent, so you should focus on each of them separately.

Before starting this part of the experiment, the computer has rolled a 6-sided die for the other participant. The participant you are matched with has been told about the outcome of the roll but we will not tell you about the outcome. The participant was also told to spend five minutes describing situations that are related to the number that was the outcome of his or her roll.

After being informed of the roll of the die, the other participant has sent a message to you. There are six possible messages:

Possible messages:

- The outcome from the roll of the 6-sided die and the number I've written a text on is 1.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 2.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 3.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 4.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 5.
- The outcome from the roll of the 6-sided die and the number I've written a text on is 6.

Your task is to choose a number between 1 and 6. The message you receive is the only information you will have regarding the roll of the die. Your choice of a number will determine the payments in this situation according to two different payment schemes, A and B, known only to the other participant.

If you choose the same number as the number that came up in the roll of the die, both of you will be paid according to the payment scheme A.

If you choose a number different than the number that came up in the roll of the die, both of you will be paid according to the payment scheme B.

Note: If you choose a **different** number than the **number in the message** of the other participant, your payment will be reduced with 2 NOK.

Please raise your hand if you have questions.

[Go to next page to make your first choice](#)

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Situation 1: Choose a number

In this situation, the other participant's message is:

Message: "The outcome from the roll of the 6-sided die and the number I've written a text on was 5".

Please make your choice of number:

The number I choose is:

[Submit choice](#)

Note: If you choose a **different** number than the **number in the message** of the other participant, your payment will be reduced with 2 NOK.

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Figure 8: Receiving a message and making a choice in the personal treatment

Instructions

In this part of the experiment, you are randomly matched with another participant. Neither of you will know the identity of the other. You will face a sequence of such situations, and in each case you are matched with a new participant. The situations are completely independent, so you should focus on each of them separately.

Before starting this part of the experiment, the computer has rolled a 6-sided die for the other participant. The participant you are matched with has been told about the outcome of the roll, but we will not tell you about the outcome.

After being informed of the roll of the die, the other participant has sent a message to you. There are six possible messages:

Possible messages:

- The outcome from the roll of the 6-sided die is 1.
- The outcome from the roll of the 6-sided die is 2.
- The outcome from the roll of the 6-sided die is 3.
- The outcome from the roll of the 6-sided die is 4.
- The outcome from the roll of the 6-sided die is 5.
- The outcome from the roll of the 6-sided die is 6.

Your task is to choose a number between 1 and 6. The message you receive is the only information you will have regarding the roll of the die. Your choice of a number will determine the payments in this situation according to two different payment schemes, A and B, known only to the other participant.

If you choose the same number as the number that came up in the roll of the die, both of you will be paid according to the payment scheme A.

If you choose a number different than the number that came up in the roll of the die, both of you will be paid according to the payment scheme B.

Note: If you choose a **different** number than **the number in the message** of the other participant, your payment will be reduced with 2 NOK. Please raise your hand if you have questions.

[Go to next page to make your first choice](#)

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Situation 1: Choose a number

In this situation, the other participant's message is:

Message: "The outcome from the roll of the 6-sided die was 5".

Please make your choice of number:

The number I choose is:

[Submit choice](#)

Note: If you choose a **different** number than **the number in the message** of the other participant, your payment will be reduced with 2 NOK.

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Figure 9: Receiving a message and making a choice in the non-personal treatments

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