

Instructions

Welcome! This is an economics experiment. Funding for this experiment has been provided by the National Science Foundation and Virginia Commonwealth University.

For today's session, you will receive a \$10 show-up fee. In addition, you will have the opportunity to earn money during the session. Your decisions are likely to considerably affect your earnings. If you follow the instructions and make good decisions, you can earn more money.

Caution: Talking or looking at others' screens is not allowed. Should you have any questions please raise your hand and an experimenter will come to you.

A. Overview. Today's session involves making production and consumption allocation decisions. At the beginning of the session you will be matched with other four participants in this room, labeled $a\#$, $b\#$, $c\#$ or $d\#$, where the $\#$ sign indicates a group number, 1 to 4. You will remain matched with these same people throughout the first portion of this session. The first part of this session consists of a series of 10 *periods*. In each period you will either make a costly *production decision* that affects another player's earnings or you and another participant will simultaneously make a *consumption allocation decision* that affects both of your earnings.

1. Period Structure: At the beginning of each period, the participants in your group will be randomly ordered 1st through 4th in sequence. Periods will consist of three *stages*. Following the third stage the period ends, earnings are calculated and the next period begins.

2. Production Decisions: In stages 1 and 2, a player makes a production decision for the player that precedes her in sequence. In stage 1, for example, the 2nd player decides whether or not to produce a unit for the 1st player. The 1st player in sequence makes no production decision.

3. Consumption Allocation Decisions: In the final stage 3, the 3rd and 4th players in sequence are each endowed with a unit and simultaneously decide whether to 'push' the unit to the other player or 'pull' it toward themselves.

4. Earnings: In stages 1 and 2, if a producer decides to produce a unit, it costs her 1 point. The preceding player, who consumes the unit, earns 3 points. For example, if in stage 2, the 3rd player decides to produce she incurs a cost of 1 point and the 2nd player earns 3 points by consuming the good. If 3rd player decides to not produce, she incurs a cost of 0 points, and 2nd player earns 0 points from consumption.

In the final stage the 3rd and 4th players simultaneously decide to either 'push' an existing unit to the other, or 'pull' it to themselves. If they both 'push' each player earns 1.5 points. If one 'pushes' and the other 'pulls', the 'pull' player earns 3 points, while the 'push' player earns 0 points. If they both 'pull' they each lose 0.5 points.

5. Some observations:

- a) The 1st player in sequence makes no production decisions.
- b) The 3rd player in sequence will make a production decision, but will have no opportunity to consume a good produced by another player.
- c) The 4th player in sequence will make no production decision. Rather, the 3rd and 4th players make a consumption allocation decision simultaneously.
- d) Each period players have a 1/4 chance of being 1st, 2nd, 3rd, or 4th.
- e) In the first part of this session your point earnings from all periods will be summed. The sum will be converted to cash at a rate of \$1 per point. You will earn this in addition to your \$10 appearance fee.

6. Screen Displays and the Sequence of Decisions. Figure 1 illustrates the screen for a participant *b3* at the beginning of period 2. The player is presented with the earnings for possible combinations of own production and consumption decisions. Notice that in this period player *b3* is 2nd in sequence.

Player	<i>b3</i>		
Period 2	Order in Sequence:	2 nd	
Earnings Possibilities (points)			
If you consume but don't produce			3
If you consume and produce			2
If you don't consume and don't produce			0
If you don't consume but produce			-1
Notes: The 1th payer CANNOT produce			
Decisions			
Produce?	<input type="radio"/>	Yes	<input type="button" value="Confirm"/>
	<input type="radio"/>	No	

Figure 1. Screen Display for a 2nd Player in Sequence.

Player *b3* must decide whether or not to produce. To make a decision she must click on the radio dial to the left of the 'Yes' or 'No' headings. Once the player is comfortable with her decision, she clicks 'confirm' to continue.

The screen display is different for the 3rd and 4th players in sequence. Figure 2 illustrates the screen for a participant *b3* when she is the 3rd player in sequence.

Player	<i>b3</i>		Time remaining	20 Seconds	
Period 2	Order in Sequence	<input type="button" value="3rd"/>			
Earnings Possibilities from Production					
Don't Produce	0 points		You		
Produce	-1 point				
Decisions			Push Pull		
Produce?	<input type="radio"/>	Yes	<input type="radio"/>	Push	
	<input type="radio"/>	No		<input type="radio"/>	Pull
			<input type="button" value="Confirm"/>		

		Other	
		Push	Pull
You	Push	1.5	3
	Pull	0	-0.5

Figure 2. Screen Display for the 3rd Player in Sequence.

Player *b3* must decide whether to produce or not. Also, she must choose to either 'push' an existing unit to the 4th player in sequence, or 'pull' it toward herself. Once the player is comfortable with her decision, she clicks 'confirm' to continue. The 4th player in sequence will be presented with only the right side of the screen shown in Figure 2.

This player makes no production decision, and decides only whether to ‘push’ a unit to the 4th player in sequence or ‘pull’ it toward herself.

After all players have completed decisions for the period, results are tabulated and illustrated. Figure 3 illustrates results for a period where *b3* was 2nd in sequence.

Order in Sequence: 2 nd		Earnings (points)
Actions		
1) Your action	Produce	-1.0
2) Next Player's action	Produce	3.0
This Period Earnings		2.0
Cumulative Earnings		4.0
Continue		

Figure 3. Display of Period Results for a 2nd Player in Sequence

In this period, *b3* chose to produce a unit. Subsequently, the 3rd player also chose to produce a unit that provides consumption to the 2nd player. As a consequence, player *b3* earned 2 points for the period. Earnings results for the 1st player will look the same, except that the 1st player makes no production decision. The bottom portion of a player’s screen displays period and cumulative earnings. Once the player has reviewed earnings she should press ‘continue’.

Figure 4 illustrates results for a period where *b3* was 3rd in sequence.

Order in Sequence: 3 rd		Earnings (points)
Actions		
1) Production Decision	Produce	-1.0
2) Push or Pull	Pull	
3) Other player	Push	3.0
This Period Earnings		2.0
Cumulative Earnings		4.0
Continue		

Figure 4. Display of Period Results for a 3rd Player in Sequence.

In this period, *b3* chose to produce a unit and chose ‘pull’ in the ‘push-pull’ game, while the 4th player ‘pushed.’ So *b3* incurred a cost of 1 point from producing and earned 3 points from the ‘push-pull’ game. On net then player *b3* earned 2 points for the period. Earnings results for the 4th player will look the same, except that the 4th player makes no production decision.

Questionnaire

Prior to beginning please complete the following questionnaire.

1. Suppose in period 2 you are paired with three other players. In period 3 will you be paired with the same or different players?
2. Suppose in period 3 you were the 3rd in sequence. In period 4 will you be the 3rd in sequence again? What about other players, will they keep their order in sequence?
3. In any period what is the chance that you are the 1st player in sequence?
4. If you are 1st in a sequence, what are your highest and lowest earnings? What should happen for you to earn the highest amount? What should happen for you to earn the lowest amount? How can earnings for the 1st player differ from those for the 2nd?
5. In any period what is the chance that you are the 2nd or 3rd player in sequence?
6. If you are 2nd or 3rd what are your highest and lowest earnings? What should happen for you to earn the highest amount? What should happen for you to earn the lowest amount?
7. In any period what is the chance that you are the 4th player in sequence?
8. If you are 4th in a sequence, what are your highest and lowest earnings? What should happen for you to earn the highest amount? What should happen for you to earn the lowest amount? How can earnings for the 3th player differ from those for the 4th?

Any questions?

Final Period

Overview: In this 11th and final period you will make production and consumption decisions as before with the following two differences

1. *New groups.* Until this moment, you have been paired with a constant group of four players. Now we will place you in a new group. Your new group will consist of people who have never been paired together.
2. *Increased Earnings.* We will *triple* the value of consumption and the cost of production. If a consumption unit is produced for you, you will earn 9 points. If you produce a unit for someone else, it will cost you 3 points.

Following this last period the session will end. The points that you earn in this final period will be converted to U.S. dollars at the rate \$1 per point. These earnings will be added to your appearance fee and your earnings from the first portion of this session.

Any questions?