How to Place Trust Well: An Experimental Study in the Role of the Source of Information*

Juergen Bracht†

Preliminary version April 2009

Abstract

The paper reports on experiments designed to determine the effect of the source of information on cooperation in simple trust games. In the control treatment, without knowing the allocator's history, the investor can invest an endowment; if the investor invests, the allocator can keep or split the returns to investment. In each of the four treatments, the investor receives information about the allocator. The first treatment replicates a previous finding: When a reliable authority informs the investor about the allocator's last choice, allocator's trustworthiness is enforced and investor's trust is built (Bracht and Feltovich (2009)). In the second treatment, each allocator sends a message about his past play to the investor. This treatment in ineffective: allocators are selfish and deceive investors about opportunistic actions; investors become more and more discouraged. In the third treatment, each investor forwards information about the allocator's response to the allocator's next investor. This treatment is effective: cooperation and efficiency are increased. In the fourth treatment, a third party – a randomly selected impartial observer – forwards information about an allocator's history. This is the most interesting treatment: Doing the right thing (telling the truth about opportunistic behavior) conflicts with promoting society's material benefit (lying about opportunism to encourage investment). Surprisingly, this treatment is effective: The impartial observer tends to tell the truth,

*I am grateful to the British Academy for funding the experiment. I thank participants at a seminar at the University of Bath for helpful suggestions and comments.

†Department of Economics, University of Aberdeen Business School, Old Aberdeen AB24 3QY UK. e-mail juergen.bracht@abdn.ac.uk.

both investors and allocators anticipate truthful reporting, and co-operate. www.abdn.ac.uk/~pec202/newPaper.pdf

Keywords: mechanisms, experiments
JEL: H42, D62

Trust and trustworthiness are key components of social capital. A fast growing body of research suggests that social capital influences a wide range of economic, political and legal phenomena (economic growth, efficiency of local government, corruption of bureaucracy, judicial efficiency).

Traditionally, social scientists have tried to identify the impact of social capital by using attitudinal measures of trust from survey questionnaires. Survey questions are interesting, but they are also abstract and hard to interpret. It is now widely agreed that trust and trustworthiness are measured well by observing actual decisions in controlled experiments with monetary rewards. Here is how: Two strangers are placed at computer terminals. They never meet and they never learn each others' identity. One is selected to receive an endowment. She can keep the money for herself, or send it. Think of the player as being an investor who has the opportunity to invest in a project. The experimenter quadruples the amount of the investment (the investment is always successful) and transfers the money to the investor's partner, the allocator. The allocator may split the returns evenly and send it back to the investor or he may keep the money for himself. This experimental game is known as the trust game. We can think of the investor's decision as a natural measure of her trust. Similarly, the allocator's decision is a measure of his trustworthiness.

As an investor, could one rely on the goodwill of the trustee? How do subjects play the game? A number of experiments have been done: No clear-cut pattern emerges; some subjects are trustworthy, others are not and others are trustworthy some of the time and untrustworthy some of the time. When subjects play the same game for a few times, allocators typically tend to be trustworthy at the beginning, and then revert to opportunistic play toward the end of the experiment (Berg, Dickhaut and McCabe (1995), Bolton, Katok, Ockenfels (2004), Bracht and Feltovich (2008), also see Camerer).

Certainly, as an investor, you could not be sure that you would be safe relying on people behaving honourably. One needs to place trust well. To place trust well one needs ways to tell trustworthy from untrustworthy trustees.

The experimenter who is interested in promoting benefits for society (investment) may wish to modify the game and let the investor monitor the allocator's behaviour in a previous situation. Monitoring may sound unfriendly, but this mechanism - when put in place in the experiment - is very effective (Bracht and Feltovich (2009)). It appears that information about an allocator's past actions disciplines the allocator: Some people are still trustworthy because they want to do what is right, others now behave as if they are honourable.

In the first experimental treatment, I replicate the previous finding: When a reliable authority (that is the experimenter who is a member of the faculty

of the university) forwards information about the allocator's history to the investor, the information mechanisms will work effectively and trustworthiness of allocators is enforced and trust of investors is built.

In the second treatment, allocators themselves forward information about their history. This treatment is ineffective or even harmful as allocators tend to deceive investors about opportunistic actions (see Gneezy (2005) on support for statement from Cheap Talk Sender-Receiver games).

In the third treatment, a third party – another randomly selected participant – forwards information about the allocator's past history. The third party is paid for participation in the experiment and not according to the outcome of the game. The third party's role is that of an impartial observer. This is the most interesting treatment as doing the right thing (telling the truth about opportunistic behavior) conflicts with promoting society's benefit (lying about opportunism to encourage investment). Immanuel Kant has provided a consistent justification for "doing the right thing". According to Kant, there are ways of acting that are wrong for anyone, in any situation, at any time. For example, it is always wrong to deceive (Kant (1787)). When you deceive by lying, you are acting on a principle that you could not want to be adopted by everyone.

Surely, experience has taught us that not everyone is honest and trustworthy. So, Kant's account of an ideal social order is too idealistic. Nevertheless, experience has also taught us that trust is destroyed by deception, so a small step to a better world is to refuse to lie to build trust (O'Neill (2002)). Clearly, there is no guarantee that honourable behaviour of intermediaries will emerge as misrepresentation might harm no one, help someone (i.e. white lie) and enlarge total surplus (see Charness and Rabin (2002) for a discussion of the efficiency motive).

The objective of this paper is to examine the effects of mechanisms that do not rely on a third party with coercive power. We consider mechanisms that make small changes to the original game—involving only transmission of information. The source of information changes with the treatment.

1 Background

Social dilemma: rational behaviour by individuals leads to outcomes which are bad from the standpoint of the group. Example: Simplified trust game. Efficiency —> Prob(Invest)=1. In all Nash equilibrium outcomes, Prob(Invest)=0. After Invest, Allocator would choose Keep with high enough probability to make Invest a lower - payoff choice than Not Invest for Investor. Typical experimental result: frequencies of cooperation (Invest and Split) are closer to

zero than one. We are asking the research question: How can cooperation be increased? One possibility: tack a mechanism onto the basic social-dilemma problem.

Examples of add-on mechanisms:

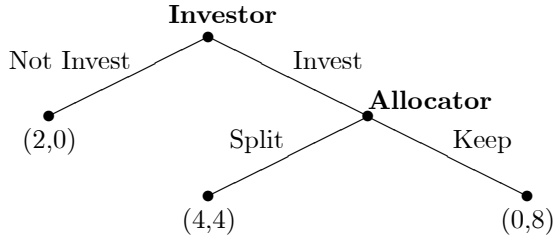
- **Commitment**: individuals are able to credibly commit to cooperative actions (e.g., Van Huyck, Battalio, and Walters (1995)—equivalent to changing the order of moves).
- **Compensation**: individuals make binding promises to pay others to cooperate; **Tax/subsidy**: the designer subsidizes cooperative behaviour and taxes uncooperative behavior (e.g., Bracht, Figuières, Ratto (2008)).
- **Escrow**: individuals set penalties for their own future uncooperative behaviour (e.g., Bracht and Feltovich (2007)).

These mechanisms change the structure of the game so that cooperation becomes consistent with equilibrium behavior. But, all of these rely on a third party with coercive power to impose cooperative behavior indirectly via changing incentives or to enforce voluntary agreements between players. If such a third party exists, why not just skip the mechanism and impose cooperative behaviour from the start?

2 Dismal prediction

We investigate the simple trust game shown in the figure.

Figure 1: The basic trust game



The economist's prediction for this game is: a selfish allocator would always prefer to keep all proceeds from investment rather than sharing with

the investor. A selfish investor who understands the allocator's situation would understand that any investment will be lost, so will chose not to invest. The economist's prediction is dismal indeed: both, investor and allocator, would be better off if the investor would send the money and the allocator would return the fair share.

In the experiment, subjects take turns to play one another.

3 Add-on Mechanisms

We look at four mechanisms that are tack on the basic trust game.

- **Authority Messenger**: Before play, the authority sends a free message to the investor indicating the allocator's last response when a previous investor chose Invest.
- **Allocator Messenger**: Before play, the allocator sends a free message to the investor indicating her last response when a previous investor chose Invest.
- **Investor Messenger**: After play, the investor sends a free message to the allocator's next investor about the allocator's last choice if already made.
- **Third-Party Messenger:** After play, the third party sends a free message to the allocator's next investor about the allocator's last choice if already made.

3.1 Dismal Predictions for add-on mechanisms

If the number of rounds is finite and commonly known, adding any of these mechanisms has no effect on the subgame perfect equilibrium prediction (Not Invest, Keep).

4 Related literature on cheap talk and observation — results

The paper is related to several strands in the experimental literature.

- **Communication in social dilemmas**: lots of work, but in general, effect depends on medium and message space.

Unstructured, face-to-face —> substantial gains in cooperation and efficiency (e.g., Isaac and Walker (1988), Ostrom, Walker, and Gardner (1992)).

Highly circumscribed, via computer —> small gains (Duffy and Feltovich (2002)), no systematic effect (Bochet, Page, and Putterman (2006)), or substantial losses (Wilson and Sell (1997)) in cooperation and efficiency.

- **Observation of previous actions in social dilemmas**: widely-varying effects, depending on the form observation takes.

  Information about others in the same role (Duffy and Feltovich (1999), Huck, Normann, and Oechssler (1999, 2000), Busch-Doménech and Vriend (2003)).

Increased end-of-round feedback (Wilson and Sell (1997)).

Observation by a third party (Kahneman, Knetsch and Thaler (1986), Fehr and Fischbacher (2004), Charness, Cobo-Reyes, and Jiménez (2006), Sutter, Lindner, and Platsch (2006)).

The closest literature is on information about past opponent behavior when matched to someone else (Bracht and Feltovich (2009), Bolton, Katok and Ockenfels (2004), Duffy and Feltovich (2002, 2006), Huck, Ruchala, and Tyran (2006)).

5 Experimental Design

Instructions are in the appendix.

Rules We obey the norms of Experimental Economics.

Time span Sessions were run at the SEEL laboratory between March 2008 and March 2009.

Subject pool Three/six sessions of each treatment. Normally, 20 subjects per session. Sizable data set.

Treatments All treatments: basic trust game in rounds 1-5.

Control treatment: basic trust game in rounds 6-15 as well.

Authority treatment: Experiment send message in rounds 6-15.

Allocator treatment: Allocator sends message in rounds 6-15.

Investor treatment: Investor sends message in rounds 6-15.

Third Party treatment: Third Party sends message in rounds 6-15.

Null Hypotheses (derived from predictions of Subgame Perfect Equilibrium with individualistic preferences):

Frequency of Invest equal in all treatments.

Conditional frequency of Split equal in all treatments.

Assignment Subjects were randomly assigned to roles at the beginning of the session and remained in the same role throughout the session.

Round-robin tournament Subjects take turns to play one another.

Computer Computerized experiment (z-TREE) at the SEEL laboratory in Aberdeen, Scotland.

End-of-round feedback Investor action, Allocator action (if any), and own payoff.

Payment £5 fee, plus payments from one randomly-chosen round from 1-5 and one from 6-15 (£1 per point).

Duration Sessions lasted 45 minutes, average payment around £11.

6 Aggregate subject behavior

The table shows behavior aggregated over subjects and time. We look at investor behavior (frequency of invest) and allocator behavior (conditional frequency of split).

Aggregate subject behavior				
	Frequency of Invest		Frequency of Split	
Treatment	Rds 1–5	Rds 6–15	Rds 1–5	Rds 6–15
Control	.567 (85/150)	.400 (120/300)	.377 (53/85)	.408 (49/120)
Authority	.519 (70/135)	.633 (171/270)	.386 (27/70)	.825 (141/171)
Investor	.495 (99/200)	.688 (275/400)	.323 (32/99)	.801 (221/276)
Third Party	.610 (122/200)	.613 (245/400)	.492 (60/120)	.481 (157/245)
Allocator	.535 (107/200)	.470 (188/400)	.377 (40/106)	.473 (89/188)
All	.551 (413/750)	.552 (828/1500)	.398 (164/412)	.622 (516/829)

For each treatment, we want to find out whether behavior is different with respect to the control. For a two-sided test, we find the following probability values.

- **Authority treatment:** $p < 0.01$ for both Invest and Split.
- **Investor treatment**: $p < 0.05$ for both Invest and Split.
- **Third-Party treatment:** $p < 0.05$ for Invest, $p < 0.10$ for Split.
- **Allocator treatment:** $p < 0.10$ for Invest and Split.

We summarize the conclusion: The authority and investor treatment significantly and substantially affect behavior with respect to the control treatment. The third party treatment has a substantial impact as well, but the size is a bit smaller. The allocator treatment is much less effective.

7 Subject behavior round-by-round

The figures in the appendix shows round-by-round behavior. Figure 1 shows the frequencies of Split and figure 2 shows the frequency of Invest.

We see that the frequencies start at a high level, but drop sharply over time. We also see a restart effect, even in the control treatment as frequencies of Invest and Split jump up sharply upward from round 5 to 6, even though no feature of the game has changed. The corresponding frequencies also jump upward in the other treatments, though it is unclear whether this is a restart effect or the result of changes to the game's structure or incentives. In the control and allocator treatment, the frequency of Split is about one-half after the restart and remains constant over time; in the investor and third party treatment, it is substantially higher (between 70% and 90%) for several rounds, until dropping over the last round or two. The frequency of Invest is roughly similar across treatments in round 6 (despite the differences in Split frequencies), but diverge quickly. In the allocator treatment, the frequency drops quickly at first, then gradually. In the investor treatment, on the other hand, the frequency of Invest stays roughly constant for several rounds before dropping sharply at the end of the session.

In rounds 6-14, both Invest and Split are more likely when the messenger is the Investor than when the messenger is the Third Party than when messenger is the Allocator.

We now look at behavior in more detail. For the allocator treatment the frequency of the messages is shown in the following table:

Allocator treatment	
Frequency of message (%)	
KEPT	4.50
SPLIT	72.50
NO DECISION	23.00

We see that KEPT messages are infrequent. The most frequent message is Split.

Figure 3 shows frequencies of Invest if the message received was Split. We see that, initially, investors are positively affected by received Split messages from allocator. But the frequency of Invest drops steadily. Probably, this is so because investors learn that Split messages are not indicative for SPLIT action. The frequency of Split when a Split message was sent, while intitially very high, drops sharply.

For the investor treatment the frequency of the messages is shown in the following table:

Investor treatment	
Frequency of message	(%)
KEPT	23.25
SPLIT	56.00
NO DECISION	20.75

We see that KEPT messages are not frequent. The most frequent message is Split.

Figure 4 shows frequencies of Invest if the message received was Split. We see that investors are clearly affected by received message from previous investor. Probably, because almost always investors are forwarding the truth i.e. the frequency of a Split message when the investors saw a Split action is very high. Note last round behavior.

For the third party treatment the frequency of the messages is shown in the following table:

Third Party treatment	
Frequency of message	(%)
KEPT	24.75
SPLIT	43.00
NO DECISION	32.25

We see that KEPT messages are not frequent. The most frequent message is Split.

Figure 5 shows frequencies of Invest if the message received was Split. The frequency above 50% and stays around that level during the experiment. Probably, because the Third Party is forwarding the truth, some times and some times not. The frequency of Split message given a Split action shows variation

8 Empirical strategy

We estimate the effect of each treatment on investor behavior and allocator behavior in each round, for each of the four treatments.

We report results of two regressions as we look at two samples: the set that includes all observations; the subset of the data that includes observations only if the investor invested.

8.1 Effect on Investor

We estimate the **effect of four treatments in each round**. **Dependent variable**: (D1) Dummy variable, INVEST, takes on the value one if the investor invests and zero if the investor does not invest. **Explanatory variables**: (E1-4) Dummy variables for treatment with various sources of information: AUTHORITY takes on the value one if the source of information is the experimenter and zero otherwise; INVESTOR takes on the value one if the source is the allocator and zero otherwise; ALLOCATOR takes on the value one if the source is the allocator and zero otherwise. THIRD_PARTY takes on the value one if the source is the observer and zero otherwise. **Controls for time dependence**: (C1) the period number, ROUND_NUMBER, takes on the values 1,...,10 corresponding to the ten rounds in the treatment; (C2) dummy variable, RESTART, for the impact of the restart between the first and second part of the experiment. RESTART takes on the value one for the first round of the treatment and zero otherwise; (C3) dummy variable for the last round of the treatment, END_GAME. END_GAME takes on the value one for the last round and zero otherwise. **Other controls**: I also try to control for individual differences in intrinsic social capital. Hence, I include a measure from the first part of the session; for investors, I measure trust by the frequency of Invest choices in rounds 1-5. For allocators, I measure trustworthiness by the frequency of Split choices.

8.2 Effect on Allocator

Dependent variable: (D2) Dummy variable, SPLIT, takes on the value one if the investor invested and the allocator split and zero otherwise. I repeat the exercise and estimate the effect of four treatments. I include the same set of explanatory variables and controls as in the previous subsection**.**

The regressions are probit regressions with individual-subject random effects.

The table will show the coefficient estimates, standard errors, log-likelihoods and pseudo-R-squared (computed by rescaling the log-likelihood into [0,1] such that a model with no-right-hand-side variables other than the constant term maps to zero, and a perfect fit maps to one.

	invest	split
Standard errors in parenthesis		
constant		
round number		
final round		
measure of trust/trustworthiness		
messenger - allocator		
messenger - allocator*round_number		
messenger - allocator*end_game		
-ln(L)		
pseudo-R-squared		
Coefficient significant at the 10%, 5%, 1% level		

I will estimate the incremental effects of treatment on the Invest/Split choice: $\Phi(X * B + beta * T) - \Phi(X * B)$ where Φ is the standard normal cumulative distribution, where X is the row vector of the other RHS variables, where B is the column vector of the coefficients.

I will report the point estimates and 95% confidence interval, each round. Note that the marginal effect of the interaction between two variables is not equal to the coefficient of the interaction term. See Ai and Norton; Norton et al. 2004.

9 Summary

In this paper, I have revisited a remarkably successful mechanism that substantially and significantly improves cooperation and efficiency in the trust game (Bracht and Feltovich (2009)). We had found that when a reliable authority forward information about allocator's choice history to the investor, investor's trust is built as allocator's trustworthiness is enforced.

While effective, this mechanism has a potential drawback: To tell trustworthy from untrustworthy allocators, investors might now need ways to tell trustworthy from untrustworthy information about trustees' behavior. However, obtaining trustworthy information about strangers is dauntingly hard in a world of one-way communication between strangers as any newspaper reader will testify.

I have investigated the effect of the source of informatiom on cooperative behavior and efficiency in a series of experiments. The treatment variable is the source of information:

1. the allocator himself can send a message about his previous actions,
2. the allocator's previous investor can squeal,
3. and a neutral observer can be the messenger.

I found that allowing for

- messages from the investors about allocator's previous action leads to more cooperative behaviour of both investors and allocators (i.e. higher frequency of Invest and Split)

  .... but not in final round. Implication: observation wouldn't help if Allocators didn't know they were going to be observed.

- messages from the third party (impartial observer) about allocator's previous action leads to more cooperative behaviour of both investors and allocators (i.e. higher frequency of Invest and Split)

  .... but not in final round. Implication: observation wouldn't help if Allocators didn't know they were going to be observed.

- messages from the allocator about his previous action do not improve cooperation

- ... but they don't reduce cooperation either.

References

[1] Arrow, K.J., 1972, Gifts and exchanges, Philosophy & Public Affairs 1, 343-362

[2] Berg, J., Dickhaut, J., McCabe, K., 1995, Trust, reciprocity, and social history, Games and Economic Behavior 10, 122 – 142

[3] Bolton, G., Katok, E., Ockenfels, A., 2004a, How effective are electronic reputation mechanisms? An experimental investigation, Management Science, 50, 1587-1602

[4] Bolton, G., Katok, E., Ockenfels, A., 2004b Trust among internet traders: a behavioral economics approach, Analyse & Kritik, 26, 185-202

[5] Bolton, G.E., Katok, E., Ockenfels, A., 2005, Cooperation among strangers with limited information about reputation, Journal of Public Economics, 89, 1457-1468

[6] Bracht, J., and Feltovich,.2008, N., Efficiency in the trust game: an experimental study of precommitment, 2008, Int J Game Theory 37, 39-72

[7] Bracht, J., and Feltovich,.2009, Whatever you say, your reputation precedes you: observation and cheap talk in the trust game, 2009

[8] Charness, G., Rabin, M., 2002, Understanding social preferences with simple tests, Quarterly Journal of Economics, 117, 817-69

[9] Fehr, E., Fischbacher, U., Schupp, J., von Rosenbladt, B. Wagner, G.G., 2003, A nationwide laboratory examining trust and trustworthiness by integrating behavioural experiments into representative surveys, CEPR Discussion Papers 3858, C.E.P.R. Discussion Papers

[10] Greiff, A., 2006, Institutions and the path to the modern economy: lessons from medieval trade, Cambridge University Press

[11] O'Neill, O., 2002, A question of trust, The BBC Reith Lectures, Cambridge University Press

[12] Johnson, R., 2004, Kant's Moral Philosophy, The Stanford Encyclopedia of Philosophy , Edward N. Zalta (ed.), http://plato.stanford.edu/entries/kant-moral.

[13] Fehr, E., Fischbacher, U., Schupp, J., von Rosenbladt, B. Wagner, G.G., 2003, A nationwide laboratory examining trust and trustworthiness by integrating behavioural experiments into representative surveys, CEPR Discussion Papers 3858, C.E.P.R. Discussion Papers

[14] Glaeser, E.L., Laibson D.I., Scheinkman, J.A., Soutter, C.L., 2000, Measuring trust, The Quarterly Journal of Economics, 811-846

[15] Bellemare, C., Kröger, S., 2003, On representative trust, Discussion Paper 47, Tilburg University, Center for Economic Research

[16] Johnson, R., 2004, Kant's Moral Philosophy, The Stanford Encyclopedia of Philosophy , Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/entries/kant-moral//>.

[17] Kant, I., 1787, On a supposed right to lie from benevolent motives, in Lewis W. Beck, ed., The critique of practical reason and other writings in moral philosophy, University of Chicago Press, 1949, 346-50

[18] Gneezy, U., 2005, Deception: The Role of Consequences, The American Economic Review, 95, 384-394

[19] Ortmann, A., Hertwig, R., 2002, The costs of deception: evidence from psychology, Experimental Economics, 5, 111-131e introduction of the mechanism and convergence to the equilibrium.

Appendix

Figure 1

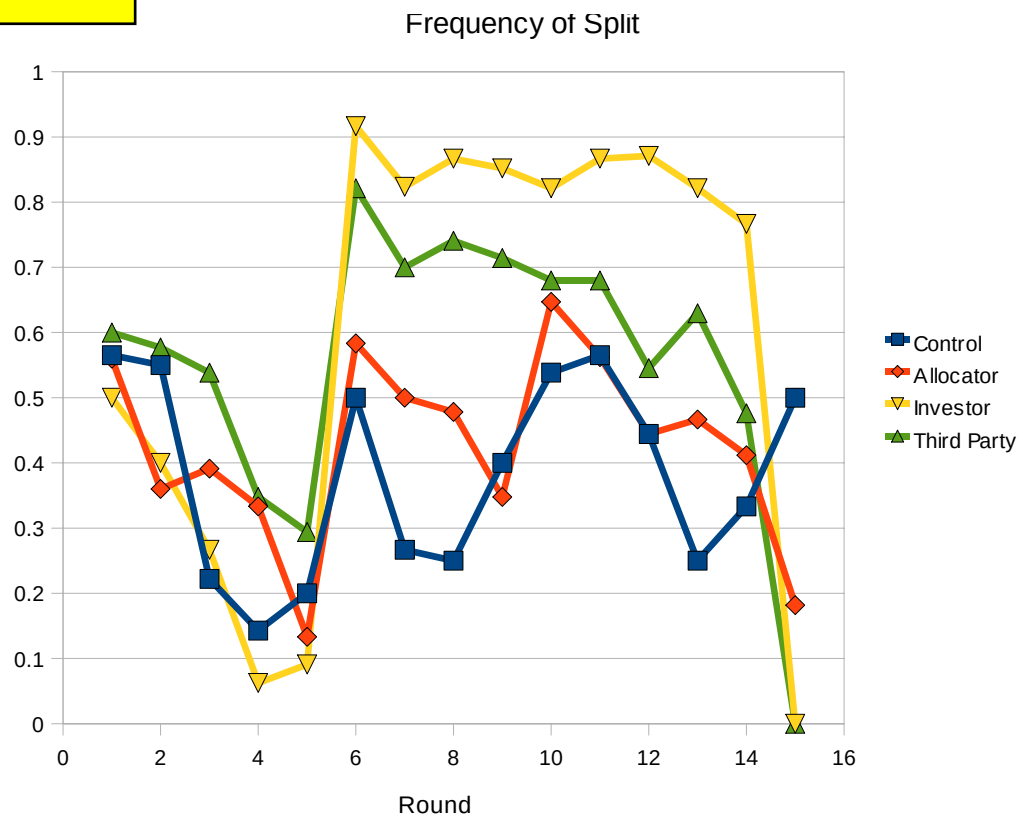


Figure 2

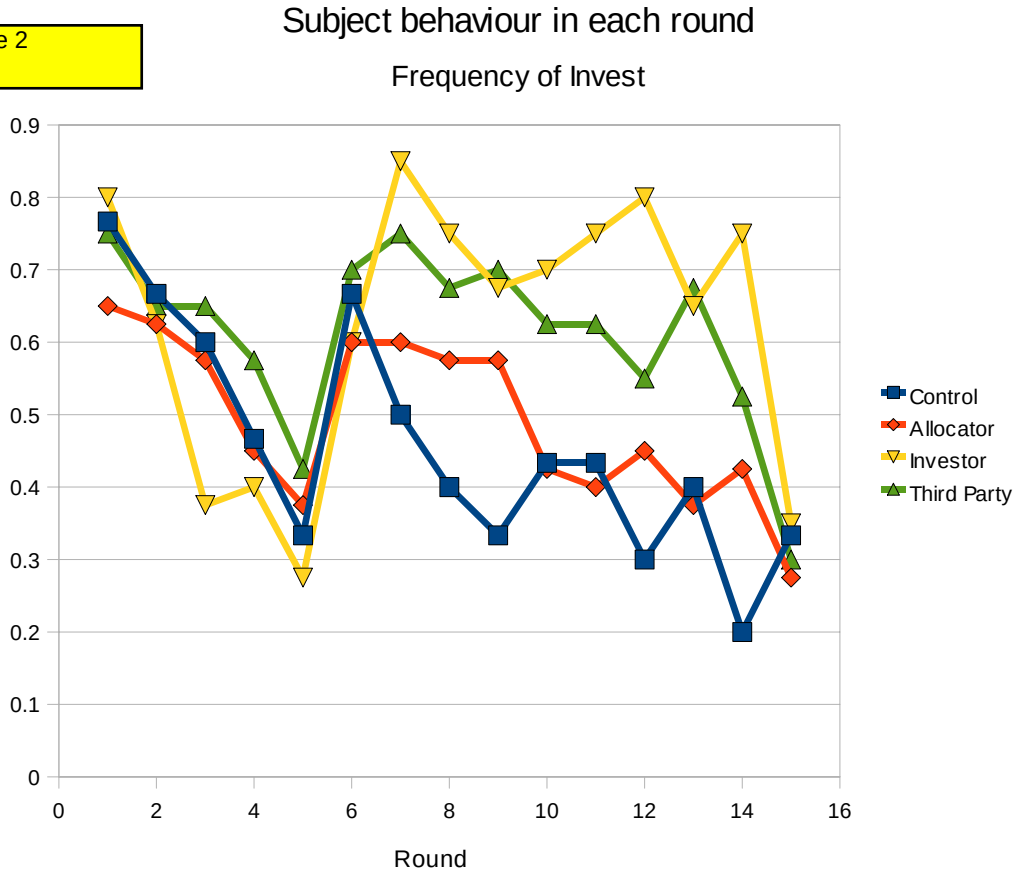


Figure 3

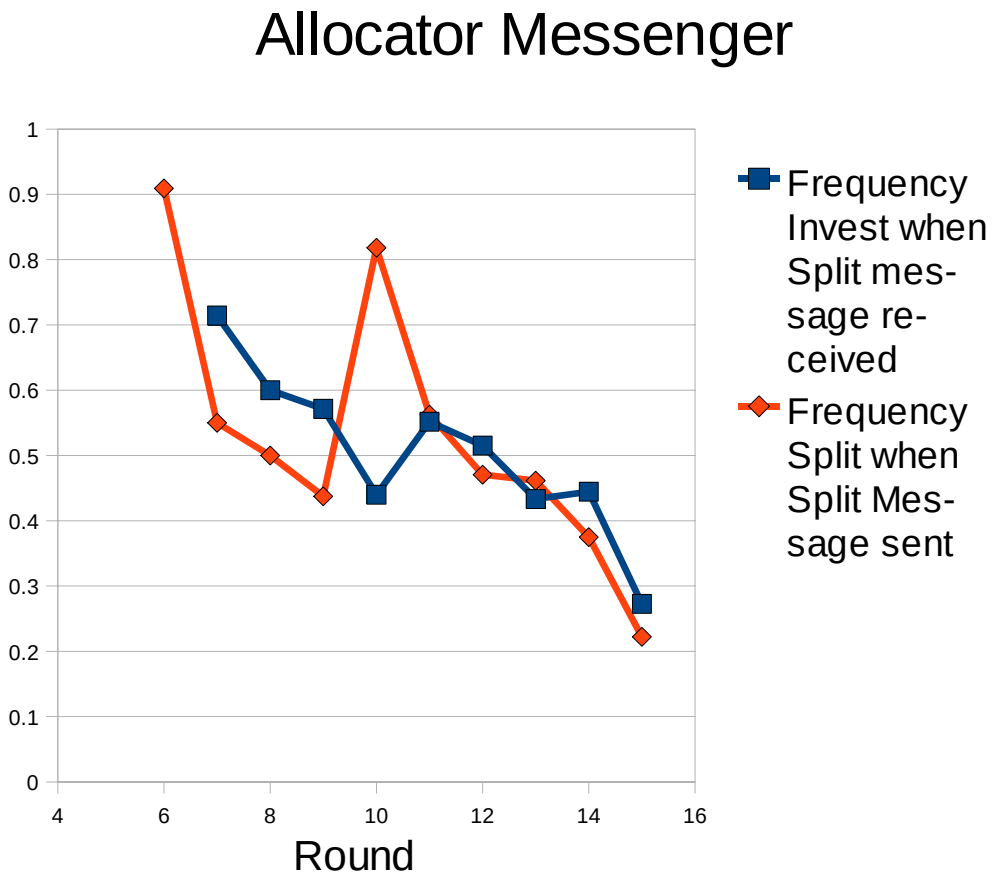

Allocator Messenger
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
4
6
8
10
12
14
16
Round
Frequency Invest when Split message received
Frequency Split when Split Message sent

Figure 4

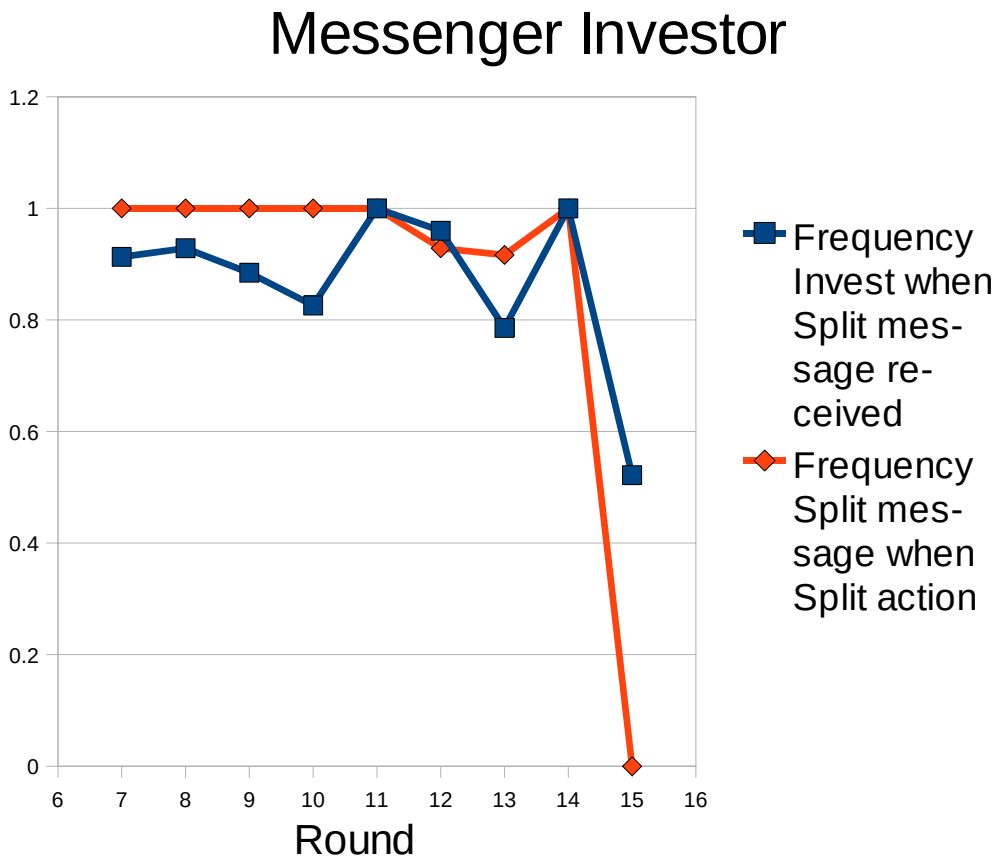
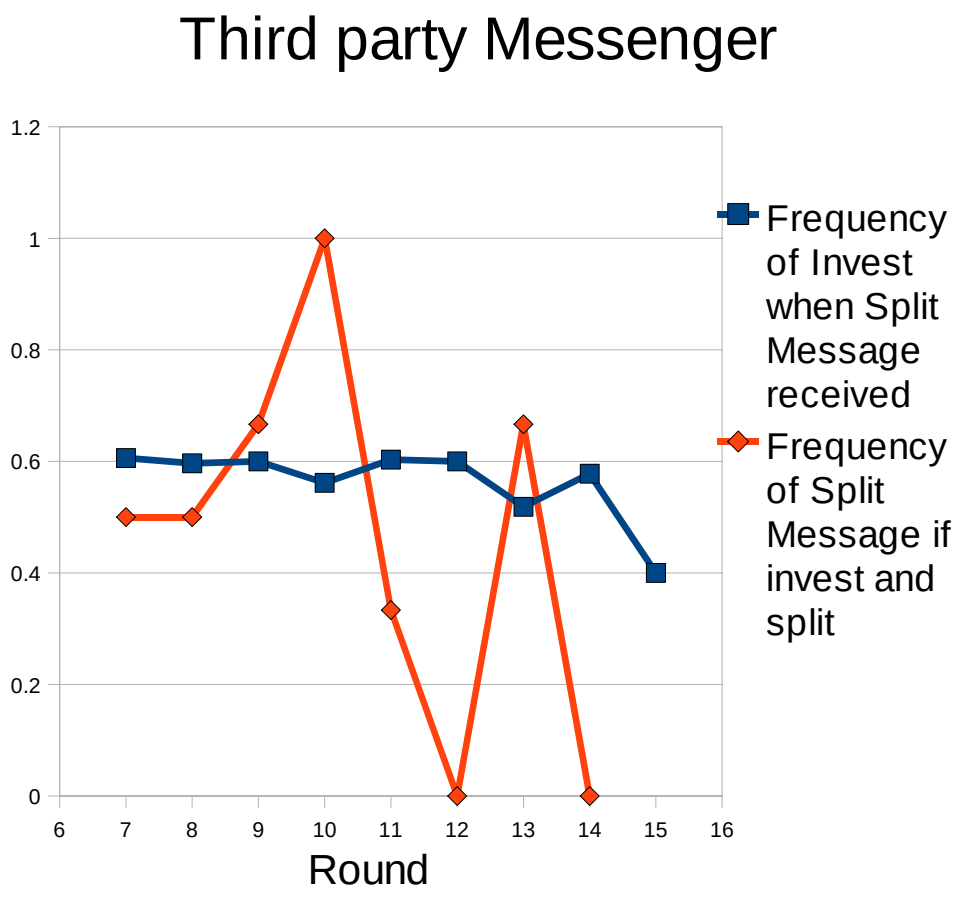

Messenger Investor
1.2
1
0.8
0.6
0.4
0.2
0
6
7
8
9
10
11
12
13
14
15
16
Round
Frequency Invest when Split message received
Frequency Split message when Split action

Figure 5


Third party Messenger
1.2
1
0.8
0.6
0.4
0.2
0
6
7
8
9
10
11
12
13
14
15
16
Round
Frequency of Invest when Split Message received
Frequency of Split Message if invest and split

Instructions—first part of experiment (A)

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions whenever possible, you might earn a considerable amount of money that will be paid to you in cash. If you have a question at any time, please feel free to ask me. We ask that you not talk with the other participants during the experiment.

This experimental session is made up of 2 halves. The first half lasts for 5 rounds, and the second half lasts for 10 rounds. Each round of the first half consists of one play of a simple investment game, which is described below. Each round of the second half also consists of one play of an investment game, which may be the same as the game from the first half, or it may be different. That game will be described after the first half has ended.

The investment games are played between 2 players, called **Investor** and **Allocator**. Before the first round begins, each of the participants is randomly assigned one of these roles; half will be **Investors** and half will be **Allocators**. Participants will remain in the same role throughout the experimental session.

In each round, you will be randomly matched to a player of the opposite role. You will not be told the identity of the person you are matched with in any round, nor will they be told your identity—even after the end of the session.

The **sequence of play** in a round is as follows:

1. The **Investor** has 2 points and chooses whether to Invest or Not Invest them.
2. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them; after this, the round ends.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

So, if you are an **Investor**, your score in each round will depend on your choice and, in some cases, the choice of the person you are matched with. If you are an **Allocator**, your score in each round will depend on the choice of the person you are matched with, and, in some cases, your choice.

Payments: At the end of the experimental session, two rounds are chosen randomly —one from the first half and one from the second half. Each participant receives, in pounds, the total number of points he/she earned in those two rounds. Each participant additionally receives £5 for completing the session. Payments are made in cash at the end of the session.

Instructions—second part of experiment (A)

The procedure in this half of the experiment is very similar to that in the first half. Your role will be the same as in the first half. In each round, you will be randomly matched to a player of the other role. The only difference is that the investment game has an additional stage. Before the **Investor** makes a choice, the **Allocator** can send **information about his/her previous decision** in the investment game in **this second part** of the experiment, if already taken.

The **sequence of play** in a round is now as follows:

0. The **Allocator** can send information about his/her **previous decision** in this second part of the experiment to the **Investor**.
1. The **Investor** sees the **Allocator**'s information, then chooses whether to Invest or Not Invest the 2 points.
2. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no further decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them. After this choice is made, the round ends.

Rules of the information:

- The **Allocator** can send the following information about his/her **last choice**, if already made:
  1) I have kept the returns of investment OR
  2) I have split the returns of investment OR
  3) I have not had to make a decision yet.
- It is not possible for the **Allocator** to send no information at all.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

Instructions—first part of experiment (T)

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions whenever possible, you might earn a considerable amount of money that will be paid to you in cash. If you have a question at any time, please feel free to ask me. We ask that you not talk with the other participants during the experiment.

This experimental session is made up of 2 halves. In both halves, investment games are played between 2 players, called **Investor** and **Allocator**. Before the first round begins, two-thirds of the participants are randomly assigned these roles; half of these will be **Investors** and half of these will be **Allocators**. The remaining one-third will be a **Third Party**. Participants will remain in the same role throughout the experimental session.

The first half of the session lasts for 5 rounds and the second half lasts for 10 rounds. Each round of the first half consists of one play of a simple investment game, which is described below. Each round of the second half also consists of one play of an investment game, which may be the same as the game from the first half, or it may be different. That game will be described after the first half has ended. In each round, an **Investor** will be randomly matched to an **Allocator**. You will not be told the identity of the person you are matched with in any round, nor will they be told your identity—even after the end of the session.

The **sequence of play** in a round is as follows:

1. The **Investor** has 2 points and chooses whether to Invest or Not Invest them.
2. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them; after this, the round ends.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

So, if you are an **Investor**, your score in each round will depend on your choice and, in some cases, the choice of the person you are matched with. If you are an **Allocator**, your score in each round will depend on the choice of the person you are matched with, and, in some cases, your choice. If you are a **Third Party**, you have a more passive role in this part of the experiment; we will assign a small paper-and-pencil task to the **Third Party**.

Payments: Payments are made in cash at the end of the session. Each participant receives £5 for completing the session.
Additionally, at the end of the experimental session, the computer will choose two rounds randomly —one from the first half and one from the second half. Each **Allocator**/**Investor** receives, in pounds, the total number of points he/she earned in those two rounds.
In addition, at the end of the experimental session, one round will be chosen randomly. Each **Third Party** receives, in pounds the total number of points he/she earned in that round. Each **Third Party** also will receive a compensation of £4 for taking part in the second half.

Instructions—second part of experiment (T)

The procedure in this half of the experiment is similar to that in the first half. Your role will be the same as in the first half. The only difference is that the investment game has an additional stage in which the **Third Party** plays an more active role. In each round, an **Investor**, an **Allocator** and a **Third Party** will be randomly matched. You will not be told the identity of the persons you are matched with in any round, nor will they be told your identity—even after the end of the session. Before the **Investor** makes a choice, the **Investor** can learn about the **Allocator's previous decision** in the investment game in **this second part** of the experiment from a **Third Party**.

The **sequence of play** in a round is now as follows:

0. The **Investor** sees the information about the **Allocator's last choice** (if made) from the **Third Party**, then chooses whether to Invest or Not Invest the 2 points.
1. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no further decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them. After this choice is made, the round ends.
2. The **Third Party** can send information about the **Allocator's choice in this round** if made to both the **Allocator's next Investor** and the **Allocator's next Third Party**. If, in the current round, the **Investor** does not invest and the **Allocator** does not make a choice, the **Third Party** can forward information received from the **Allocator's previous Third Party**.

Rules of the information:

- The **Third Party** can send the following information about the **Allocator's last choice**, if already made:
  1) The **Allocator** has kept the returns of investment OR
  2) The **Allocator** has split the returns of investment OR
  3) The **Allocator** has not had a decision to make yet.
- It is not possible for the **Third Party** to send no information at all.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

Third-Party task You have been assigned a paper-and-pencil task for the first part of the experiment.

Recall the games that are played between **Investor** and **Allocator:** In each round, the **Investor** has 2 points and chooses whether to Invest or Not Invest them. If the **Investor** chooses Not Invest, the round ends, the **Investor** earns 2 points and the **Allocator** earns 0 points. If the **Investor** chooses Invest, then the investment yields 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them; if the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points. However, if the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

Suppose you were an **Investor** and you could commit to your choices in 5 rounds of the game. Please record the choice in each round that you would make in the table below:

	Investor's decision (Invest/Do not Invest)
Round 1	
Round 2	
Round 3	
Round 4	
Round 5	

Suppose you were an **Allocator**. Suppose also that the investor has invested in each of the 5 rounds. Suppose you could commit to your choices in the 5 rounds. Please record the choice in each round that you would make in the table below:

	Investor's decision (Invest/Do not Invest)	Allocator's decision (Keep/Split)
Round 1	Invest	
Round 2	Invest	
Round 3	Invest	
Round 4	Invest	
Round 5	Invest	

Payment for the first half*:* At the end of the experimental session, your role will be chosen randomly, one round will be chosen randomly and you will be matched with another participant. Your score in that role and that round will determine your payment for the first half.

Instructions—first part of experiment (I)

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions whenever possible, you might earn a considerable amount of money that will be paid to you in cash. If you have a question at any time, please feel free to ask me. We ask that you not talk with the other participants during the experiment.

This experimental session is made up of 2 halves. The first half lasts for 5 rounds, and the second half lasts for 10 rounds. Each round of the first half consists of one play of a simple investment game, which is described below. Each round of the second half also consists of one play of an investment game, which may be the same as the game from the first half, or it may be different. That game will be described after the first half has ended.

The investment games are played between 2 players, called **Investor** and **Allocator**. Before the first round begins, each of the participants is randomly assigned one of these roles; half will be **Investors** and half will be **Allocators**. Participants will remain in the same role throughout the experimental session.

In each round, you will be randomly matched to a player of the opposite role. You will not be told the identity of the person you are matched with in any round, nor will they be told your identity—even after the end of the session.

The **sequence of play** in a round is as follows:

1. The **Investor** has 2 points and chooses whether to Invest or Not Invest them.
2. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them; after this, the round ends.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.

So, if you are an **Investor**, your score in each round will depend on your choice and, in some cases, the choice of the person you are matched with. If you are an **Allocator**, your score in each round will depend on the choice of the person you are matched with, and, in some cases, your choice.

Payments: At the end of the experimental session, two rounds are chosen randomly —one from the first half and one from the second half. Each participant receives, in pounds, the total number of points he/she earned in those two rounds. Each participant additionally receives £5 for completing the session. Payments are made in cash at the end of the session.

Instructions—second part of experiment

The procedure in this half of the experiment is very similar to that in the first half. Your role will be the same as in the first half. In each round, you will be randomly matched to a player of the other role. The only difference is that the investment game has an additional stage. Before the **Investor** makes a choice, the **Investor** can learn about the **Allocator's previous decision** in the investment game in **this second part** of the experiment from the **Allocator's previous Investor**.

The **sequence of play** in a round is now as follows:

0. The **Investor** sees the information about the **Allocator's last choice** (if made) from the **Allocator's previous Investor** (if any), then chooses whether to Invest or Not Invest the 2 points.
1. If the **Investor** chooses Not Invest, the round ends, and the **Allocator** has no further decision to make. If the **Investor** chooses Invest, then the investment is successful, yielding 8 points. The **Allocator** chooses whether to Split these 8 points or Keep them. After this choice is made, the round ends.
2. The **Investor** can send information to the **Allocator's next Investor** about the **Allocator's choice in this round** if made. If, in the current round, the **Investor** does not invest and the **Allocator** does not make a choice, the **Investor** can forward information received from the **Allocator's previous Investor**.

Rules of the information:

- The **Investor** can send the following information about the **Allocator's last choice** (if made):
  1) The **Allocator** has kept the returns of investment OR
  2) The **Allocator** has split the returns of investment OR
  3) The **Allocator** has not had to make a decision yet.
- It is not possible for the **Investor** to send no information at all.

Scoring:

- If the **Investor** chooses Not Invest, then the **Investor** earns 2 points and the **Allocator** earns 0 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Split, then the **Investor** earns 4 points and the **Allocator** earns 4 points.
- If the **Investor** chooses Invest, and the **Allocator** chooses Keep, then the **Investor** earns 0 points and the **Allocator** earns 8 points.