

Appendix for

“The Hired Gun Mechanism”

By James Andreoni and Laura Gee

Supplemental Material
Not Intended for Publication

1. Instructions for LPG-GH game
2. Sample computer screens seen by subjects

3. **Welcome to the Economics Study!**

This experiment is a study of group and individual investment behavior. The instructions are simple. If you follow them carefully and make good investment decisions then you may earn a considerable amount of money. If you have any questions about the instructions please raise your hand and someone will come and speak with you privately about your question.

The experiment will last about an hour.

The Experiment

You have been organized into groups of 4 people. Each group will consist of 4 different randomly assigned persons in each period. There will be 20 **periods** in this session. In each period you will be required to make some decisions and what you earn from each decision will depend on what you and the other 3 people in your group decide.

Once all your decisions in the 20 periods have been made, we will randomly select one of the 20 periods as the **period-that-counts**. We will use the period-that-counts to determine your actual earnings. Note, since all periods are equally likely to be chosen, you should make your decision in each period as if it will be the period-that-counts.

First, we will describe the instructions for the first 10 periods.

First 10 Periods: Investment Decision

At the beginning of each period you will be randomly assigned to a new group of 4 players, and you will be given an automatic payment of \$1.00.

In each period you will be choosing how to divide 5 tokens between two investment opportunities:

THE RED INVESTMENT

Each token you invest in the **RED** investment will earn you a return of **\$3.00**.

Example: Suppose you invest 4 tokens in the **RED** investment, then you would earn **\$ 12.00** from this investment.

Example: Suppose you invest 0 tokens in the **RED** investment, then you would earn **\$ 0.00** from this investment.

THE BLUE INVESTMENT

What you earn from the **BLUE** investment will depend on the total number of tokens that you and the other 3 members of your group invest in the **BLUE** investment. The more the group invests in the **BLUE** investment, the more each member of the group earns.

Each token you invest in the **BLUE** investment will earn you and all your group members a return of **\$2.00**.

The process is best explained by a number of examples.

Example: Suppose that you decided to invest no tokens in the **BLUE** investment but that the 3 other members invest a total of 9 tokens. Then your earnings from the **BLUE** investment would be **\$18.00** (which is 9 tokens multiplied by \$2.00). Everyone else in your group would also earn **\$ 18.00**.

Example: Suppose that you invest 2 tokens in the **BLUE** investment and that the 3 other members of your group invest a total of 9 tokens. This makes a group total of 11 tokens. Your return from the **BLUE** investment would be **\$22.00** (which is 11 tokens multiplied by \$2.00). The other 3 members of the group would also get a return of **\$ 22.00**.

Example: Suppose that you invest 3 tokens in the **BLUE** investment and the other 3 members invest nothing. Then you, and everyone else in the group, would get a return from the **BLUE** investment of **\$6.00** (which is 3 tokens multiplied by \$ 2.00).

As you can see, every token invested in the **BLUE** investment will earn **\$2.00** for every member of the group, not just the person who invests it there. *It does not matter who invests tokens in the **BLUE** investment. Everyone will get a return from every token invested there—whether they invest tokens in the **BLUE** investment or not.*

YOUR TASK

Your task is to decide how many of your tokens to invest in the **RED** investment and how many to invest in the **BLUE** investment. You are free to invest some of your tokens in the **RED** investment and some in the **BLUE** investment. Alternatively, you can invest all of them into the **RED** investment or all of them into the **BLUE** investment.

Earnings

Once you and the other 3 members of your group have made your decisions, you will receive an **Earnings Statement** for that period. You will be given anonymous details of all your group's investments and earnings.

Your earnings have been computed using the following simple formula:

$$1^{\text{st}} \text{ Stage Earnings} = (\$3.00) * (\text{Your investment to the } \mathbf{RED} \text{ investment}) + (\$2.00) * (\text{Total group investments to the } \mathbf{BLUE} \text{ investment})$$

For example imagine you invested 4 to the **BLUE** investment, your other group members invest 2, 3, and 3 to the **BLUE** investment.

In this example 1st stage earnings are computed as follows:

$$1^{\text{st}} \text{ Stage Earnings} = (\$3.00) * (5-4) + (\$2.00) * (4 + 2 + 3 + 3)$$
$$1^{\text{st}} \text{ Stage Earnings} = (\$3.00) * (1) + (\$2.00) * (12)$$
$$1^{\text{st}} \text{ Stage Earnings} = \$3.00 + \$24.00$$
$$1^{\text{st}} \text{ Stage Earnings} = \$ 27.00$$

Your earnings will be your 1st Stage earnings plus your \$1.00 automatic payment. You will also be given a summary of your current and previous earnings.

You must make your investment decisions without knowing what the others in your group are deciding. Do not discuss your decision with any other participant.

Your Group

For each decision period you will be in a group of 4 people in the room today. **After each decision period we will randomly re-match you with a new group of 4 people in the room.** As a result, each decision you make will be with a new group of 4 participants. The probability that you will ever be in the same group of 4 participants again is extremely remote.

After 10 periods of this one stage investment decision, you will be given directions for another type of decision.

Things to remember

- You will be in a group of 4 people
- You will have automatic earnings of \$1.00 each period
- You will have 5 tokens to invest each period
- Each token you invest in the **RED** investment earns you **\$3.00**
- Each token you invest in the **BLUE** investment earns you and every member of your group **\$2.00**
- The groups will be randomly re-matched every decision period.
- Please feel free to use the calculator, and scratch paper provided to help you with your calculations.

If you have any questions about the instructions please raise your hand and someone will come and speak with you privately about your question.

Thank you.
Please wait to be told when you can begin making decisions
for the first 10 periods.

Next 10 Periods: Investment Decision with Administrator

Investment Decision

The investment decision is exactly the same as the decision you made in the first 10 periods.

At the beginning of each period you will be randomly assigned to a new group of 4 players, and you will be given an automatic payment of \$0.50.

In each period you will be choosing how to divide 5 tokens between two investment opportunities:

THE RED INVESTMENT

Each token you invest in the RED investment will earn you a return of \$3.00.

THE BLUE INVESTMENT

Each token you invest in the BLUE investment will earn you a return of \$2.00 for you and all the members of your group.

Administrator

In these 10 periods your group will be overseen by a *computer-simulated* Administrator, the Administrator will examine the number of tokens you invest in the BLUE investment. The computer-simulated Administrator may take a deduction from your payoff according to these rules:

1. Only the lowest investor (or investors in case of a tie) to the BLUE investment will have a deduction taken from their payoff by the Administrator.
2. The size of the deduction will depend on the investment choices of your group members. The deduction will be the difference between the payoff of the lowest investor and the payoff of the second lowest investor to the BLUE investment in your group plus \$3.00.
3. If there is a tie for the lowest investor, all those who tied will have the deduction taken from their payoff.
4. If all 4 members of your group tie for the lowest investor, then all of you will have \$3.00 taken from your payoffs.
5. If all members of your group allocate the whole of their 5 tokens to the BLUE investment, then no one will have a deduction taken from their payoffs.

Thus, with the Administrator the only way you can avoid having a deduction is to avoid being the lowest investor to the BLUE investment. With the Administrator, the only way everyone in the group can avoid a deduction is if everyone invests all 5 tokens to the BLUE investment.

Earnings:

Example: Suppose that you invest 3 tokens in the RED investment and 2 tokens in the BLUE investment. Suppose that the 3 other members of your group invest 4, 4, and 1 tokens in the BLUE investment respectively. This makes a group total of 11 tokens. Your return from the BLUE investment would be \$22.00. The other 3 members of the group would also get a return of \$ 22.00 from the BLUE investment. Your initial payoff from this stage would be:

$$3 * (\$3.00) + (2 + 4 + 4 + 1) * (\$2.00) = \$ 31.00$$

You invested 2 tokens to the BLUE investment, while another player invested only 1 token, so you are **not** the lowest investor to the BLUE investment. Thus, you will **not** have a payoff deduction. Your earnings for Stage 2 of this period will be your initial earnings of \$31.00.

Example: Suppose that you invest 3 tokens in the RED investment and 2 tokens in the BLUE investment. Suppose that the 3 other members of your group invest 3, 4, and 2 tokens in the BLUE investment respectively. This makes a group

total of 11 tokens. Your return from the **BLUE** investment would be **\$22.00**. The other 3 members of the group would also get a return of **\$22.00** from the **BLUE** investment. Your initial payoff from this stage would be:

$$3 * (\$3.00) + (2 + 3 + 4 + 2) * (\$2.00) = \$31.00$$

You invested 2 tokens to the **BLUE** investment, so you and the other player that invested 2 tokens tied for being the lowest investors to the **BLUE** investment. Thus, you (and the other player that invested only 2 in the **BLUE** investment) will have a payoff deduction. The size of the deduction will be \$3.00 plus the difference between your initial earnings and the next lowest investor in the **BLUE** investment. The next lowest investor in your group invested 3 tokens in the **BLUE** investment and earned \$ 28.00. In this example that would mean your deduction would be $\$3.00 + (\$31.00 - \$28.00) = \6.00 . Your Stage 2 net earnings will be your initial earnings of \$31.00 minus your deduction of \$6.00, which in total equals \$25.00. You will be told that you were the lowest investor when your period earnings are reported to you.

Example: Suppose that you invest 0 tokens in the **RED** investment and 5 tokens in the **BLUE** investment. Suppose that the 3 other members of your group invest 5, 5, and 5 tokens in the **BLUE** investment respectively. This makes a group total of 20 tokens. Your return from the **BLUE** investment would be **\$40.00**. The other 3 members of the group would also get a return of **\$40.00** from the **BLUE** investment.

Everyone invested *all* their 5 tokens to the **BLUE** investment, so there is no lowest investor to the **BLUE** investment. In this specific case even though there is a computer simulated Administrator, no one will have a payoff deduction. Your payoff for Stage 2 of this period will be \$40.00.

Your earnings for the last 10 periods are computed by the following formula:

$$\text{Earnings} = (\$3.00) * (\text{Your investment to the RED investment}) + (\$2.00) * (\text{Total group investments to the BLUE investment}) - (\text{Payoff Deduction if you are the lowest investor to the BLUE investment})$$

Your Group

For each decision period you will be in a group of 4 people in the room today. As a result, each period you will be with a new group of 4 participants. The probability that you will ever be in the same group of 4 participants again is extremely remote.

Your Earnings

Once all your decisions in the 20 periods have been made, we will randomly select one of the 20 periods as the period-that-counts. We will use the period-that-counts to determine your actual earnings. Note, since all periods are equally likely to be chosen, you should make all your decision in each period as if it will be the period-that-counts.

Things to Remember

- You will be in a group of 4 people
- You will have automatic earnings of \$1.00 each period
- You will have 5 tokens to invest each period
- Each token you invest in the **RED** investment earns you **\$3.00**
- Each token you invest in the **BLUE** investment earns you and every member of your group **\$2.00**
- The groups will be randomly re-matched every decision period.
- Your group will be monitored by a computer-simulated Administrator
 - The Administrator will be responsible for taking a deduction from the earnings of the lowest investor in the **BLUE** investment.
 - The deduction will equal to (the earnings of the lowest **BLUE** investor) – (the earnings of the second lowest **BLUE** investor) + \$3.00.
 - If several people are tied for the lowest investor, all will receive a deduction from their earnings.
 - If all people in the group invest all 5 tokens in the **BLUE** investment, then no one will receive a deduction.
- Please feel free to use the calculator, and scratch paper provided to help you with your calculations.

If you have any questions about the instructions please raise your hand and someone will come and speak with you privately about your question

Thank you.
Please wait to be told when you can begin making decisions
for the next 10 periods.

Screenshots for The Hired Gun Mechanism

LPG (1)

Period

1 out of 10

You have 5 tokens for this stage of the study.

You also have been given \$1.00 for participating in this period. This amount will be added to your final payment.

Tokens in the **RED** investment earn \$3.00 for you, and \$0.00 for all your other group members.

Tokens in the **BLUE** investment earn \$2.00 for you and for **all your other group members**.

Use the box to indicate how many of your 5 tokens will be invested in the **RED** investment.

Use the box to indicate how many of your 5 tokens will be invested in the **BLUE** investment.

LPG (2)

Period

1 out of 10

Player	RED investment:	BLUE investment:	Initial Earnings
Player 1	5	0	35.00
Player 2	0	5	20.00
Player 3	3	2	29.00
You	2	3	26.00
Total		10	

OK

LPG (3)

Period

1 out of 10

RESULTS (Stage 1 of 1):

RED investment: 2

BLUE investment: 3

Total Tokens in BLUE investment: 10

Automatic Payment: 1.00

Your Earnings This Period: 27.00

Period	Automatic Payment:	RED Investment	BLUE Investment	Total Tokens In BLUE Investment	Earnings
1	1.00	2	3	10	27.00

OK

GH(1)

Period

1 out of 10

You have 5 tokens for this stage of the study.

You also have been given \$0.50 for participating in this period. This amount will be added to your final payment.

Recall your group's **Administrator will take a deduction** from the lowest investor to the **BLUE** investment.

Tokens in the **RED** investment earn \$3.00 for you, and \$0.00 for all your other group members.

Tokens in the **BLUE** investment earn \$2.00 for you and for **all your other group members**.

Use the box to indicate how many of your 5 tokens will be invested in the **RED** investment.

Use the box to indicate how many of your 5 tokens will be invested in the **BLUE** investment.

OK

GH(2)

Period

1 out of 10

Player	RED investment:	BLUE investment:	Initial Earnings	Deduction	Initial Earnings - Deduction
You	0	5	34.00	0.00	34.00
Player 2	0	5	34.00	0.00	34.00
Player 3	2	3	40.00	6.00	34.00
Player 4	1	4	37.00	0.00	37.00
Total		17			

OK

GH(3) - lowest

Period

1 out of 10

You were the lowest **BLUE** investor this period, and so a deduction of \$6.00 has been taken from your Stage 2 earnings.

RESULTS:

RED investment: 2

BLUE investment: 3

Total Tokens in **BLUE** investment: 17

Initial Earnings 40.00

Deduction: 6.00

Net Earnings 34.00

Your Earnings This Period 34.50

Period	Automatic Payment:	RED Investment	BLUE Investment	Total Tokens In BLUE Investment	Initial Earnings	Amount of Deduction	Net Earnings	Earnings
1	0.50	2	3	17	40.00	6.00	34.00	34.50

OK

GH(3) – not lowest

Period
1 out of 10

You were not the lowest BLUE investor this period, and so \$0.00 has been taken from your earnings.

RESULTS:
RED investment: 0
BLUE investment: 5
Total Tokens in BLUE investment: 17
Initial Earnings 34.00
Deduction: 0.00
Your Net Earnings: 34.00
Your Earnings This Period: 34.50

Period	Automatic Payment:	RED Investment	BLUE Investment	Total Tokens In BLUE Investment	Initial Earnings	Amount of Deduction	Net Earnings	Earnings
1	0.50	0	5	17	34.00	0.00	34.00	34.50

OK