Avoiding Lying: The Case of Delegated Deception[†]

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Abstract

People do not always lie, even when lying increases their monetary payoffs. Still, even when lying is aversive, can hiring someone to lie for you allow a person to avoid the disutility from lying, while at the same time ensuring higher payoffs? The current article investigates this empirical question - the possibility of delegated deception - through a laboratory experiment. The results indicate that a significant fraction of people employ an agent (to lie) even when they could lie themselves. Moreover, the likelihood of delegating to an agent depends on the incentives, with more people choosing to delegate when the lie hurts to a greater extent the person being lied to. Finally, analysis of gender differences in the tendency to use an agent revealed that that women are more likely to delegate to an agent compared to men, especially so when the harm inflicted by the lie is larger.

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"I don't think I've ever hired an illegal in my life." - Mitt Romney in the GOP Presidential Debates

"Massachusetts governor [Mitt Romney] never *directly* hired an illegal immigrant. But he did hire a landscaping company that employed illegal immigrants from Guatemala" USA Today, Oct 11, 2011

1 Introduction

In many economic interactions, such as selling a used car, honesty might not necessarily be the best policy, at least if the goal is to maximize monetary payoffs. In situations such as these, one is faced with the following choice: engage in deception and improve one's pecuniary benefits while reducing the other's payoffs, or tell the truth and forgo one's own benefits. In an empirical study of how people make this choice, Gneezy (2005) finds that people do not always lie even when lying increases one's own payoffs. And more interestingly, the choice of whether or not to engage in deception is sensitive to incentives, with people being more likely to lie if their own benefit is higher and/or other's loss is lower.[1]

The vast majority of extant economics literature focuses on settings where a person might undertake one of only two actions (for an interesting article that expands the action space, see Sanchez-Pages and Vorsatz, 2009). The moral one, where the person tells the truth; Or the immoral one, where the person tells a lie. But, at least in some situations, these two actions are not the only two available ones. For instance, while (most?) people may be averse to hiring an illegal immigrant to mow their lawn for less than the minimum wage, this does not automatically mean that they choose to hire only legal workers. An alternative course of action might be to hire an "agent" to act on your behalf, with the possibility that this person might engage in actions that you yourself would not do.[2]

A second and economically significant example is provided by software piracy in some countries. The International Intellectual Property Alliance, a U.S. coalition of film, software, music and publishing groups, claims that billions of dollars are lost each year due to software piracy. Recently,

[1] For discussion and evidence of the role of incentives in the propensity to engage in deception, see Gneezy, 2005; Dreber and Johannesson, 2008; Erat and Gneezy, 2012. For a study on other determinants of deception, see Lundquist, Ellingsen, Gribbe, and Johannesson (2009).

[2] I abstract away from the possibility that one can be caught, and consequently punished, if one employs illegal workers. Indeed, given that the chances of being caught employing an illegal immigrant is very low, especially so if you are not a large firm (or a politician running for high office!), it appears reasonable that fear of punishment may not be an important explanation for moral behavior.

some large software vendors have alleged that many of the computers sold through retail outlets in international markets are pre-loaded with pirated software (for instance, see Microsoft's lawsuit against Gome Electrical Appliance Holding and Beijing Chaoyang Buynow mall, Jan 10, 2012). With such pre-installed pirated software, consumers does not need to engage in the immoral act of obtaining a pirated software, but rely on the retailer to do this for them.[3]

The goal of this research is to empirically examine settings such as the ones above, where people can either choose between an immoral and moral action, or where they can delegate the authority to choose between these moral and immoral actions to an agent acting on their behalf. There are two streams of research that relate to the context of interest in this study.

First, a large body of research, employing the standard principal-agent framework, explains delegation as emerging from either differences in information, cost, ability, or from credibility and commitment power due to handing off the decision-making authority. Within this tradition, Fershtman, Judd, and Kalai (1991) offer an interesting model where principal, by selecting the appropriate (publicly observable) incentive scheme and delegating to an agent, modifies the incentives of the person playing the game (from her own) and consequently gains credibility. They go on to demonstrate that every pareto optimal outcome can be implemented as a subgame perfect equilibria by delegating the decision through the choice of appropriate incentive schemes. [4]

More recently, a smaller body of research suggests that delegation may serve other strategic goals, such as avoiding punishment. In one such study, Bartling and Fischbacher (2012) consider the allocation in a (modified) dictator game, and find that people may delegate the task of choosing the allocation to avoid punishment for unfair outcomes. Grossman and Oexl (2011) consider a similar argument, and offer some interesting evidence that the mere presence of the agent is sufficient to avoid punishment, even when the person by choosing the agent has necessarily eliminated the possibility of a fair outcome.

Hamman, Loewenstein, and Weber (2010) similarly find that people using agents to make allocations in a dictator game can obtain greater monetary payoffs, since these agents tend to be less

[3]Of course part of the reason why the "agent" might be more effective in obtaining pirated software possibly has to do informational or cost/ability advantages possessed by the agent.

[4]See also Fershtman and Kalai (1997) for a model that expands the type of permissible contracts and relaxes the assumption of observability of delegation, and still finds strategic (commitment) value from delegation. For more references in this principal-agent framework that examines the benefits of delegation, see Schelling (1980); Bolton and Dewatripont (2005). For applications to managerial decision making in firms that examine rationales for delegation, see Aghion and Tirole (1997); Fershtman (1985).

fair. Still, these and other studies - to the best of my knowledge - have employed dictator-game like experimental designs, and have interpreted (whichever) action result in inequitable allocations as "immoral" (for an alternate and perhaps surprising view that inequality may be the morally desirable outcome, see Simpson, 2009). The current study adds to this literature by taking an action that is plausibly immoral (per se) - deception - and examining the choice between delegating this immoral act or engaging in it oneself.[5]

Second, the current study is also related to a growing stream of research that examines deception and its determinants. Within this stream, multiple studies have replicated the original Gneezy (2005) finding that people are averse to lying, and fail to lie even when the lie increases their monetary payoffs. An explanation proposed for this "lying aversion" is the presence of a (psychic) lying cost, that creates disutility for people engaging in deception. Consistent with this explanation, past research has also found that incentives affect the propensity to lie whereby an increase in monetary payoffs from deception does indeed lead to more people lying.

In the setting that is my empirical concern, a cost of lying can plausibly make a person likely to engage an agent to undertake the deception for them. Thus, delegation can possibly help to minimize a person's lying cost, since the lie was not spoken by the person but by her agent.[6] In addition, the agent might be able to "diffuse the responsibility" for a lie, and consequently feel less disutility from speaking it, since he was "merely" acting on another's behalf[7]. These arguments above suggest that, all else being equal, a person may find it beneficial to avoid lying by delegating deception to the agent .

[5]Whether or not deception is immoral is admittedly a debatable, and much debated, point. For instance, the Kantian view (of categorial impertive) would argue that lying is immoral per se, whereas the utilitarian view (Bentham, 1891) would necessarily make the consequence of the lie crucial in characterizing the morality of a lie. Still for the purposes of the paper, and consistent with empirical evidence that an aversion to lying appears to exist independent of consequences (for instance, see Erat and Gneezy, 2012, for evidence of aversion to even tell pareto improving lies), I shall assume that people do perceive deception to be an immoral act.

[6]Without the first action (delegation), the second action (lying) is not possible. This line of reasoning might suggest that the agent cannot be the only person who is held responsible (for instance, most societies do assign responsibility and punishment to someone who while not engaging in an illegal act, was complicit in one). Still, one could also argue that the agent had a choice - whether or not to lie - and consequently, the immoral action of lying is solely the agent's responsibility. Given these two plausible "principles," people may incur lower lying costs by adjusting their abstract norms (by choosing the more "convenient" principle) to fit the choices they wish to make (see Rustichini and Villeval, 2012, for evidence that people adjust their abstract norms on fairness of allocations; see also see also, Conrads, Irlenbusch, Rilke, and Walkowitz, 2013; Danilov, Biemann, Kring, and Sliwka, 2013, for some evidence that team incentives, by helping justify dishonest acts, might increase overall dishonesty)

[7]For instance, see Bartling and Fischbacher (2012). See also Fershtman and Gneezy (2001) for some interesting evidence that an agent, acting for a proposer, is more likely to make tougher offers in an utimatum game. And more recently, Gino, Ayal, and Ariely (2013) find that cheating is more frequent when others (besides oneself) can benefit from the cheating, and when the number of beneficiaries of wrongdoing increases.

The experimental results (described in more detail in the next sections) reveal that a significant fraction of people employ an agent (to lie) even when they could lie themselves. Moreover, the likelihood of delegating to an agent depends on the incentives, with more people choosing to delegate when the lie hurts to a greater extent the person being lied to. Finally, I also examined gender differences in the tendency to use an agent, and found that women are more likely to delegate to an agent compared to men, especially so when the harm caused by the lie is larger.

2 Experimental Design and Procedure

Sender-Agent-Receiver Game

I modify the experimental design used by Erat and Gneezy (2012) to include the possibility of employing an agent. In the experiment, an individual acting in the role of a "sender" is paired with one individual acting in the role of "agent" and another acting in the role of "receiver." A 6-sided die was rolled, and the outcome obtained, 2, was communicated to both the sender and the agent, but not to the receiver.

The sender's task was to decide whether to send a message to the receiver or whether to delegate the task of sending the message to the subject acting as his/her agent. The six possible messages the sender or his/her agent could send to the receiver were "Choosing i will earn you more money than choosing any other number" where $i \in \{1, 2, 3, 4, 5, 6\}$. The sender is informed that the payments in the experiment will depend on a choice made by the receiver. Moreover, the sender is informed that only he/she and the agent has been informed of the outcome and not the receiver.

There are two payment options A and B, with payment option B being better (worse) for the sender and agent (receiver) relative to payment option A; the actual payoffs used in the experiment are described below. The sender is told that only he/she and the agent have been informed of the monetary value connected to these options, and that the receiver will not know these values. The sender is informed that the receiver, after looking at the message sent to him/her, will be asked to choose a number from the set $\{1, 2, 3, 4, 5, 6\}$. If this chosen number is the real outcome of the roll of the die, 2, payment option A will be implemented. Otherwise, payment option B will be implemented.

Next, the message from the sender (if the sender chose to send the message himself/herself) or

his/her agent (if the sender chose to delegate the agent to send a message) is shown to the receiver. Then, the receiver is asked to select a number from the set $\{1, 2, 3, 4, 5, 6\}$. This choice determines which of the two possible payoff options, A or B, gets implemented (the receiver is not told what these payoffs are). She is told, just as the sender was, that if the receiver chose the actual outcome of the roll of die, payoff option A is implemented, and for any other choice, payoff option B is implemented.

Procedure

This article, in a between-subject design, uses two different treatments. In both the treatments T[-2] and T[-6], the payoff option A involved all the participants receiving \$10. In treatment T[-2], the payoff option B involved sender and his/her agent each receiving \$15 and the receiver being paid \$8. And, in treatment T[-6], the payoff option B involved sender and his/her agent each receiving \$15 and the receiver being paid \$4. As may be observed, the two treatments only differ in the relative loss that the receiver incurs from choosing a number other than actual outcome of the roll of dice - specifically, in treatment T[-2] the receiver's payoff reduces by \$2 (from \$10 to \$8), and in treatment T[-6] the receiver's payoff reduces by \$6 (from \$10 to \$4).

The experiment was run on computers in a laboratory setting. The 263 senders who participated were undergraduate students taking introductory courses in management, who came to the lab for course credit. The subjects in addition to completing the experiment also reported their gender. Full instructions are given in the Appendix. The experimental procedure involved choosing one out of twenty senders who were then paired with an agent and receiver. Specifically, the sender's part of the experiment was run over over 3 days (from March 12, 2012, to March 14, 2012), and all the 263 subjects who came to the lab on those three days were asked to play the role of the sender. Subsequently, the randomly chosen senders were paired with agents and receivers, and the agent's and receiver's part of the experiment was run the subsequent week.

Before discussing the results, note that Hamman, Loewenstein, and Weber (2010) propose that people use agents to avoid taking responsibility for immoral outcomes, and specifically for inequitable outcomes in a dictator game. They contend that this rationale for delegation exists even when the same unfair outcome (in the dictator game) can be obtained by oneself (or even when there is no possibility of punishment like in Bartling and Fischbacher, 2012). Their experiment shows that

	Fraction of senders using an agent
T[-2]	33/132 (25.0%)
T[-6]	45/131 (34.3%)

Table 1: Fraction of senders who use an agent.

people do sometimes delegate the task of making allocations in a dictator game, even when they can achieve the same allocations themselves. [8]

In the experiment reported in the current article, the sender has no greater ability compared to the agent in guaranteeing a given outcome. Moreover, since a randomly selected agent might have different preferences compared to the sender, a rational sender who only has preferences over the outcomes (payoff option A vs. payoff option B) should never delegate the authority to send a message to an agent. However, if the act of lying does result in a disutility, then the sender may find it useful to delegate to the agent to avoid this lying cost.

3 Results

The fraction of senders who chose to use the agent to send a message is given in Table 1.

Result 1: A large fraction of people (30%) employ an agent to send a message.

25% senders in T[-2], and 34% senders in T[-6], use the agent to send the message to the receiver. To better understand why the senders delegate to the agent, I had also incentivized the senders to guess the fraction of agents who would send the truthful message. The results show that the average sender believes that fewer than 30% of agents will speak the truth.[9] The senders who are delegating in the experiment are choosing to delegate with the expectation that the agent will (most likely) lie. Moreover, a Wilcoxon test showed that the median guess of the fraction of agents who tell the

[8] While supporting the basic argument that delegation may occur (to avoid responsibility) even when one can guarantee the same outcomes, it is interesting to note that in Hamman, Loewenstein, and Weber (2010) design, the principals in first 8 rounds had no choice but to delegate to an agent, and then in the final 4 rounds were given a choice of making the decision themselves or delegating as before. Hence, it cannot be ruled out that status-quo bias might have played some role in their finding that 40% of people choose to delegate in the last 4 rounds (and the remaining make the decision themselves). Indeed, consistent with this possibility, it appears that the fraction of people who choose to delegate in their experiment reduces from 43% in round 8 to 33% in round 12 (Table 4, page 1835, Hamman et al., 2010).

[9] The distribution of the senders' guesses were heavily skewed to the left. For instance, 38% of senders believe that no more than 20% of agents will speak truthfully, and 50% of senders believe that no more than 30% of agents will speak truthfully.

truth among those senders who chose to delegate is not statistically different from the median guess among those senders who choose not to delegate (35% for senders who chose delegate vs. 30% for senders who chose not to delegate, W=7614, p=0.47). Hence, the first result (together with the finding that most senders expect the agent to lie) indicates that agents might be employed to avoid undertaking immoral acts oneself.

How do the incentives affect this propensity to delegate? One obvious factor affecting the incentives is the harm that the lie does to the receiver. The next result discusses how the loss incurred by the receiver affects the propensity to employ an agent.

Result 2: People are *more* likely to use an agent when the lie (that the agent may undertake) results in *larger* harm to others.

Comparing the propensity to delegate, I find that people are more likely to use an agent in T[-6] (34%) compared to T[-2] (25%) (z=1.66, p=0.05)[10]. Specifically, the propensity to delegate is larger when the harm done to others is larger. This result offers evidence consistent with the interpretation that people wish to avoid feeling bad for taking immoral actions, and consequently delegate the action. Given our interpretation, it is also of interest to examine whether there are any gender differences in the propensity to delegate for the following reason: past research has found that women are less likely to lie, and possibly have a higher lying cost (Dreber and Johannesson, 2008). If this is indeed the case, then one should expect women to be more willing to delegate to an agent since they have a greater incentive to avoid the lying cost. The next result confirms this.

Result 3: Women are *more* likely to use an agent compared to men.

Figure 1 shows the fraction of men and women who delegate in each of the two conditions T[-2] and T[-6]. As may be observed, comparing within T[-6], women are significantly more likely to use an agent compared to men (42% vs. 26%, z=1.97, p=0.02); and comparing within T[-2], though the difference is not statistically significant, women are more likely to use an agent compared to men (28.6% vs 21.7%, z=0.90, p=0.18). Thus, consistent past literature that suggests that women have a higher cost from deceit, women are more likely to delegate compared to men, especially so when the harm caused by the lie is larger (T[-6]). While gender differences in lying costs underlies my explanation, note that the gender difference in deception may also arise from alternate mechanisms,

[10]The p-values are calculated from a one-tailed test of the equality of proportions, using normal approximation to the binomial distribution.

Variable	*df*	Parameter estimate	Error	Wald χ^2	Pr $> \chi^2$
Intercept	1	-1.50	0.45	10.68	0.001
Treatment(T[-6] = 1)	1	0.46	0.27	2.76	0.10
Gender(Female = 1)	1	0.56	0.27	4.23	0.04

Table 2: Logistic regression for likelihood of using the agent
Notes: Treatments T[-2] and T[-6]. *df*, degree of freedom.

such as preference for avoiding making decisions for others.[11] Table 2 gives the results of a logistic regression examining the propensity to use an agent as a function of the treatment and of gender.

Since this difference could also emerge from different beliefs that men and women senders might hold about the agent's actions, I also tested for any differences among men and women sender's beliefs. Specifically, a Wilcoxon test showed that the median guess of the fraction agents who tell the truth among men senders is not significantly different from the median guess among women senders (35% for men vs. 30% for women, W=8245, p=0.53). Thus, both men and women senders hold similar beliefs that the vast majority of agents are very likely to lie.

Figure 1 also suggests the possibility that the marginal effect of harm on delegation (Result 2) might be distinct for men and women.[12] Separate analysis of the data, based on gender, does seem to suggest that women are sensitive to the harm and increase their extent of delegation, whereas men are relatively insensitive to the harm in deciding the extent of delegation.[13]

Finally, since I do not have many subjects in the role of agents in the experiment, I cannot speak conclusively about the agent's propensity to lie. Specifically, consistent with the instructions for the senders, for each of the 263 senders, I randomly generated a number between 1 and 20, and paired the sender with an agent and a receiver only if the generated number was 1. This procedure resulted in selecting 16 senders, and corresponding 16 agents.[14] All 16 agents (9 in one condition, and 7 in the other condition) lied in the experiment. Thus, it appears plausible that most agents, consistent

[11] I thank one of the reviewers for suggesting this possibility.

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[13] I explored this possibility more formally through a logistic regression with an interaction term included, but failed to find any statistically significant differences. More details are given in the online Appendix.

While beyond the scope of current research, the findings from the current study (that women are more likely to delegate, whereas men are somewhat more likely to lie) suggests a possible interesting selection effect - specifically, as suggested by Sobel (2013) (experiment 6), is it the case that those who are averse to lying self-select out of sending a message and instead choose someone else to their dirty work for them?

[14] Note also that I have 16 receivers (in addition to the 16 agents, and the 16 randomly chosen senders). The results about receiver choices show that all but one of the receivers chose to follow the received message.

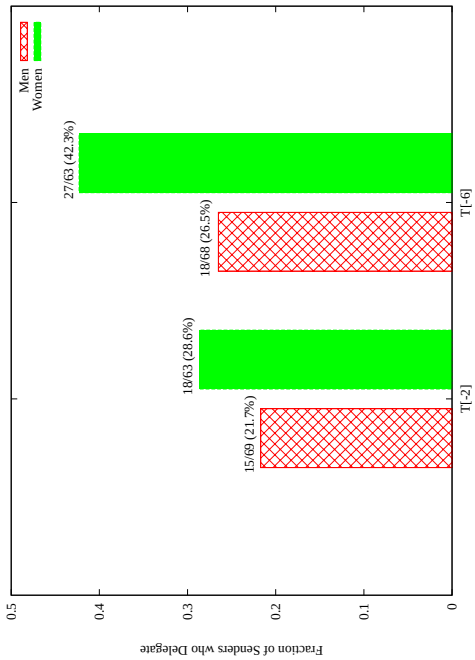

Figure 1: Fraction of senders who use an agent

with the senders' beliefs, are likely to tell a lie to the receiver. This supports the argument that the agent by "merely" acting on the sender's behalf "diffuses her responsibility" thus making lying easier (for instance, see Bartling and Fischbacher, 2012).

4 Conclusions

Do people delegate the authority to take immoral actions to their agents to avoid taking direct responsibility? To answer this question, and to understand how the consequences of the immoral action affect this propensity to delegate to an agent, I conducted a laboratory experiment where a sender could lie to a receiver, or could delegate to an agent the task of sending a message to the receiver, deceptive or otherwise.

The main empirical finding is that people, even when they can take the exact same actions and obtain the exact same outcomes, choose to delegate to the agent the authority to send the message to the receiver. Moreover, I find that the propensity to delegate is higher when lie results in greater harm to the receiver. Thus, when the lie harms the receiver to a greater degree, people are persumably more eager to avoid responsibility and consequently more willing to delegate to their

agent. Finally, consistent with previous empirical findings of gender differences in social preferences and on lying aversion, I also find that women are more likely to use an agent.

References

Aghion, Philippe, Jean Tirole. 1997. Formal and real authority in organizations. *Journal of Political Economy* **105**(1) pp. 1–29.

Bartling, Bjorn, Urs Fischbacher. 2012. Shifting the blame: On delegation and responsibility. *The Review of Economic Studies* **79**(1) 67–87.

Bentham, J. 1891. *A fragment on government*. Clarendon Press. URL `http://books.google.com/books?id=jJUqAAAAYAAJ`.

Bolton, P., M. Dewatripont. 2005. *Contract Theory*. MIT Press.

Conrads, Julian, Bernd Irlenbusch, Rainer Michael Rilke, Gari Walkowitz. 2013. Lying and team incentives. *Journal of Economic Psychology* **34**(0) 1 – 7.

Danilov, Anastasia, Torsten Biemann, Thorn Kring, Dirk Sliwka. 2013. The dark side of team incentives:experimental evidence on advice quality from financial service professionals. *Journal of Economic Behavior and Organization* .

Dreber, Anna, Magnus Johannesson. 2008. Gender differences in deception. *Economics Letters* **99**(1) 197 – 199.

Erat, Sanjiv, Uri Gneezy. 2012. White lies. *Management Science* **58**(4) 723–733.

Fershtman, Chaim. 1985. Managerial incentives as a strategic variable in duopolistic environment. *International Journal of Industrial Organization* **3**(2) 245 – 253.

Fershtman, Chaim, Uri Gneezy. 2001. Strategic delegation: An experiment. *The RAND Journal of Economics* **32**(2) pp. 352–368.

Fershtman, Chaim, Kenneth L. Judd, Ehud Kalai. 1991. Observable contracts: Strategic delegation and cooperation. *International Economic Review* **32**(3) pp. 551–559.

Fershtman, Chaim, Ehud Kalai. 1997. Unobserved delegation. *International Economic Review* **38**(4) pp. 763–774.

Gino, Francesca, Shahar Ayal, Dan Ariely. 2013. Self-serving altruism? the lure of unethical actions that benefit others. *Journal of Economic Behavior and Organization* .

Gneezy, Uri. 2005. Deception: The role of consequences. *American Economic Review* **95**(1) 384–394.

Grossman, Zachary, Regine Oexl. 2011. Delegating to a powerless intermediary: Does it reduce punishment? Tech. rep., Department of Economics, UC Santa Barbara.

Hamman, John R., George Loewenstein, Roberto A. Weber. 2010. Self-interest through delegation: An additional rationale for the principal-agent relationship. *American Economic Review* **100**(4) 1826–46.

Lundquist, Tobias, Tore Ellingsen, Erik Gribbe, Magnus Johannesson. 2009. The aversion to lying. *Journal of Economic Behavior and Organization* **70** 81 – 92.

Rustichini, Aldo, Marie-Claire Villeval. 2012. Moral hypocrisy, power and social preferences. Tech. rep., SSRN.

Sanchez-Pages, Santiago, Marc Vorsatz. 2009. Enjoy the silence: an experiment on truth-telling. *Experimental Economics* **12** 220–241.

Schelling, T.C. 1980. *The Strategy of Conflict*. Harvard University Press.

Simpson, Brian. 2009. Wealth and income inequality: An economic and ethical analysis. *Journal of Business Ethics* **89** 525–538.

Sobel, Joel. 2013. Ten possible experiments on communication and deception. *Journal of Economic Behavior and Organization* .

Appendix: Experimental Instructions

INSTRUCTIONS FOR PLAYER P

Welcome to our short experiment. Please read these instructions carefully. You may earn a considerable sum of money, depending on the decisions you make in the experiment. We will randomly choose 1 participant out of 20 and pay this person next week. The rest of the instructions describe what the procedure will be should you be chosen.

You are player P. You will be matched randomly with two other participants who are players Q and R in this experiment. None of you will know the identity of the others.

Before starting this experiment, we have rolled a 6-sided die, and obtained the outcome 2. Both you and Player Q have been informed that the outcome of die roll was 2, but player R will not be informed that the outcome of the die roll was 2. However, player R will be told that the other players have been informed the outcome of the die roll.

At the end of the experiment, we will ask player R, to choose a number between 1 and 6. The choice of the number by the player R will determine the actual payment option below that will be paid in the experiment.

Payment option A: If player R chooses the actual outcome of the roll of the dice, 2, then all the players (you, player Q, and player R) will each receive $10.

Payment option B: If player R chooses a number different than the actual outcome, then you and player Q will each receive a $15, and player R will receive **$8/$4**.

We now ask you if you want to appoint player Q as your "agent" and have him/her send a message to player R prior to his/her choosing a number between 1 and 6, or if you want to send a message yourself to player R.

You or player Q acting as your agent may send one of the six possible messages below to player R prior to his/her choosing a number between 1 and 6.

Message 1: "Choosing 1 will earn you more money than choosing any other number"

Message 2: "Choosing 2 will earn you more money than choosing any other number"

Message 3: "Choosing 3 will earn you more money than choosing any other number"

Message 4: "Choosing 4 will earn you more money than choosing any other number"

Message 5: "Choosing 5 will earn you more money than choosing any other number"

Message 6: "Choosing 6 will earn you more money than choosing any other number"

Finally, only you and player Q will be informed of the particular monetary value connected to each message. Player R will not be informed of these monetary values. However, he or she will be told that both you and player Q have been informed of the monetary value connected to each message. Do you wish to

(A) Choose player Q to act as your agent and send a message to player R, or

(B) Send a message to player R yourself

[*If (B) is clicked, then the following question is shown immediately*] The message I will send to player R is

"Choosing _____ will earn you more money than choosing any other number"

[*On Next Page*]

We also want you to guess what fraction of participants playing the role of the "agent" player Q in this experiment will send to player R the message below. If your guess is accurate to within 5% of the actual fraction of player Qs' sending the message, you will be paid an additional $5.

_____% "Choosing 2 will earn you more money than choosing any other number"

INSTRUCTIONS FOR PLAYER Q

Welcome to our short experiment. Please read these instructions carefully. You may earn a considerable sum of money, depending on the decisions you make in the experiment.

You are player Q. You will be matched randomly with two other participants who are players P and R in this experiment. None of you will know the identity of the others.

Before starting this experiment, we have rolled a 6-sided die, and obtained the outcome 2. Both you and Player P have been informed that the outcome of die roll was 2, but player R will not be informed that the outcome of the die roll was 2. However, player R will be told that the other players have been informed the outcome of the die roll.

At the end of the experiment, we will ask player R, to choose a number between 1 and 6. The choice of the number by the player R will determine the actual payment option below that will be

paid in the experiment.

Payment option A: If player R chooses the actual outcome of the roll of the dice, 2, then all the players (you, player P, and player R) will each receive $10.

Payment option B: If player R chooses a number different than the actual outcome, then you and player P will each receive a $15, and player R will receive **$8/$4**.

We have asked player P if he/she wants to appoint you as his/her "agent" and have you send a message to player R prior to his/her choosing a number between 1 and 6, or if player P wants to send a message to player R by himself/herself.

Player P or you acting as player P's agent may send one of the six possible messages below to player R prior to his/her choosing a number between 1 and 6.

Message 1: "Choosing 1 will earn you more money than choosing any other number"

Message 2: "Choosing 2 will earn you more money than choosing any other number"

Message 3: "Choosing 3 will earn you more money than choosing any other number"

Message 4: "Choosing 4 will earn you more money than choosing any other number"

Message 5: "Choosing 5 will earn you more money than choosing any other number"

Message 6: "Choosing 6 will earn you more money than choosing any other number"

Finally, only you and player P will be informed of the particular monetary value connected to each message. Player R will not be informed of these monetary values. However, he or she will be told that both you and player P have been informed of the monetary value connected to each message.

If player P chooses me as her agent, then I wish to send the following message to player Q is

"Choosing _____ will earn you more money than choosing any other number"

INSTRUCTIONS FOR PLAYER R

Welcome to our short experiment. Please read these instructions carefully. You may earn a considerable sum of money, depending on the decisions you make in the experiment.

You are player R. You will be matched randomly with two other participants who are players P and Q in this experiment. None of you will know the identity of the others.

Before starting this experiment, we have rolled a 6-sided die, and told the outcome of it to the other participants (player P and Q), but we are not going to tell it to you.

After being informed of the roll of the die, player P was asked to choose between sending a message to you himself/herself, or asking player Q to send a message to you. The 6 possible messages they could send you are:

Message 1: "Choosing 1 will earn you more money than choosing any other number"

Message 2: "Choosing 2 will earn you more money than choosing any other number"

Message 3: "Choosing 3 will earn you more money than choosing any other number"

Message 4: "Choosing 4 will earn you more money than choosing any other number"

Message 5: "Choosing 5 will earn you more money than choosing any other number"

Message 6: "Choosing 6 will earn you more money than choosing any other number"

The message one of them sent is:

Message : "Choosing 1/2/3/4/5/6 will earn you more money than choosing any other number"

Now we ask you to choose a number between 1 and 6. The message you received is the only information you will have regarding the roll of the die. Your choice of a number will determine the payments in the experiment according to two different options (option A and option B), known only to the other participants.

If you will choose the same number as the number that came up in the roll of the die, the participants will be paid according to option A. If you will choose a number different than the actual number, then participants will be paid according to option B.

The number I choose is: _____