

McKelvey, R. D. and Palfrey, T. R. (1992). An experimental study of the centipede game. *Econometrica*

Experiment Instructions

This is an experiment in group decision making, and you will be paid for your participation in cash, at the end of the experiment. Different subjects may earn different amounts. What you earn depends partly on your decisions, partly on the decisions of others, and partly on chance.

The entire experiment will take place through computer terminals, and all interaction between you will take place through the computers. It is important that you not talk or in any way try to communicate with other subjects during the experiments. If you disobey the rules, we will have to ask you to leave the experiment.

We will start with a brief instruction period. During the instruction period, you will be given a complete description of the experiment and will be shown how to use the computers. You must take a quiz after the instruction period. So it is important that you listen carefully. If you have any questions during the instruction period, raise your hand and your question will be answered so everyone can hear. If any difficulties arise after the experiment has begun, raise your hand, and an experimenter will come and assist you.

The subjects will be divided into two groups, containing 10 subjects each. The groups will be labeled the RED group and the BLUE group. To determine which color you are, will you each please select an envelope as the experimenter passes by you.

[EXPERIMENTER PASS OUT ENVELOPES]

If you chose BLUE, you will be BLUE for the entire experiment. If you chose RED, you will be RED for the entire experiment. Please remember your color, because the instructions are slightly different for the BLUE and the RED subjects.

In this experiment, you will be playing the following game, for real money.

First, you are matched with an opponent of the opposite color. There are two piles of money: a Large Pile and a Small Pile. At the beginning of the game the Large Pile has 40 cents and the Small Pile has 10 cents.

RED has the first move and can either "Pass" or "Take." If RED chooses "Take," RED gets the Large Pile of 40 cents, BLUE gets the small pile of 10 cents, and the game is over. If RED chooses "Pass," both piles double and it is BLUE's turn.

The Large Pile now contains 80 cents and the Small Pile 20 cents. BLUE can take or pass. If BLUE takes, BLUE ends up with the Large Pile of 80 cents and RED ends up with the Small Pile of 20 cents and the game is over. If BLUE passes, both piles double and it is RED's turn again. This continues for a total of six turns, or three turns for each player. On each move, if a player takes, he or she gets the Large Pile, his or her opponent gets the Small Pile, and the game is over. If the player passes, both piles double again and it is the other player's turn.

The last move of the game is move six, and is BLUE's move (if the game even gets this far). The Large Pile now contains \$12.80 and the Small Pile contains \$3.20. If BLUE takes, BLUE gets the Large Pile of \$12.80 and RED gets the Small Pile of \$3.20. If BLUE passes, then the piles double again. RED then gets the Large Pile, containing \$25.60, and BLUE gets the Small Pile, containing

\$6.40. This is summarized in the following table.

PAYOFF CHART FOR DECISION EXPERIMENT

		<i>Move #</i>				Large	Small	RED's	BLUE's
1	2	3	4	5	6	Pile	Pile	Payoff	Payoff
T						0.40	0.10	0.40	0.10
P	T					0.80	0.20	0.80	0.20
P	P	T				1.60	0.40	1.60	0.40
P	P	P	T			3.20	0.80	3.20	0.80
P	P	P	P	T		6.40	1.60	6.40	1.60
P	P	P	P	P	T	12.80	3.20	12.80	3.20
P	P	P	P	P	P	25.60	6.40	25.60	6.40

[EXPERIMENTER HAND OUT PAYOFF TABLE]

Go over table to explain what is in each column and row.

The experiment consists of 10 games. In each game, you are matched with a different p the opposite color from yours. Thus, if you are a BLUE player, in each game, you will be with a RED player. If you are a RED player, in each game you are matched with a BLUE.

Since there are ten subjects of each color, this means that you will be matched with each of the subjects of the other color exactly once. So if your label is RED, you will be matched with each of the BLUE subjects exactly once. If you are BLUE, you will be matched with each of the RED subjects exactly once.

We will now begin the computer instruction session. Will all the BLUE subjects please move to the terminals on the left side of the room, and all the RED subjects move to the terminals on the right side of the room.

[SUBJECTS MOVE TO CORRECT TERMINALS]

During the instruction session, we will teach you how to use the computer by going through a few practice games. During the instruction session, do not hit any keys until you are told to do so, and when you are told to enter information, type exactly what you are told to type. You are not paid for these practice games.

Please turn on your computer now by pushing the button labeled "MASTER" on the right hand side of the panel underneath the screen.

[WAIT FOR SUBJECTS TO TURN ON COMPUTERS]

When the computer prompts you for your name, type your full name. Then hit the ENTER key.

[WAIT FOR SUBJECTS TO ENTER NAMES]

When you are asked to enter your color, type R if your color is RED, and B if your color is BLUE. Then hit ENTER.

[WAIT FOR SUBJECTS TO ENTER COLORS]

You now see the experiment screen. Throughout the experiment, the bottom of the screen will tell you what is currently happening, and the top will tell you the history of what happened in the previous games. Since the experiment has not begun yet, the top part of the screen is currently empty. The bottom part of the screen tells you your subject number and your color. It also tells you the subject number of the player you are matched against in the first game. Is there anyone whose color is not correct?

[WAIT FOR RESPONSE]

Please record your color and subject number on the top left hand corner of your record sheet. Also record the number of the subject you are matched against in the first game.

Each game is represented by a row in the upper screen, and the player you will be matched with in each of the ten games appears in the column labeled "OPP" (which stands for "opponent") on the right side of the screen. It is important to note that you will never be paired with the same player twice.

We will now start the first practice game. Remember, do not hit any keys until you are told to do so.

[MASTER HIT KEY TO START FIRST GAME]

You now see on the bottom part of the screen that the first game has begun, and you are told who you are matched against. If you are a RED player, you are told that it is your move, and are given a description of the choices available to you. If you are a BLUE player, you are told that it is your opponent's move, and are told the choices available to your opponent.

Will all the RED players now choose PASS by typing in P on your terminals now.

[WAIT FOR SUBJECTS TO CHOOSE]

Since RED chose P, this is recorded on the top part of the screen with a P in the first RED column, and the cursor has moved on to the second column, which is BLUE, indicating that it is BLUE's move.

On the bottom part of the screen, the BLUE players are now told that it is their turn to choose, and are told the choices they can make. The RED players are told that it is their opponent's turn to choose, and are told the choices that their opponent can make. Notice, that there is now a Large Pile of *.80andaSmallPileof.20*.

Will all the BLUE players now please choose TAKE by typing T at your terminal now.

[WAIT FOR SUBJECTS TO CHOOSE]

Since BLUE chose T, the first game has ended. On the bottom part of the screen, you are told that the game is over, and that the next game will begin shortly. On the top part of the screen, BLUE's move is recorded with a T in the second column. The payoffs from the first game for both

yourself and your opponent are recorded on the right hand side of the screen in the columns labeled "Payoff." Your own payoff is in your color. That of your opponent is in the opponent's color. Please record your own payoff on the record sheet that is provided.

[WAIT FOR SUBJECTS TO RECORD PAYOFFS]

You are not being paid for the practice session, but if this were the real experiment, then the payoff you have recorded would be money you have earned from the first game, and you would be paid this amount for that game at the end of the experiment. The total you earn over all ten real games is what you will be paid for your participation in the experiment. We will now proceed to the second practice game.

[MASTER HIT KEY TO START SECOND GAME]

You now see that you have been matched with a new player of the opposite color, and that the second game has begun. Does everyone see this?

[WAIT FOR RESPONSE]

The rules for the second game are exactly like the first. The RED player gets the first move.

[DO RED-P, BLUE-P, RED-P]

Now notice that it is BLUE's move. It is the last move of the game. The Large Pile now contains 3.20, and the Small Pile contains .80. If the BLUE player chooses TAKE, then the game ends. The BLUE player receives the Large Pile and the RED player receives the Small Pile. If the BLUE player chooses PASS, both piles double, and then the game ends. The RED player receives the Large Pile, which now contains 6.40, and the BLUE player receives the Small Pile, containing 1.60. Will the BLUE player please choose PASS by typing P at your terminal now.

[WAIT FOR SUBJECTS TO CHOOSE]

The second practice game is now over. Please record your payoff on the second line of your record sheet.

[WAIT FOR PLAYERS TO RECORD PAYOFFS]

[MASTER HIT KEY TO START THIRD GAME]

We now go to the third practice game. Notice again that you have a new op RED players please choose TAKE by typing T at your terminal now.

[SUBJECTS WAIT FOR PLAYERS TO CHOOSE]

Since the RED player chose TAKE on the first move, the game is over, and we pr next game. Since RED chose TAKE on the first move, BLUE did not get any chance to move. Please record your payoff for the third game on the third line of your record sheet.

[WAIT FOR PLAYERS TO RECORD PAYOFFS]

This concludes the practice session. In the actual experiment there will be ten ga three, and, of course, it will be up to you to make your own decisions. At the end of experiment ends and we will pay each of you privately, in cash, the TOTAL amount you have accumulated during all ten games, plus your guaranteed five dollar participation fee. No other person will be told how much cash you earned in the experiment. You need not tell any other participants how much you earned. Are there any questions before we pass out the quiz?

[EXPERIMENTER TAKE QUESTIONS]

O.K., then we will now have you take the quiz.

[PASS OUT QUIZ]

[EXPERIMENTER TAKE QUESTIONS]

[HAND QUIZZES BACK AND GO THRU CORRECT ANSWER]