

**Learning, Information and Sorting in Market Entry Games:
Theory and Evidence** John Duffy and Ed Hopkins

Instructions Used in the Three Experimental Treatments

The instructions used in the limited information, aggregate information and full information treatments are provided on the following pages for the benefit of the referees of the paper referenced above, and are not intended for publication.

[Instructions Used in the Limited Information Treatment]

Instructions

Overview

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions you might earn a considerable amount of money that will be paid to you in cash at the end of the session. If you have a question at any time, please feel free to ask the experimenter. We ask that you not talk with one another for the duration of the experiment.

Each of you are seated at computer workstations. You will use these computer workstations in all “rounds” of today’s session, entering your choices when prompted by your computer monitor. On your desks you should have a receipt, a pen and several record sheets. Your computer monitor currently reports your subject number. Please record this subject number at the top of your first record sheet, in the space provided.

In each round of the experiment, your computer monitor will ask you to make a choice between one of two possible actions. After all players have made their choices a second screen will appear which will report to you the “payoff” resulting from your choice. If the session has not yet ended, you will proceed to the next round, where you will once again be asked to make a choice between the two possible actions.

The Sequence of Play in a Round

The first computer screen you see in each round asks you to make a choice between two actions, “action X” or action “Y.” Enter your choice at the prompt using the keyboard. If you want to choose action X, type the letter x, and then press the Enter key. If you want to choose action Y, type the letter y and then press the Enter key.

After you have made and entered a choice, you are asked to confirm your choice. To confirm your choice, type y for yes, and press the Enter key. If you want to change your choice of action, type n for no at the confirm prompt and press the Enter key. You will then be returned to the first prompt, where you will be able to choose once again between action X or Y.

Please record your choice of action, X or Y, on your record sheet in the space next to the round

number.

Once all players have entered their choices and recorded these choices on their record sheets, a second screen will appear. This second screen will remind you of your action choice for the round and will report to you the payoff from this action choice. This payoff number represents an amount in dollars that may be paid to you in cash as will be explained below. Please record your payoff for the round on your record sheet under the column with the heading “Payoff.”

At the bottom of both the first and second screens you will see your own recent past history of action choices and payoffs. This information is updated at the beginning of every new round.

How you are paid

Following the completion of 25 rounds, we will pause for a moment to select one of the previous 25 rounds at random. We will do this by randomly drawing a number (an integer) from the interval $[1, 2, \dots, 25]$. Your payoff from this single round, in dollars, will be added to your total earnings for today’s session. Note that each of the 25 rounds you play has an equal chance of being chosen and you do not know in advance which of these 25 rounds will be chosen to determine your payoff. Once the randomly chosen number is announced, please circle the row of your record sheet corresponding to the chosen round number.

In today’s session we will play four 25–round “sets.” You will record information for each new 25 round set on a separate record sheet, beginning with round 1. Notice that each record sheet has room for recording information on just 25 rounds of play. Once each set of 25 rounds is complete we will again draw a random number from 1 to 25. Your payoff in dollars for that round, which you will circle on your record sheet, is added to your total earnings.

At the end of the session, we will ask you to total up your earnings in dollars from all four 25–round sets. Add to this sum your \$5 participation payment. Record the total amount on your receipt. All earning will be paid in cash at the end of the session.

ARE THERE ANY QUESTIONS BEFORE WE BEGIN?

[Instructions Used in Aggregate Information Treatment]

Instructions

Overview

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions you might earn a considerable amount of money that will be paid to you in cash at the end of the session. If you have a question at any time, please feel free to ask the experimenter. We ask that you not talk with one another for the duration of the experiment.

There are 6 participants in today's experiment. Each of you are seated at computer workstations. You will use these computer workstations in all "rounds" of today's session, entering your choices when prompted by your computer monitor. On your desks you should have a receipt, a pen and several record sheets. Your computer monitor currently reports your player number. Please record this player number at the top of your first record sheet, in the space provided.

In each round of the experiment, your computer monitor will ask you to make a choice between one of two possible actions. After all players have made their choices a second screen will appear which will report to you the "payoff" resulting from your choice. If the session has not yet ended, you will proceed to the next round, where you will once again be asked to make a choice between the two possible actions.

The Sequence of Play in a Round

The first computer screen you see in each round asks you to make a choice between two actions, action "X" or action "Y." You will enter your choice at the prompt using the keyboard. If you want to choose action X, type the letter x, and then press the Enter key. If you want to choose action Y, type the letter y and then press the Enter key.

After you have entered a choice, you are asked to confirm your choice. To confirm your choice, type y for 'yes', and press the Enter key. If you want to change your choice of action, type n for 'no' at the confirm prompt and press the Enter key. You will then be returned to the first prompt, where you will be able to choose once again between action X or Y.

Please record your choice of action, X or Y, on your record sheet in the space next to the round

number, under the heading “Action Choice”.

Once all players have entered their choices and recorded these choices on their record sheets, a second screen will appear. This second screen reminds you of your action choice for the round and informs you of your payoff for the round. The payoff number represents an amount in dollars that may be paid to you in cash as will be explained below. Please record your payoff for the round in the last column of your record sheet under the heading “My Payoff.”

This second screen also reveals the fraction of all 6 players who chose action X, and the fraction of all 6 players who chose action Y. Please record these two fractions on your record sheet under the headings “Fraction Choosing Action X”, “Fraction Choosing action Y”. Next to these fractions are the payoffs earned by each player choosing action X and by each player choosing action Y. You will also be informed of the payoff you would have received if you had chosen the other action (X, or Y) in the last round assuming that the other 5 players did not change their choice of action.

At the bottom of both the first and second screens you will see your own recent past history of action choices and payoffs. This information is updated at the beginning of every new round.

How payoffs are determined

Payoffs in every round of this game are determined as follows.

- If you choose action X, your payoff for the round is always \$8.
- If you choose action Y, your payoff for the round depends on the total number of players, including yourself, who choose action Y. Suppose that $n = 1, 2, 3, 4, 5$ or 6 represents the number of players who choose action Y. If you are one of these n players, your payoff for the round is given by:

$$\$8 + \$2 \times (2.1 - n)$$

For example, if you are the only player out of the group of 6 (1/6) who chooses action Y, then $n = 1$ and your payoff from choosing action Y would be $\$8 + \$2 \times (2.1 - 1) = \$8 + \$2.2 = \$10.20$. For another example, if all six players (6/6) choose action Y, then $n = 6$ and each player’s payoff from choosing action Y would be $\$8 + \$2 \times (2.1 - 6) = \$8 - \$7.80 = \$0.20$

The complete set of possible payoffs you can earn from choosing action Y in each round are provided in the following table which you may refer to at any time during the experiment.

Fraction of all 6 players who choose action Y:	1/6	2/6	3/6	4/6	5/6	6/6
Payoff each player earns from choosing action Y:	\$10.20	\$8.20	\$6.20	\$4.20	\$2.20	\$0.20

These payoff possibilities from playing action X or action Y will remain the same over all rounds of today's experimental session, and are written on the chalkboard for all to see.

Are there any questions about how action choices determine payoffs?

How you are paid

Following the completion of 25 rounds, we will pause for a moment to select one of the previous 25 rounds at random. We will do this by randomly drawing a number (an integer) from the interval $[1, 2, \dots, 25]$. Your payoff from this single round, in dollars, will be added to your total earnings for today's session. Note that each of the 25 rounds you play has an equal chance of being chosen and you do not know in advance which of these 25 rounds will be chosen to determine your payoff. Once the randomly chosen number is announced, please circle the row of your record sheet corresponding to the chosen round number.

In today's session we will play four 25-round "sets." You will record information for each new 25 round set on a separate record sheet, beginning with round 1. Notice that each record sheet has room for recording information on just 25 rounds of play. Once each set of 25 rounds is complete we will again draw a random number from 1 to 25. Your payoff in dollars for that round, which you will circle on your record sheet, is added to your total earnings.

At the end of the session, we will ask you to total up your earnings in dollars from all 25-round sets that have been played. Record the total amount on your receipt. All earnings will be paid in cash at the end of the session.

ARE THERE ANY QUESTIONS BEFORE WE BEGIN?

[Instructions Used in Full Information Treatment]

Instructions

Overview

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions carefully and make good decisions you might earn a considerable amount of money that will be paid to you in cash at the end of the session. If you have a question at any time, please feel free to ask the experimenter. We ask that you not talk with one another for the duration of the experiment.

There are 6 participants in today's experiment. Each of you are seated at computer workstations. You will use these computer workstations in all "rounds" of today's session, entering your choices when prompted by your computer monitor. On your desks you should have a receipt, a pen and several record sheets. Your computer monitor currently reports your player number. Please record this player number at the top of your first record sheet, in the space provided.

In each round of the experiment, your computer monitor will ask you to make a choice between one of two possible actions. After all players have made their choices a second screen will appear which will report to you the "payoff" resulting from your choice. If the session has not yet ended, you will proceed to the next round, where you will once again be asked to make a choice between the two possible actions.

The Sequence of Play in a Round

The first computer screen you see in each round asks you to make a choice between two actions, action "X" or action "Y." You will enter your choice at the prompt using the keyboard. If you want to choose action X, type the letter x, and then press the Enter key. If you want to choose action Y, type the letter y and then press the Enter key.

After you have entered a choice, you are asked to confirm your choice. To confirm your choice, type y for 'yes', and press the Enter key. If you want to change your choice of action, type n for 'no' at the confirm prompt and press the Enter key. You will then be returned to the first prompt, where you will be able to choose once again between action X or Y.

Please record your choice of action, X or Y, on your record sheet in the space next to the round

number, under the heading “Action Choice”.

Once all players have entered their choices and recorded these choices on their record sheets, a second screen will appear. This second screen reminds you of your action choice for the round and informs you of your payoff for the round. The payoff number represents an amount in dollars that may be paid to you in cash as will be explained below. Please record your payoff for the round in the last column of your record sheet under the heading “My Payoff.”

This second screen also reveals the fraction of all 6 players who chose action X, and the fraction of all 6 players who chose action Y. Please record these two fractions on your record sheet under the headings “Fraction Choosing Action X”, “Fraction Choosing action Y”. Next to these fractions are the payoffs earned by each player choosing action X and by each player choosing action Y. You will also be informed of the payoff you would have received if you had chosen the other action (X, or Y) in the last round assuming that the other 5 players did not change their choice of action.

At the start of the next round, the bottom of your screen will remind you of your own past actions and payoffs and will also reveal the actions chosen by each of the other 5 players in the just completed round as well as in all past rounds. For example, if you are player number 3, you might see that in the just completed round, the other 5 players’ choices were:

1X 2Y 4X 5X 6Y

which indicates that player number 1 chose X, player number 2 chose Y, player numbers 4 and 5 both chose X, and player number 6 chose Y. Player numbers do not change over the entire session, so you will know the choices that each player has made in each prior round, before you have to make an action choice in the new round. Players will only be identified by these player numbers; you will not know the names of the players associated with the player numbers, even after the experiment is over.

How payoffs are determined

Payoffs in every round of this game are determined as follows.

- If you choose action X, your payoff for the round is always \$8.
- If you choose action Y, your payoff for the round depends on the total number of players, including yourself, who choose action Y. Suppose that $n = 1, 2, 3, 4, 5$ or 6 represents the number

of players who choose action Y. If you are one of these n players, your payoff for the round is given by:

$$\$8 + \$2 \times (2.1 - n)$$

For example, if you are the only player out of the group of 6 ($1/6$) who chooses action Y, then $n = 1$ and your payoff from choosing action Y would be $\$8 + \$2 \times (2.1 - 1) = \$8 + \$2.2 = \$10.20$. For another example, if all six players ($6/6$) choose action Y, then $n = 6$ and each player's payoff from choosing action Y would be $\$8 + \$2 \times (2.1 - 6) = \$8 - \$7.80 = \$0.20$

The complete set of possible payoffs you can earn from choosing action Y in each round are provided in the following table which you may refer to at any time during the experiment.

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In today's session we will play four 25-round "sets." You will record information for each new 25 round set on a separate record sheet, beginning with round 1. Notice that each record sheet has room for recording information on just 25 rounds of play. Once each set of 25 rounds is complete we will again draw a random number from 1 to 25. Your payoff in dollars for that round, which you will circle on your record sheet, is added to your total earnings.

At the end of the session, we will ask you to total up your earnings in dollars from all 25-round sets that have been played. Record the total amount on your receipt. All earnings will be paid in

cash at the end of the session.

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