

## ONLINE APPENDIX

Paying to Match: Decentralized Markets with Information Friction

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June 2026

### Sample Instructions

**Welcome.** Welcome to EBEL and thank you for participating in today's experiment. Please place all of your personal belongings away so that we can have your complete attention. Please use the laptops as instructed. In particular, please do not attempt to browse the web or use programs unrelated to the experiment.

**Guidelines.** You will be paid in private and in cash at the end of the experiment. The amount that you ultimately earn in the experiment depends on your decisions, the decisions of others, and random chance. You have each earned a \$10 payment for showing up on time. You will be using laptops for the entire experiment, and all interactions between yourself and others will take place via the laptop's terminal. Please DO NOT socialize or talk.

**Overview.** Today's experiment is about matching. The main part of the experiment consists of 11 rounds: one practice round and 10 actual rounds. We will also ask you to complete several simple tasks at the end.

At the beginning of the experiment, you will be randomly assigned a role: either a color or a food. **Your role will remain fixed** across all rounds of the experiment. At the beginning of each round, you will be randomly assigned a type:

- If you are a color, you can be one of three types: Blue, Crimson, or White.
- If you are a food, you can be one of three types: Kiwi, Mango, or Plum.

Your type (but not your role) may change across each round of the experiment.

In each round, you will be randomly assigned to a group of six: three colors (one Blue, one Crimson, and one White) and three foods (one Kiwi, one Mango, and one Plum). Your goal in each round is to match with an individual from the opposite role. **If you are a color, your goal is to match with a food. If you are a food, your goal is to match with a color.**

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

**Match Payoff.**

A color and food who match together earn a **match payoff** (in tokens). **You will earn a different payoff depending on whom you match with and how you choose to split the match payoff.**

**Example 1:**

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

Blue and Mango can match together, with the **sum of payoffs** for Blue and Mango yielding **16 tokens**. For example, Blue could receive a payoff of 10 tokens and Mango would then receive a payoff of 6 tokens. Another example: Blue could receive a payoff of 7 tokens and Mango would then receive a payoff of 9 tokens.

**Example 2:**

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

Crimson and Plum can match together, with the **sum of payoffs** for Crimson and Plum yielding **48 tokens**. For example, Crimson could receive a payoff of 30 tokens and Plum would then receive a payoff of 18 tokens. Another example: Crimson could receive a payoff of 23 tokens and Plum would then receive a payoff of 25 tokens.

**Example 3:**

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

White and Kiwi can match together, with the **sum of payoffs** for White and Kiwi yielding **24 tokens**. For example, White could receive a payoff of 18 tokens and Kiwi would then receive a payoff of 6 tokens. Another example: White could receive a payoff of 9 tokens and Kiwi would then receive a payoff of 15 tokens.

**Information about the payoff matrix.** At the beginning of each round, we will reshuffle the rows and columns of the matrix.

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

**Examples:**

	KIWI	MANGO	PLUM
BLUE	8	16	24
CRIMSON	16	32	48
WHITE	24	48	72

	KIWI	MANGO	PLUM
BLUE	24	16	8
CRIMSON	48	32	16
WHITE	72	48	24

	KIWI	MANGO	PLUM
BLUE	16	32	48
CRIMSON	24	48	72
WHITE	8	16	24

	KIWI	MANGO	PLUM
BLUE	48	32	16
CRIMSON	72	48	24
WHITE	24	16	8

All possible reshufflings are equally likely. At the beginning of each round, you will not know how the matrix was reshuffled, but you will know which payoffs you might receive.

**Examples.** Suppose you are Blue, and you learn that your payoffs might be 16, 32, 48. It might be that a match with Kiwi generates 16, a match with Mango generates 32, and a match with Plum generates 48.

	KIWI	MANGO	PLUM
BLUE	16	32	48
CRIMSON	24	48	72
WHITE	8	16	24

It might be that a match with Kiwi generates 48, a match with Mango generates 32, and a match with Plum generates 16.

All possible reshufflings are equally likely. While you will know your possible payoffs, you will not know which payoff corresponds to which matching. Your payoffs will appear on the top

	KIWI	MANGO	PLUM
BLUE	48	32	16
CRIMSON	72	48	24
WHITE	24	16	8

part of your interface. Note that no other subject in your group observes your possible match payoffs. Each person only sees his or her own possible match payoffs.

**Rules of the Experiment.** In each round, you will start off unmatched. You are free to make at most one match proposal to any individual of the opposite role at any given time.

A match proposal must specify what your partner will get. If your proposal is accepted, then you will get the **match payoff minus what your partner will get**. You are also free to accept or reject match proposals that you receive from other individuals. Any match proposal that is not accepted or rejected **within 10 seconds** will automatically disappear. When a match is accepted, both the proposer and the receiver see the payoffs they get from the match.

**Example 1:** Suppose you are Blue, and you know your possible match payoffs are 16, 32, and 48. If you make an offer of 10 to Kiwi, which gets accepted, you might see that you get 6 and Kiwi gets 10. This implies that you and Kiwi have a match payoff of  $6+10 = 16$ .

**Example 2:** Suppose you are Blue, and you know your possible match payoffs are 16, 32, and 48. If you make an offer of 10 to Kiwi, which gets accepted, you might see that you get 38 and Kiwi gets 10. This implies that you and Kiwi have a match payoff of  $38+10 = 48$ .

**You are Crimson.**

Your possible surpluses are 16, 32, or 48  
There are 5 seconds left.

Your possible match  
payoffs

	Kiwi	Mango	Plum
Blue			
Crimson		Please input an amount to send. Responder's payoff: 15 <input type="text"/> Submit Proposal	
White			

Click on the square to  
make an offer

Move slider to suggest  
the responder's payoff

**You are Crimson.**

Your possible surpluses are 16, 32, or 48  
There are 26 seconds left.

	Kiwi	Mango	Plum
Blue			
Crimson		You made an offer to Mango. If accepted, Mango will keep 15. 7 seconds left to reply.	
White			

Confirmation of offer

**You are Mango.**

Your possible surpluses are 8, 16, or 24  
There are 20 seconds left.

	Blue	Crimson	White
Kiwi			
Mango		<p>Crimson has made you an offer. If you accept, you will keep 15. Please accept or reject.</p> <p><input type="button" value="Accept"/> <input type="button" value="Reject"/></p> <p>1 seconds left for reply.</p>	
Plum			

Decision to accept or reject

Timer

**You are Crimson.**

Your possible surpluses are 8, 16, or 24  
There are 26 seconds left.

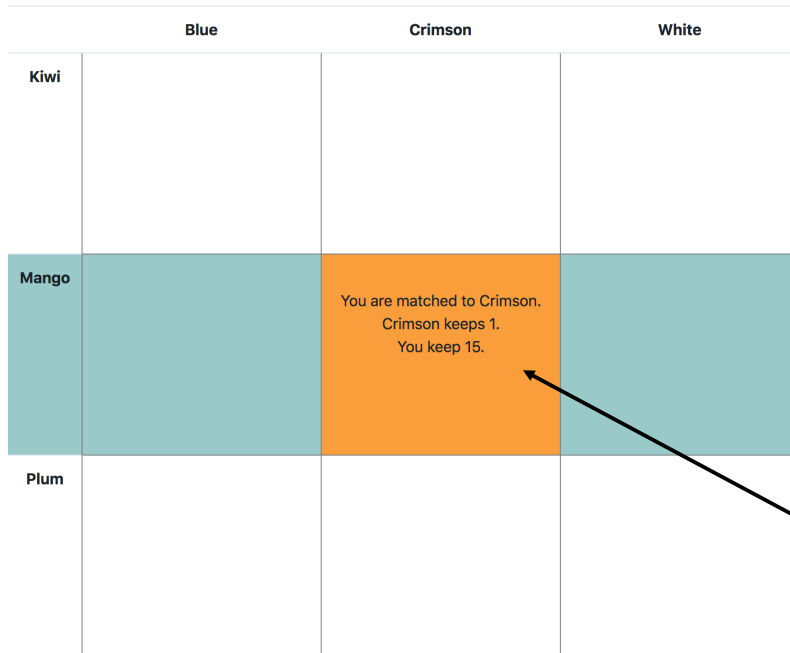
	Kiwi	Mango	Plum
Blue			
Crimson		You are matched to Mango. You keep 1. Mango keeps 15.	
White			

When your offer is accepted, you see the payoffs

**You are Mango.**

Your possible surpluses are 16, 32, or 48  
There are 12 seconds left.

	Blue	Crimson	White
Kiwi			
Mango		You are matched to Crimson. Crimson keeps 1. You keep 15.	
Plum			



When you accept an offer, you see the payoffs

**You are Kiwi.**

Your possible surpluses are 16, 32, or 48  
There are 16 seconds left.

	Blue	Crimson	White
Kiwi			
Mango		Crimson is matched to Mango. Mango keeps 15.	
Plum			

Current match entries are shaded in orange

**Rules of the Experiment, cont...** If you proposed a match which was accepted and in which your own earnings are negative, then you will have an opportunity to unilaterally break this match by clicking a “cancel” button.

**You are White.**

Your possible surpluses are 24, 48, or 72  
There are 16 seconds left.

	Kiwi	Mango	Plum
Blue			
Crimson			
White		You are matched to Mango. You keep -18. Mango keeps 66. <input type="button" value="Cancel"/>	

Negative payoff

Click Cancel button to cancel this match

If you are currently matched, you can still make a match proposal to another individual. If the match proposal is accepted, then your current match will be broken. If you are currently matched, you can still receive match proposals from other individuals. If you accept a match proposal, then your current match will be broken. When you accept a match, or someone else accepts a match with you, any proposal you had made or received before will be automatically rejected.

You are Blue.

Your possible surpluses are 16, 32, or 48  
There are 14 seconds left.

	Kiwi	Mango	Plum
Blue		You are matched to Mango. You keep 19. Mango keeps 13.	Please input an amount to send. <b>Responder's payoff: 14</b> <input type="text"/> Submit Proposal
Crimson			
White			

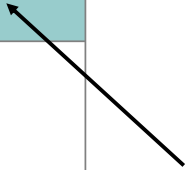
You can make an offer while matched

**You are Blue.**

Your possible surpluses are 16, 32, or 48  
There are 26 seconds left.

	Kiwi	Mango	Plum
Blue		You are matched to Mango. You keep 19. Mango keeps 13.	You made an offer to Plum. If accepted, Plum will keep 14. 6 seconds left to reply.
Crimson			
White			

Confirmation of offer while matched



A round ends after 30 seconds of inactivity (i.e., after 30 seconds in which no new match proposals have been made). Whenever you are ready to proceed, you can also press the “Move on to Next Round” button. When at least 5 in your group press the button, you will automatically move to the next round (without waiting the 30 seconds). If any activity occurs after you press the button, the button will get released.

You are Crimson.

Your possible surpluses are 8, 16, or 24  
There are 16 seconds left.

	Kiwi	Mango	Plum
Blue			
Crimson			You are matched to Plum. Plum keeps -15. You keep 39.
White	White is matched to Kiwi. Kiwi keeps 42.		

Press whenever ready to proceed to next round

Move On to Next Round

**Payoffs for a Round.** Your payoff when the round ends is your final payoff for that round. If you are not matched at the end of the round, your final payoff for that round is 0. Your payoff from temporary matches that are made and then broken during a round do not count for your final payoff.

You are Kiwi.

Your possible surpluses are 16, 32, or 48  
There are 16 seconds left. ←

Timer for the round (round ends after 30 seconds of inactivity)

	Blue	Crimson	White
Kiwi			
Mango		Crimson is matched to Mango. Mango keeps 15.	
Plum			

**Post-Experiment.** At the end of the experiment, you will be paid the sum of your payoffs across rounds (excluding the practice round). You will also be asked to complete several simple tasks at the end. You can earn additional money based on your decisions in these tasks.

**Your Earnings.** Your total earnings in the experiment are the sum of the following amounts:

- \$10 show-up payment
- payoff from 10 main rounds: 10 tokens = 1 dollar
- payoff from the simple tasks:

You need not tell any other participant how much you earned. If there are no questions, we will now begin the actual experiment.