

Appendix I
Sample instructions - 3×3 baseline treatment

This is an experiment in the economics of decision-making. Research foundations have provided funds for conducting this research. Your payoffs will depend on your decisions and the decisions of the other participants, as well as on chance. If you follow the instructions and make careful decisions, you may earn a considerable amount of money. The entire experiment should be complete within an hour and a half. At the end of the experiment you will be paid privately.

At this time, you will receive \$5 as a participation fee. Details of how you will make decisions will be provided below. During the experiment we will speak in terms of experimental tokens instead of dollars. Your payoffs will be calculated in terms of tokens and then translated at the end of the experiment into dollars at the following rate:

$$1 \text{ Token} = 1 \text{ Dollar}$$

The experiment is divided into 30 independent and identical trading periods. In each period, you will be asked to submit bids (prices at which you are willing to buy) and asks (prices at which you are willing to sell) for a single unit of an indivisible asset. Trades take place in a set of interconnected markets represented by a nine-person network. You will only be able to trade with participants to whom you are connected in this network.

The experiment starts by having the computer randomly assign each subject to one of three rows: top, middle or bottom. You have an equal probability of being assigned to each row and your row assignment will remain unchanged throughout the experiment. Before the start of each period, you will be randomly assigned to one of the positions in one of the networks. The positions are labeled with the letters *A* through *I*. The top row consists of positions (*A, B, C*), the middle row consists of positions (*D, E, F*), and the bottom row consists of positions (*G, H, I*).

Each period starts by having the computer randomly form nine-person networks by selecting one participant of type-*A*, one of type-*B*, one of type-*C*, and so on. If you were initially designated a top row player, you will be assigned to a top row position in one of the networks, and similarly if you are a middle or bottom row player. Your type (*A, B, C, D, E, F, G, H, I*) will be displayed in the top right hand corner of the program dialog window (see attachment 1).

The networks formed in each period depend solely upon chance and are independent of the networks formed in any of the other periods. That is, in any network each top-row participant is equally likely to be chosen as type-*A*, type-*B*, or type-*C* participant for that network, and similarly with middle- and bottom-row participants. Note again that your row assignment will remain unchanged throughout the experiment but your type and network may change from period to period. In each period, it depends solely on chance.

The network is displayed in the large window that appears in the center of the program dialog window (see attachment 1). A line segment between any two types indicates that they are connected and, hence, are allowed to trade. The arrowhead points from the seller to the buyer. In the network used in this experiment, each of the types in the middle row (*D, E, F*) can trade with all the types in the top and bottom rows, whereas

the types in the top row (*A, B, C*) and the bottom row (*G, H, I*) can only trade with the types in the middle row (*D, E, F*).

The asset is initially held by a computer-generated seller. The computer-generated seller is always willing to sell one unit of the asset for a price of zero tokens. In addition, there is a computer-generated buyer who is always willing to buy one unit of the asset at a price of 100 tokens. The computer-generated seller can only sell the unit to the types in the top row (*A, B, C*). The computer-generated buyer can only buy the unit from the types in the bottom row (*G, H, I*). Note that the computer-generated seller and buyer do not appear in the network displayed in the program dialog window (see attachment 1).

A trading period

Next, we will describe in detail the process that will be repeated in all 30 periods and the user interface that you will use to make your decisions. Each period starts by having the computer randomly form six-person networks by selecting one participant of each type (*A, B, C, D, E, F, G, H, I*). At the start of each period, each participant receives an endowment of 100 tokens. You will use these tokens to pay for the asset when you buy and will receive these tokens in exchange for the asset when you sell. The trading protocol is defined by the following rules.

All trades must move the asset “downward”:

- The types in the top row can only buy from the computer-generated seller and can only sell to the middle row. For example, type *A* can buy from the computer generated seller and can sell to types *D, E* or *F*.
- The types in the middle row can only buy from the top row and sell to the bottom row. For example, type *D* can buy from types *A, B* or *C* and sell to types *G, H* or *I*.
- The types in the bottom row can only buy from the middle row and sell to the computer-generated buyer. For example, type *G* can buy from types *D, E* or *F* and sell to the computer-generated buyer.

In each period, you will be asked to submit a single bid and a single ask to the sellers and buyers with whom you are allowed to trade:

- You will submit a single bid to the sellers to whom you are connected by the network, indicating the price at which you are willing to buy one unit of the asset.
- You will submit a single ask to the buyers to whom you are connected by the network, indicating the price at which you are willing to sell one unit of the asset.

When you are ready to make your decisions, use the mouse to position the cursor in the Bid Input field on the right of the dialog window (see attachment 1) and use the keyboard to enter the number (including decimals) of tokens between 0 and 100 that you wish to bid. You enter a price in the Ask Input field the same way. Once you have entered the bid and ask, confirm your decisions by clicking the Submit button. Once you have clicked the Submit button, your decisions cannot be revised.

When everyone has submitted their sealed bid and ask, you will observe the bids and asks of all other participants, the actual prices at which the asset was traded and the sequence of trades. This information is displayed in the large window that appears in the center of the dialog window (see attachment 2). Bids and asks are colored blue, and the actual prices at which the asset was traded are colored green. The letter to the left of each price indicates whether it is an ask (**A**) or a bid (**B**). Each bid is displayed above the type of participant who has submitted this bid, and each ask is displayed below the type of participant who has submitted this ask. The asks of the computer-generated seller and bids of the computer-generated buyer are indicated by **CA** and **CB**, respectively.

Trades are executed sequentially. First, trades between the computer-generated seller and the buyers in the top row take place, followed by trades between the seller in the top row and the buyers in the bottom row, followed by trades between the seller in the middle row and the buyers in the bottom row, and finally trades between the seller in the bottom row and the computer-generated buyer. At each stage, a trade occurs only if a buyer has submitted a bid that is at least as high as the seller's ask. If there is more than one bid that is greater than or equal to the asking price, the asset is transferred from the seller to the buyer with the highest bid. If two buyers tie for the highest bid, the asset will be assigned to one of the buyers at random. The buyer pays the seller the number of tokens equal to the average of the bid and ask. Trading stops at any stage where no buyer bids as much as the seller's ask. In that case, the asset remains with the seller.

This completes the first of 30 trading periods. To move on to the second period, press the OK button on the bottom right hand corner of the program dialog window (see attachment 2). Note that after one minute the program will move automatically to the second period, but you will always be able to review the results of this period later in the experiment by choosing it and clicking on the View Results button on the top right hand corner of the program dialog window (see attachment 2). After letting you observe the results of the first period, the second period will start by having the computer randomly forming new groups of participants in networks.

This process will be repeated until all the 30 independent and identical trading periods are completed. Throughout the experiment please pay careful attention to the messages window at the bottom of the program dialog window (see attachment 1). At the end of the last round, you will be informed the experiment has ended.

Payoffs

Your trading profit in each period can be summarized by the formula:

$$\text{trading profit} = (\text{sales revenue}) - (\text{cost}).$$

The cost is the actual price you paid if you bought the asset and zero otherwise. The sales revenue is the actual price you received if you sold the asset and zero otherwise. Your total earnings in each trading period are equal to your initial endowment of 100 tokens *plus* your trading profits, positive or negative.

Your final payoff in the experiment is determined as follows. At the end of the experiment, the computer will randomly select one period in which to execute the trades “for real”. The period selected depends solely on chance. If the number of tokens you earned in that period is less than 100, you will receive 10 tokens to keep. If the number of tokens you earned in that period is at least 100, you will receive that amount minus 90 tokens to keep. At the end of the experiment, the tokens will be converted into money. Each token will be worth \$1. You will receive your payment as you leave the experiment.

Rules

Please do not talk with anyone during the experiment. We ask everyone to remain silent until the end of the last round. Your participation in the experiment and any information about your earnings will be kept strictly confidential. Your payments receipt and participant form are the only places in which your name and social security number are recorded. If there are no further questions, you are ready to start. An instructor will approach your desk and activate your program.

Attachment 1

ExpClient

Server Host: Server Port:

Client ID:

Round:

Period in round:

You are a type- participant

Your Tokens Endowment:

Bid:

Ask:

CA: 0 **CA: 0** **CA: 0**

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graph TD; A((A)) --> D((D)); A --> E((E)); A --> F((F)); B((B)) --> D((D)); B --> E((E)); B --> F((F)); C((C)) --> D((D)); C --> E((E)); C --> F((F)); D((D)) --> G((G)); D --> H((H)); D --> I((I)); E((E)) --> G((G)); E --> H((H)); E --> I((I)); F((F)) --> G((G)); F --> H((H)); F --> I((I));
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CB: 100 **CB: 100** **CB: 100**

Please make your decisions

Attachment 2

ExpClient

X

Server Host: Server Port:

Client ID:

Round:

Period in round:

You are a type- participant

Your Tokens Endowment:

Bid:

Ask:

A CA: 0 B: 5 A: 10	B CA: 0 B: 15 A: 20	C CA: 0 B: 25 P: 12.5 A: 30 P: 42.5
D B: 35 A: 40	E B: 45 A: 50	F B: 55 A: 60 P: 72.5
G B: 65 CB: 100 A: 70	H B: 75 CB: 100 A: 80	I B: 85 CB: 100 A: 90 P: 95

End of period
 Your total earnings in this period are 100 tokens
 Please press OK and wait for the next period