Lying aversion and prosocial behaviour

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Abstract

The focus of this paper is the moral conflict between lying aversion and prosociality. What does telling a white lie signal about a person’s prosocial tendencies? How does believing a possibly untruthful message signal about a listener’s prosocial tendencies? To answer these questions, we conducted a $2 \times 3$ experiment. In the first stage we measured altruistic tendencies using a Dictator Game and cooperative tendencies using a Prisoner’s dilemma. In the second stage, we used a sender-receiver game to measure aversion to telling a Pareto white lie (i.e., a lie that helps both the liar and the listener), aversion to telling an altruistic white lie (i.e., a lie that helps the listener at the expense of the liar), and skepticism towards believing a possibly untruthful message. We found three major results: (i) both altruism and cooperation are positively correlated with aversion to telling a Pareto white lie; (ii) neither altruism nor cooperation are significantly correlated with aversion to telling an altruistic white lie; (iii) believing a possibly untruthful message sent by an anonymous stranger is positively correlated with cooperation, but not with altruism. Our results shed light on the relation between prosociality, truth-telling, and trust in others’ tendencies to tell the truth. In particular, the first two findings suggest that a significant proportion of people have non-distributional notions of what is the right thing to do: irrespective of the economic consequences, they tell the truth, they cooperate, they share their money. Interestingly, for these people, telling the truth is an even stronger moral motive than prosociality.

Keywords: lying-aversion, white lies, cooperation, altruism, pro-sociality, moral dilemmas.
1 Introduction

Moral decision-making in communication often concerns the choice whether to tell the truth or to deceive. Whilst it is generally agreed that it is bad to tell lies that increase your benefit at the expense of that of another person (black lies), moral philosophers have long argued about if and when telling a lie that increases the benefit of another person (white lie) is morally acceptable. We find Socrates pointing out to one of his interlocutors in Plato’s Republic that, “when any of our so-called friends are attempting, through madness or ignorance, to do something bad, isn’t it a useful drug for preventing them?” - suggesting that, given the circumstances, deception might be the ‘good’ thing to do (Plato, 1997). At the other end of the spectrum we find Immanuel Kant, for whom good intentions or consequences cannot justify an act of lying. For Kant, telling even a white lie is “by its mere form a crime of a human being against his own person and a worthlessness that must make him contemptible in his own eyes.” (Kant, 1996).

This raises the question whether prosocial agents would tell such ‘useful’ lies, or condemn them, as Kant did. Prosocial behaviour, that is, behaviour intended to benefit other people or society as a whole, is widely considered as the right course of action in situations in which there is a conflict between one’s own benefit and that of others. The Golden Rule, which encapsulates the essence of prosociality, is indeed “found in some form in almost every ethical tradition” (Blackburn, 2003). Thus, a prosocial person, when facing the decision of whether to tell a white lie or not may experience a conflict between two diverging moral dictates, one pushing towards lying for the benefit of others and the other pushing towards telling the truth regardless of circumstance.

Since most human interaction revolves around communication and involves some degree of prosociality, understanding how this conflict is resolved is not only interesting from the theoretical point of view of moral philosophy, but also from a more practical point of view. For instance, taking verbatim an example from Erat and Gneezy (2012): “should a supervisor give truthful feedback to a poorly performing employee, even when such truthful feedback has the potential to reduce the employee’s confidence and future performance?” What does telling a white lie signal about the supervisor’s prosocial tendencies? What does believing a lie signal about the employee’s prosocial tendencies?

The focus of the present paper is on this type of questions and, more generally, the moral conflict between lying aversion and prosocial behaviour.

To measure prosocial tendencies and aversion to telling white lies we build on previous studies in behavioural economics, which place economic games into experimental settings. Specifically, the Dictator Game (DG), due to its setup, has proven useful in measuring altruistic proclivities in recruited subjects. In a standard DG one player (the dictator) is given an initial endowment and is asked to decide how much of it, if any, to transfer to a passive player (the recipient), who is given nothing. The anonymity and confidentiality of decisions are ensured to rule out incentives (such as reputation) to share their endowment with the recipient. Although the theory of homo œconomicus predicts that dictators keep the whole endowment for themselves, research has shown that a significant proportion of dictators allocate a non-trivial share to recipients (Camerer 2003; Engel 2011; Forsythe, Horowitz, Savin and Sefton, 1994; Kahneman, Knetsch and Thaler, 1986).

Akin to the manner in which the DG is used in research as the paradigmatic game with which to investigate altruism, extensive use has been made of the Prisoner’s Dilemma (PD) in experimental settings in order to investigate cooperative behaviour in agents. In the standard one-shot two-player PD, both players can either cooperate or defect. If a player cooperates, he pays $c$ and bestows $b > c$ on the other player while, if he defects, he pays 0. Clearly homo œconomicus would defect in any case since, irrespective of the strategy of the other, the optimal strategy is to give 0. Yet in day-to-day life people often do cooperate and, perhaps unsurprisingly, research has shown that even in anonymous one-shot PD games a significant percentage of people choose to cooperate (see, e.g., Rapoport, 1965).
More recently, behavioural scientists have delved into choices people make regarding deception in different circumstances and under different conditions. Unlike cooperation and altruism, lying aversion is not measured by a unique and standard economic game and (at least) three different models have been put forward (Gneezy, Rockenbach and Serra-Garcia, 2013). However, irrespective of the model used, findings all point to the same direction: while the classic approach in economics assumes that people are selfish and that lying in itself does not involve any cost, accumulating evidence suggests that a significant amount of people are lie-averse in economic and social interactions (Abelar, Becker and Falk, 2014; Cappelen, Sørensen and Tungodden 2013; Erat and Gneezy, 2012; Gneezy, 2005; Gneezy, Rockenbach and Serra-Garcia, 2013; Hurkens and Kartik, 2009; Lundquist, Ellingsen, Gribbe and Johannesson, 2009).

However, with one sole exception, none of these studies have investigated the relation between prosocial behaviour and lying aversion. Our work is, indeed, reminiscent of Cappelen, Sørensen and Tungodden (2013), which explores the correlation between altruism in the DG and aversion to telling a Pareto white lie (PWL), that is, a lie that increases the benefits of both the liar and the listener. They provide evidence that telling a Pareto white lie is negatively correlated with DG donations, suggesting that lying aversion is a stronger moral motive than inequity aversion. Although this result represents a good starting point, more research is needed to develop a better understanding of the relation between aversion to telling a white lie and prosocial behaviour. First of all, most everyday situations are better modelled by a PD, rather than a DG. Since altruism in the DG and cooperation in the PD are different behaviours (virtually all altruistic people cooperate, but the converse does not hold - see Caprarol, Jordan, Rand, 2014), it is also important to investigate the correlation between cooperation in the PD and aversion to telling a white lie. Second, many white lies are not Pareto optimal, but involve a cost for the liar (altruistic white lies, AWL). Thus, it is important to go beyond Pareto white lies and explore also the correlation between prosocial behaviour and altruistic white lies.

To fill this gap, we implemented a 2x3 experiment, in which subjects play a two-stage game. In the first stage they are assigned to play either the DG or the PD; in the second stage they are assigned to a Deception Game in which they have the opportunity to tell either a Pareto white lie, or an altruistic white lie, or choose whether to believe a possibly untruthful message.

We refer the reader to the next section for more details about the experimental design and to the Results section for a detailed description of the results. Here we anticipate that we have found evidence of three major results: (i) both altruism in the DG and cooperation in the PD are positively correlated with aversion to telling a Pareto white lie; (ii) neither altruism in the DG nor cooperation in the PD are significantly correlated with aversion to telling an altruistic white lie; (iii) believing a potentially untruthful message sent by an anonymous stranger is positively correlated with cooperation in the PD, but not with altruism in the DG.

2 Experimental design and procedure

We set up a two-stage experiment in which we first collect data on participants’ prosocial preferences; followed by data regarding their behaviour in games involving deception. In the first stage of the experiment, the players were randomly assigned to either the DG or the PD. In the second stage, the former DG-participants and PD-participants were directed to one of two variations on the Deception Game, based on Erat and Gneezy (2012), in one of three possible roles detailed below.

Additionally, a wide-ranging set of demographic questions were asked after the games had been played, including questions regarding age; gender; marital status; political views; religious beliefs; mood that day; sexual orientation and degree of skepticism as to the reality of the experiment. Participants were also asked whether they had taken part in similar experiments before. Full details are reported in Appendix A.
2.1 Stage 1: Measure of pro-sociality

In the first stage of the game, all participants were randomly assigned to either a one-shot anonymous Dictator Game (DG) or a one-shot anonymous Prisoner’s Dilemma (PD) to assess the extent of their altruism toward, or cooperation with, unrelated individuals.

In the DG, dictators were given an initial endowment of $0.20 and were asked to decide how much money, if any, to transfer to a recipient, who was given nothing. Each dictator was informed that the recipient they were matched with would have no active role and would only receive the amount of money the dictator decides to give. In the PD, participants were given an initial endowment of $0.10 and were asked to decide whether to transfer the $0.10 to the other participant (cooperate) or not (defect). Each time a participant transfers their $0.10, the other participant earns $0.20. Each participant was informed that the participant they were matched with would be facing the same decision problem.

We deliberately chose to use the word "transfer", rather than “give”, “cooperate”, or similar words, in order to minimise possible framing effects caused by the moral weight associated with names of the strategies.

After having been informed about the set-up of the game, participants were required to answer comprehension questions to ensure they understood the games. If a participant failed to answer one of these questions correctly, they were directed to the end of the survey without payment.

2.2 Stage 2: Measure of lying-aversion

In the second stage of the experiment, participants played a Deception Game introduced in Erat and Gneezy (2012) with Pareto White Lies (PWL) and Altruistic White Lies (AWL) treatments. The participants were randomly assigned to one of the following three conditions: either they were senders in a Deception Game with an AWL condition or with a PWL condition, or they were receivers (receivers in the AWL condition and those in the PWL condition have the same experimental instructions). As in Erat and Gneezy (2012), two players are paired, acting in the role of sender and receiver, respectively. Before the start of the game, each sender was randomly assigned to group $i$, where $i \in \{1, 2, 3, 4, 5, 6\}$. The group allocation was communicated only to the sender. The sender was then asked to direct a message to the receiver from a list of six possible messages. The six possible messages are “I have been assigned to group $i$”. The sender was told that their message would be shown to the other participant, who would then be asked to choose a group number between 1 and 6. Senders were informed that the choice of the group number by the other participant would determine the payments in the experiment. Senders in the AWL condition were told that the payoff for each player would be determined as follows:

- Option A: If the receiver chooses the actual number of sender’s group, both sender and receiver will be paid $0.20.
- Option B: If the receiver chooses a number different from the actual group number assigned to the sender, the sender is paid $0.19 and the receiver is paid $0.30.

Senders in the PWL condition, on the other hand, were told that the payoff for each player would be determined as follows:

- Option A: If the receiver chooses the actual number of the sender’s group, both sender and receiver will be paid $0.20.
- Option B: If the receiver chooses a number different from the actual group number assigned to the sender, the sender is paid $0.30 and the receiver is paid $0.30.

We opted for these particular payoffs since they are exactly one fifth of the payoffs used in Erat and Gneezy (2012).
Lying aversion and prosocial behaviour

3 RESULTS

Senders were informed that receivers would not know the payoffs (to either player) associated with each option. The message from the sender was the only information given to the receiver regarding the sender’s group allocation. After observing this message, the receiver was asked to choose one message of the form “The other participant is in group $i$”, and was informed that their choice would determine the payments of the experiment according to two different options (Option A and Option B). Moreover, the receiver was told only that if she chose the same number as the number of the group the other participant was assigned to, both would be paid according to Option A, and that for any other choice, payoff option B would be implemented. Importantly, the receiver was not informed of the actual payments associated with each option.

As observed in Erat and Gneezy (2012), the use of such a rich strategy set (six strategies) allows us to address what Sutter (2009) termed “sophisticated deception”: sending a truthful message believing that it will not be followed by the receiver. Indeed, Erat and Gneezy (2012) show that sophisticated deception is optimal only when the sender believes that the receiver will not believe their message with probability $p > 83\%$. Thus, sophisticated deception is unlikely to play more than a minor role, particularly in light of the finding that 80% of receivers actually follow the received message (see Results section).

3 Results

Participants living in the United States were recruited via the crowd-sourcing internet marketplace Amazon Mechanical Turk (Paolacci, Chandler, Ipeirotis, 2010; Horton, Rand, Zeckhauser, 2011; Bartneck et al., 2015). A total of 1557 distinct subjects (58% males, mean age = 36.26) passed the comprehension questions and participated in our experiment. “Distinct” in this context means that, in case of multiple IP addresses or multiple Turk IDs, we kept only the first decision.

In the first stage of the experiment, 793 participants were assigned to the DG, while 764 played the PD. Dictators on average transferred 25% of their endowment, whilst in the PD cooperation was chosen 40% of the time. Women donated significantly more than men in the DG and cooperated significantly more than men in the PD.

In the second stage, 396 subjects played as senders in the AWL treatment while 388 subjects were assigned the role of senders in the PWL treatment. The remaining 773 participants played the role of receivers. Across all treatments, we find that a significant share of senders (60%) decided to send a true message to the receiver. However, Pareto white lies were told more frequently than altruistic white lies; whilst only 19% of the participants in the AWL treatment chose to lie, 62% of the subjects sent an untruthful message to the receiver in the PWL treatment. These percentages are slightly smaller than those reported by Erat and Gneezy (2012), who found that 43% of senders lie in their AWL treatment and 76% of senders lie in their PWL treatment. A large majority of the recipients (80%) chose the group number communicated by the sender. Gender differences will be discussed separately.

Altruism and lying-aversion

Figure 1 reports the average donations of liars and honests in both the AWL and the PWL treatments and suggests that there is no difference in altruism between liars and honests in the AWL treatment, but there is a statistically significant difference in the PWL treatment. To confirm this, we performed a regression analysis, which showed that the coefficient for the lie dummy variable was statistically significant for the PWL treatment, while it was not for the AWL treatment.

The fact that women give more than men in the DG is reasonably well established, as the majority of studies report either this effect (Eckel and Grossmann, 1997; Andreoni and Vesterlund, 2001; Dufwenberg and Muren, 2006; Houser and Schunk, 2009; Dreber et al. 2013; Dreber, von Essen and Ranehill 2014; Capraro and Marcelletti 2014; Capraro 2015) or a null effect (e.g. Dreber et al. 2013; Bolton and Katok, 1995). In the case of the PD, the situation is unclear, with some experiments reporting that men cooperate more than women, others reporting the opposite, and yet others reporting no effect. See Croson and Gneezy (2009), Section 3.4, for a review of the literature.
Lying aversion and prosocial behaviour

RESULTS

Figure 1: Average donations of liars and honests in both the AWL and the PWL treatments. Error bars represent the standard errors of the means. On the one hand, there is no difference in altruism between liars and honests in the AWL treatment (coeff = -0.0424, p = 0.4027). On the other hand, subjects who tell a lie in the PWL treatment donate significantly less in the Dictator Game (coeff = 0.0960, p = 0.0158).

this we use linear regression predicting donation using a dummy variable representing the decision whether to send a truthful message or not in the Deception Game as independent variable and controlling for all demographic variables. Results confirm that liars donate significantly less than honests, but only in the PWL treatment (AWL: coeff = -0.0424, p = 0.4027; PWL: coeff = 0.0960, p = 0.0158). Full regression table is reported in Appendix B.

Cooperation and lying-aversion

Figure 2 reports the average cooperation among liars and honests in both the AWL and the PWL treatments and suggests that there is no difference in cooperation between liars and honests in the AWL treatment, but there is a statistically significant difference in the PWL treatment. To confirm this we use linear regression predicting cooperation using a dummy variable representing the decision whether to send a truthful message or not in the Deception Game as independent variable and controlling for all demographic variables. Results indeed confirm that liars cooperate significantly less than honests, but only in the PWL treatment (AWL: coeff = 0.0302, p = 0.7624; PWL: coeff = 0.1497, p = 0.0442). Full regression table is reported in Appendix B.

Altruism, cooperation and trust

We investigated how altruism in the DG and cooperation in the PD are related to receivers believing the message sent by the other player. Since the instructions given to the receivers in the AWL condition were exactly the same as those given to the receivers in the PWL condition, we pool the data together. Figures 3 and 4 summarise our results, providing visual evidence that there is no relation between higher donations in the DG and believing the received message in the Deception Game, but there is a significant relation between cooperation in the PD and believing the received message in the Deception Game. This is confirmed by linear regression (DG: coeff = 0.0384, p = 0.2808; PD: coeff = 0.1467, p = 0.0204). Full regression tables are reported in Appendix B.
RESULTS

Figure 2: Average cooperation of liars and honests in both the AWL and the PWL treatments. Error bars represent the standard errors of the means. On the one hand, there is no difference in cooperative behaviour between liars and honests in the AWL treatment ($coeff = 0.0302, p = 0.7624$). On the other hand, subjects who tell a lie in the PWL treatment cooperate significantly less in the Prisoner’s Dilemma ($coeff = 0.1497, p = 0.0442$).

Figure 3: Average donations of receivers as a function of whether they believed the sender’s message or not. Error bars represent the standard errors of the means. There is no statistical difference in altruism between believers and skeptics ($coeff = 0.0384, p = 0.2808$).
Gender differences in deception

Gender differences in deceptive behaviour have attracted considerable attention since the work of Dreber and Johannesson (2008), who found that men are more likely than women to tell a black lie. In the context of white lies, Erat and Gneezy (2012) found that women are more likely than men to tell an altruistic lie, but men are more likely than women to tell a Pareto white lie. Interestingly, the latter result was not replicated by Cappelen, Sørensen, and Tungodden (2013), who found no gender differences in lying aversion in the context of Pareto white lies. In line with this latter result, we also found no gender differences in the PWL treatment (65% of men vs 58% of women tell a lie; coeff = 0.0644, p = 0.2281). However, in the context of altruistic white lies, we found the reverse correlation of that reported in Erat and Gneezy (2012). In our sample, men are significantly more likely than women to tell an altruistic white lie (24% vs 12%; coeff = 0.1090, p = 0.0122).

4 Discussion

We conducted this experiment to explore the relation between cooperation, altruism, and lie-aversion among participants. The setup of our sender-receiver game was such that if the sender chose to lie then there would be an increase in monetary outcome for both players (the Pareto white lie variant, PWL) or an increase in monetary outcome for the receiver at a small cost to the sender (the altruistic white lie variant, AWL). Cooperative tendencies were measured through the Prisoner’s Dilemma (PD), and altruistic tendencies through the Dictator Game (DG).

Our results provide evidence of three major findings: (i) both altruism and cooperation are positively correlated with aversion to telling a Pareto white lie; (ii) neither altruism nor cooperation are significantly correlated with aversion to telling an altruistic white lie; (iii) believing a potentially untruthful message sent by an anonymous stranger is positively correlated with cooperation, but not with altruism.

The positive correlation between altruism and aversion to telling a Pareto white lie was also found by Cappelen, Sorensen and Tungodden (2013). Our results replicate and extend this finding as they also show that the same correlation holds true when considering cooperative behaviour (as opposed to altruistic behaviour), and that these correlations disappear when considering altruistic
white lies (as opposed to Pareto white lies). These are not trivial extensions. Indeed, a positive correlation between altruism in the DG and aversion to telling a Pareto white lie can, in principle, be explained by assuming that there are two types of agents: non-purely utilitarian agents, who aim at maximising the social welfare, but choose the strategy that maximises their payoff in case multiple strategies give rise to the same social welfare (e.g., Charness and Rabin, 2002; Capraro, 2013); and purely egalitarian agents, who minimise payoff differences, irrespective of their own payoff (e.g., Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000 - with suitable values for the parameters of the models). Assuming this is the case, utilitarian agents always tell Pareto white lies (because they increase the social welfare) and give nothing in the DG (because giving does not increase the social welfare); and purely egalitarian agents give half in the DG, yet are indifferent between telling a Pareto white lie or not in the Deception Game (since they both minimise payoff differences). Thus, if the proportion of utilitarian agents is large enough, this would generate a positive correlation between altruism and aversion to tell a Pareto white lie. Explaining our results using distributional preferences is much harder, since utilitarian agents tend to cooperate in the PD, since that increases the total welfare. In order to explain the negative correlation between cooperation in the PD and telling a PWL, one must assume that the majority of utilitarian people actually defects in the PD. But this assumption clashes with the finding that people who tell an AWL (who must be utilitarian, since egalitarian people would tell the truth in the AWL condition) do not give less than the average in the DG. Of course, it is likely that one can find a suitable distribution in types that would explain our findings, but this would be even more far-fetched than that proposed to explain the results of Cappelen, Sorensen and Tungodden (2013).

One alternative potential explanation is that a proportion of people experience a conflict between maximising their own monetary payoff and doing what they think it is the morally right thing to do, whose proximate path is a desire to avoid norm-based guilt (Basile and Mancini, 2011; Carni, Petrocchi, Del Miglio, Mancini and Couyoumdjian, 2013; Izard, 1977; Lewis, 1971; Monteith, 1993; Mosher, 1965; Piers and Singer, 1971; Wertheim and Schwartz, 1983). According to this interpretation, a proportion of these "homines morales" may have non-distributional notions of what they think it is the morally right thing to do: irrespective of economic consequences, they cooperate, share, tell the truth. Besides explaining our first finding, interestingly, this interpretation is consistent also with our second finding. On the one hand, telling the truth in the AWL condition maximises the sender’s individual gain and so attracts self-regarding agents; on the other hand, telling an altruistic white lie maximises the gain of the receiver at a cost to the liar and so attracts other-regarding agents. These attractors work in opposite directions to those observed in the PWL conditions and might explain the disappearance of significant interaction between prosociality and lying aversion in the AWL treatments.

Of course, more research is needed also to support the existence of a possibly non-distributional “moral domain”, containing all those actions that a particular individual considers to be morally right. For instance, here we have focussed on altruism and cooperation, since they are the most studied prosocial behaviours. However, they are not the only ones. Future research may be devoted to understanding whether the same correlations hold for other prosocial behaviours, such as benevolence (i.e., acting in such a way to increase the other’s payoff beyond one’s own, Capraro et al. 2014) and hyper-altruism (i.e., weighting the other’s payoff more than one’s own, Crockett et al. 2014, Capraro 2015).

Explaining our third finding is much easier. Believing a possibly untruthful message and cooperating in a one-shot PD share a dimension of trust that is absent in the Dictator Game. Believing a possibly untruthful message requires that the receiver trust the sender; similarly, cooperating in a one-shot PD requires the agent to trust that the other person will also cooperate; but the Dictator Game is a one-agent game, where the decision does not involve trust. The presence of this common ground may explain the finding that skeptics are less likely to cooperate in the PD, but equally likely to share in the DG. Although interesting, this result suffers from some limitations due to the
fact that the receiver in the Deception Game does not know what varieties of lie can be told by the sender. Would this correlation hold true if the receiver were informed that the sender has to choose whether to tell a Pareto white lie? Further research may shed light on this point.

Finally, our results add to the literature regarding gender differences in deceptive behaviour. Dreber and Johannesson (2008) found that men were more likely than women to tell black lies (e.g., lies that increase the liar’s benefit at the expense of the listener). A similar result was shown by Friesen and Gangadharan (2012), who found that men are more likely than women to behave dishonestly for their own benefit. Yet, Childs (2012) failed to replicate this gender effect using a very similar design to that in Dreber and Johannesson (2008). In the context of white lies, Erat and Gneezy (2012) reported that women are more likely than men to tell an altruistic white lie, but men are more likely than women to tell a Pareto white lie. This latter result was not replicated by Cappelen, Sørensen and Tungodden (2013), who found no gender differences in telling a Pareto white lie. In line with the latter result, our results also show no gender difference in telling a Pareto white lie. But, interestingly, we found gender differences in telling an altruistic white lie, but in the opposite direction than that reported in Erat and Gneezy (2012): we found that men are more likely than women to tell an altruistic white lie. Taken together, these results suggest that it may be premature to draw general conclusions about whether there are general gender differences in lying, and call for further studies.

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Lying aversion and prosocial behaviour

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Appendices

A Experimental instructions

A.1 Dictator Game

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

You have been paired with another participant. The amount of money you can earn depends only on your choice.

You are given 20c and the other participant is given nothing.

You have to decide how much, if any, to transfer to the other participant.

The other participant has no choice, is REAL, and will really accept the amount of money you decide to transfer.

No deception is used. You will really get the amount of money you decide to keep.

Here are some questions to ascertain that you understand the rules. Remember that you have to answer all of these questions correctly in order to get the completion code. If you fail any of them, the survey will automatically end and you will not get any payment.

What is the transfer by you that maximizes your bonus? Available answers: 0c/2c/4c/.../20c.

What is the transfer by you that maximizes the other participant’s bonus? Available answers: 0c/2c/4c/.../20c.

Congratulations, you have answered both comprehension questions correctly!

It is now time to make your choice.

What amount will you transfer to the other person? Available answers: 0c/2c/4c/.../20c.

A.2 Prisoner’s Dilemma

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

You have been paired with another anonymous participant. You are both given 10c and each of you must decide whether to transfer the 10c or not. Each time a participant transfers their 10c, the other participant earns 20c.

Here are some questions to ascertain that you understand the rules. Remember that you have to answer all of these questions correctly in order to get the completion code. If you fail any of them, the survey will automatically end and you will not get any payment.

• If you both decide to transfer the 10c, you end the game with 20c
• If the other participant transfers the 10c and you do not, you end the game with 30c
• If you transfer the 10c and the other participant does not, you end the game with 0c
• If neither of you transfer the 10c, then you end the game with 10c
What choice should you make to maximise your gain? Available answers: Transfer the 10c/Do not transfer the 10c.

What choice should you make to maximise the other participant’s gain? Available answers: Transfer the 10c/Do not transfer the 10c.

What choice should the other participant make to maximise your gain? Available answers: Transfer the 10c/Do not transfer the 10c.

What choice should the other participant make to maximise their gain? Available answers: Transfer the 10c/Do not transfer the 10c.

Congratulations, you have answered both comprehension questions correctly!

It is now time to make your choice. Available options: Transfer the 10c/Do not transfer the 10c.

A.3 Deception Game: Altruistic White Lies treatment

This is the second part of the HIT.

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

You have been matched with another participant, different from the one you were matched with in the first part of the HIT.

There are 6 groups (group 1, group 2, group 3, group 4, group 5, group 6). You will be randomly assigned to one of them. You will be informed of the group you have been assigned to, but the other participants will not. However, he or she will be told that you have been informed about the group allocation.

We will ask you to send a message to the other participant. The message will correspond to a number from 1 to 6. There are six possible messages:

Message 1: “I have been assigned to group 1.”
Message 2: “I have been assigned to group 2.”
Message 3: “I have been assigned to group 3.”
Message 4: “I have been assigned to group 4.”
Message 5: “I have been assigned to group 5.”
Message 6: “I have been assigned to group 6.”

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 choice of the number by the other participant will determine the payments in the experiment.

- If he or she chooses the actual number of your group, then you will receive 20c and he or she will receive 20c.
- If he or she chooses a number different than the actual number of your group, you will receive a 19c and he or she will receive 30c.

Finally, only you will be informed of the particular monetary value connected to each message. The other participant will not be informed of these monetary values. However, he or she will be told that you have been informed of the monetary value connected to each message.
A.4 Deception Game: Pareto White Lies treatment

This is the second part of the HIT.

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

You have been matched with another participant, different from the one you were matched with in the first part of the HIT.

There are 6 groups (group 1, group 2, group 3, group 4, group 5, group 6). You will be randomly assigned to one of them. You will be informed of the group you have been assigned to, but the other participants will not. However, he or she will be told that you have been informed about the group allocation.

We will ask you to send a message to the other participant. The message will correspond to a number from 1 to 6. There are six possible messages:

Message 1: “I have been assigned to group 1.”
Message 2: “I have been assigned to group 2.”
Message 3: “I have been assigned to group 3.”
Message 4: “I have been assigned to group 4.”
Message 5: “I have been assigned to group 5.”
Message 6: “I have been assigned to group 6.”

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 choice of the number by the other participant will determine the payments in the experiment.

- If he or she chooses the actual outcome number of your group, then you will receive 20c and he or she will receive 20c.
- If he or she chooses a number different than the actual number of your group, you will receive a 30c and he or she will receive 30c.

Finally, only you will be informed of the particular monetary value connected to each message. The other participant will not be informed of these monetary values. However, he or she will be told that you have been informed of the monetary value connected to each message.

A.5 Deception Game: receiver

This is the second part of the HIT.

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

You have been matched with another participant, different from the one you were matched with in the first part of the HIT.

Before starting this experiment, we have allocated the other participant to either group 1, group 2, group 3, group 4, group 5 or group 6. We have told the other participant the group to which they have been allocated, but we are not going to tell it to you.
After being informed of the group allocation, the other participant has sent a message to you. The message corresponds to a number from 1 to 6.

There are six possible messages:

Message 1: “I have been assigned to group 1”
Message 2: “I have been assigned to group 2”
Message 3: “I have been assigned to group 3”
Message 4: “I have been assigned to group 4”
Message 5: “I have been assigned to group 5”
Message 6: “I have been assigned to group 6”

The message the other participant sent is as follows:

Message: “I have been assigned to group 1 (similarly for all other group allocations)”

Now we ask you to choose a number between 1 and 6. The message you received is the only information you have about the group the other participant was assigned to. Your choice of a number will determine the payments of the experiment according to two different options (option A and option B), known only to the other participant:

- If you choose the same number as the number of the group the other participant was assigned to, both of you will be paid according to Option A.
- If you choose a different number than the number of the group the other participant was assigned to, both of you will be paid according to Option B.

A.6 Demographic Questions

Here we report all the demographic questions that we have asked. In bold we report the name of the question as it appears in the regression table. Available answers are separated by “/”.

**Sex.** Gender: Male/Female.

**Age.** Age: (participants asked to state exact age in a text box).

**Marital** Marital status: single/dating/in a relationshipmarried/separated/divorced/widowed.

**Siblings.** Do you have siblings? Yes/No.

**Children.** How many children do you have? 0/1/2/3/More than 3.

**Education.** Highest level of education completed: Less than a high school degree/High School Diploma/Vocational Training/Attended College/Bachelors Degree/Graduate Degree/Unknown.

**Wage.** Please choose the category that describes the total amount of income you earned in 2014. Consider all forms of income, including salaries, tips, interest and dividend payments, scholarship support, student loans, parental support, social security, alimony, and child support, and others. Available answers: Under $5,000/$5,000–$10,000/$10,001–$15,000/$15,001–$25,000/$25,001–$35,000/$35,001–$50,000/$50,001–$65,000/$65,001–$80,000/$80,001–$100,000/$100,000.

**Trust1.** How much do you trust people with whom you interact in your everyday life? 1 - very little/2/3/4/5/6/7 - very much.
**Trust2.** How much do you think people trust you in your everyday life? 1 - very little/2/3/4/5/6/7 - very much.

**Politic.** Which US political party do you identify with more strongly? 1 - strongly Republican/2/3/4 - neutral/5/6/7 - strongly Democrat.

**God.** How strongly do you believe in the existence of a God or Gods? 1 - very little/2/3/4/5/6/7 - very much.

**Happy.** Please indicate your current degree of emotion, meaning such characteristics as how pleasant or unpleasant you feel. 1- extremely sad/2/3/4/5/6/7/8/9 - extremely happy.

**Social.** Politically, how conservative are you in terms of social issues? 1- very liberal/2/3/4/5/6/7 very conservative.

**Fiscal.** Politically, how conservative are you in terms of fiscal issues? 1- very liberal/2/3/4/5/6/7 very conservative.

**Experience.** To what extent have you previously participated in other studies like this one (i.e. in which you have to decide whether to send truthful information to another participant)? 1-never/2/3/4/5 - very often.

**Sexorient.** Sexual orientation: Heterosexual/Homosexual/Bisexual/Other/Prefer not to say

**Skeptic** Unlike some other requesters on Mechanical Turk, we never use deception in our studies. Your actions and the actions of others in the study really did affect the bonuses that other individuals will earn. For our own records, to what extent did you believe that the other people were real when making your decision? Available answers: 1-very skeptical that others were real/2/3/4/5/6/7 - very confident that others were real.
## B Regression table

|        | DG | DG | DG | DG | PD | PD | PD | PD |
|--------|----|----|----|----|----|----|----|----|
| AWL    | -0.04 |    |    |    | 0.03 |    |    |    |
| PWL    |    |    |    |    |    | 0.15* |    |    |
| believe | 0.04 |    |    |    | 0.09* |    |    |    |
| sex    | 0.05* | 0.07 | 0.06 | 0.01 | 0.02 | 0.03 | 0.07 |    |
| age    | 0.00 | -0.00 | -0.00 | 0.00 | 0.00 | 0.00 | 0.00 |    |
| education | -0.00 | -0.03 | -0.02 | -0.01 | -0.03 | 0.01 | -0.04 | -0.01 |
| marital | 0.01*** | -0.02 | 0.09 | -0.04 | 0.00 | 0.16 | -0.08 | -0.04 |
| siblings | -0.03 | -0.06 | -0.00 | -0.03 | -0.08 | 0.03 | -0.26* | -0.06 |
| children | 0.01 | 0.02 | -0.02 | 0.01 | 0.01 | 0.03 | 0.01 | -0.05* |
| wage | -0.01 | -0.00 | 0.00 | -0.00 | 0.00 | -0.01 | 0.01 | -0.00 |
| trust1 | 0.00 | 0.03 | 0.01 | 0.01 | 0.00 | -0.03 | 0.02 | -0.03 |
| trust2 | 0.00 | -0.03 | -0.00 | 0.00 | -0.01 | 0.02 | 0.00 | 0.02 |
| politic | 0.01 | 0.05* | 0.03 | 0.00 | 0.03* | 0.05 | 0.03 | -0.02 |
| God | 0.00 | 0.01 | -0.01 | 0.01 | -0.01 | -0.01 | -0.01 | -0.02 |
| happy | 0.00 | -0.01 | -0.01 | 0.00 | -0.01 | 0.00 | -0.00 | 0.02 |
| social | 0.00 | 0.01 | -0.01 | -0.02 | 0.01 | -0.04 | -0.02 | -0.01 |
| fiscal | 0.01 | 0.05* | 0.02 | 0.00 | -0.00 | 0.08* | -0.01 | -0.02 |
| experience | -0.01 | -0.01 | -0.02 | -0.01 | -0.01 | -0.00 | 0.03 | 0.05 |
| sexorient | -0.01 | -0.02 | 0.01 | 0.00 | 0.05* | 0.05* | 0.10 | 0.05 |
| skeptic | 0.02*** | 0.02* | 0.01 | 0.00 | 0.02* | 0.02 | 0.04* | 0.04** |
| constant | 0.02 | -0.08 | -0.13 | 0.03 | 0.01 | 0.28 | 0.03 | 0.14 |
| No. cases | 793 | 211 | 199 | 383 | 764 | 185 | 189 | 390 |

Table 1: Summary of the statistical analysis. We report coefficient, standard error (in brackets), and significance levels using the notation: *: \( p < 0.05 \), **: \( p < 0.01 \), and ***: \( p < 0.001 \).