SUPPLEMENT TO "IDENTIFYING HIGHER-ORDER RATIONALITY"

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THIS FILE DETAILS THE EXPERIMENTAL PROTOCOLS used in running the experiment. This includes the instructions, the quiz, and a screenshot of an example game. This file also contains the experimental data which include the actions played by each subject in the 8 games, the treatment, and their classified order of rationality.

APPENDIX A: EXPERIMENTAL PROTOCOLS

Below is the set of instructions for the robustness treatment. The instructions for the main treatment were identical except that there was no mention of the random ordering. Instructions were available to all subjects and displayed on their computer screens, as well as read aloud by the experimenter.

Instructions

You are about to participate in an experiment in the economics of decision-making. If you follow these instructions closely and consider your decisions carefully, you can earn a considerable amount of money, which will be paid to you in cash at the end of the experiment.

To ensure best results for yourself, please DO NOT COMMUNICATE with the other participants at any point during the experiment. If you have any questions, or need assistance of any kind, raise your hand and one of the experimenters will approach you.

The Basic Idea

You will play 8 4-player games. In each of these games, you will be randomly matched with other participants currently in this room. For each game, you will choose one of three actions. Each other participant in your game will also choose one of three actions.

Your Earnings

Your actions \ Player 2's actions	d	e	f
a	10	4	16
b	20	8	0
c	4	18	12

Player 2's Earnings

Player 2's actions \ Player 3's actions	g	h	i
d	12	16	4
e	0	12	8
f	4	4	20

Player 3's Earnings

Player 3's actions \ Player 4's actions	j	k	l
g	20	12	8
h	6	8	18
i	0	16	4

Player 4's Earnings

Player 4's actions \ Your actions	a	b	c
j	10	12	8
k	6	20	18
l	16	4	0

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Your earnings will depend on the combination of your action and player 2's action. These earnings possibilities will be represented in a table like the one above. Your action will determine the row of the table and player 2's action will determine the column of the table. *You may choose action a, b, or c* and player 2 will choose action d, e, or f. The cell corresponding to this combination of actions will determine your earnings.

For example, in the above game, if you choose a and player 2 chooses d, you would earn 10 dollars. If instead player 2 chooses e, you would earn 4 dollars.

Player 2, Player 3, and Player 4's earnings are listed in the other three tables. Player 2 may choose action d, e, or f, Player 3 may choose action g, h, or i, and Player 4 may choose action j, k, or l. Player 2's earnings depend upon the action he chooses and the action player 3 chooses. Player 3's earnings depend upon the action he chooses and the action Player 4 chooses. Player 4's earnings depend upon the action he chooses and the action you choose.

For example, if you choose c, player 2 chooses e, player 3 chooses h, and player 4 chooses k, then you would earn 18 dollars, player 2 would earn 12 dollars, player 3 would earn 8 dollars, and player 4 would earn 18 dollars.

The different earnings tables will appear in a random order for each game. As well, the earnings tables will differ from game to game. So you should always look at the earnings and order of the tables carefully at the beginning of each game.

Player 2's Earnings

Player 2's actions \ Player 3's actions	g	h	i
d	12	16	4
e	0	12	8
f	4	4	20

Player 4's Earnings

Player 4's actions \ Your actions	a	b	c
j	10	12	8
k	6	20	18
l	16	4	0

Your Earnings

Your actions \ Player 2's actions	d	e	f
a	10	4	16
b	20	8	0
c	4	18	12

Player 3's Earnings

Player 3's actions \ Player 4's actions	j	k	l
g	20	12	8
h	6	8	18
i	0	16	4

When you start each new game, you will be randomly matched with different participants. We do our best to ensure that you and your counterparts remain anonymous.

You will be required to spend at least 90 seconds on each game. You may spend more time on each game if you wish.

Earnings

You will earn a show-up payment of $5 for arriving to the experiment on time and participating.

In addition to the show-up payment, one game will be randomly selected for payment at the end of the experiment. Every participant will be paid based on their actions and the actions of their randomly chosen group members in the

selected game. Any of the games could be the one selected. So you should treat each game like it will be the one determining your payment.

You will be informed of your payment, the game chosen for payment, what action you chose in that game, and the action of your randomly matched counterpart only at the end of the experiment. You will not learn any other information about the actions of other players in the experiment. The identity of your randomly chosen counterparts will never be revealed.

Frequently Asked Questions

Q1. Is this some kind of psychology experiment with an agenda you haven't told us?

Answer. No. It is an economics experiment. If we do anything deceptive or don't pay you cash as described, then you can complain to the campus Human Subjects Committee and we will be in serious trouble. These instructions are meant to clarify how you earn money, and our interest is in seeing how people make decisions.

After reading the instructions, subjects answered a short understanding quiz containing 5 questions.

Quiz

Player 3's Earnings

Player 3's actions \ Player 4's actions	j	k	l
g	20	12	8
h	6	8	18
i	0	16	4

Player 2's Earnings

Player 2's actions \ Player 3's actions	g	h	i
d	12	16	4
e	0	12	8
f	4	4	20

Player 4's Earnings

Player 4's actions \ Your actions	a	b	c
j	20	12	8
k	6	8	18
l	0	16	4

Your Earnings

Your actions \ Player 2's actions	d	e	f
a	10	4	16
b	20	8	0
c	4	18	12

Consider the above game. Your earnings are given by the blue numbers. You may choose a or b or c.

1. Your earnings depend on your action and the action of which other player?

(a) ◎ Player 3
(b) ◎ Player 2
(c) ◎ Player 4

2. Suppose you choose a, Player 2 chooses f, Player 3 chooses i, and Player 4 chooses k. What will your earnings be?

(a) ◎ 10
(b) ◎ 0
(c) ◎ 16
(d) ◎ 6

3. Suppose Player 2 chooses d, Player 3 chooses h, and Player 4 chooses j. Which action will give you the highest earning?

(a) ◎ a
(b) ◎ b
(c) ◎ c

4. Suppose you choose c. What is your highest possible earning?

(a) ◎ 20
(b) ◎ 18
(c) ◎ 4

5. Suppose you choose b. What is your lowest possible earning?

(a) ◎ 0
(b) ◎ 4
(c) ◎ 8

Below is an example screenshot from one of the games in the robustness treatment. Games in both treatments were presented in an identical manner, with only the order of the matrices varying between treatments.

Game 1

Player 4's Earnings

Player 4's actions \ Your actions	a	b	c
j	8	12	10
k	6	10	8
l	12	16	14

Your Earnings

Your actions \ Player 2's actions	d	e	f
a	8	20	12
b	0	8	16
c	18	12	6

Player 2's Earnings

Player 2's actions \ Player 3's actions	g	h	i
d	14	18	4
e	20	8	14
f	0	16	18

Player 3's Earnings

Player 3's actions \ Player 4's actions	j	k	l
g	20	14	8
h	16	2	18
i	0	16	16

Your earnings are given by the blue numbers. You may choose action a, b, or c. Your earnings will depend upon the action you choose and the action that Player 2 chooses.

Please choose your action: a ◎
b ◎
c ◎

APPENDIX B: EXPERIMENTAL DATA AND SUBJECT CLASSIFICATION

TABLE II

SUBJECT CHOICES AND CLASSIFICATION[a]

Subject	Order	Exact Match	G1P1	G1P2	G1P3	G1P4	G2P1	G2P2	G2P3	G2P4	Pass Quiz	Treatment
1	0	0	1	3	2	3	1	1	2	3	0	0
2	0	0	1	1	2	1	3	2	2	2	0	1
3	0	0	2	3	2	2	2	3	3	3	1	0
4	0	0	2	1	1	1	1	2	2	2	0	0
5	0	0	3	1	2	2	1	2	2	3	0	0
6	0	0	3	2	2	1	3	1	1	3	1	0
7	0	0	3	2	2	2	3	2	2	3	0	0
8	1	0	1	2	2	1	3	2	2	3	0	0
9	1	0	1	2	1	1	1	2	3	3	1	0
10	1	0	1	2	1	1	1	2	3	3	1	0
11	1	0	1	2	1	1	1	2	3	3	1	0
12	1	0	1	1	1	1	1	2	1	3	0	0
13	1	0	1	2	1	1	1	1	1	3	1	0
14	1	0	1	2	1	1	1	1	1	3	1	1
15	1	0	1	2	1	1	3	2	1	3	0	1
16	1	0	1	2	1	1	3	2	1	3	1	1
17	1	0	3	2	1	1	1	2	1	3	0	0
18	1	0	3	2	1	1	1	2	1	3	1	1
19	1	1	1	2	1	1	1	2	1	3	0	0
20	1	1	1	2	1	1	1	2	1	3	1	0
21	1	1	1	2	1	1	1	2	1	3	1	0
22	1	1	1	2	1	1	1	2	1	3	1	0
23	1	1	1	2	1	1	1	2	1	3	1	0
24	1	1	1	2	1	1	1	2	1	3	1	0
25	1	1	1	2	1	1	1	2	1	3	0	0
26	1	1	1	2	1	1	1	2	1	3	1	1
27	1	1	1	2	1	1	1	2	1	3	0	1
28	1	1	1	2	1	1	1	2	1	3	1	1
29	1	1	1	2	1	1	1	2	1	3	1	1
30	1	1	1	1	2	1	1	1	2	3	1	1
31	1	1	1	2	1	1	1	2	1	3	1	1
32	1	1	1	2	1	1	1	2	1	3	1	1
33	1	1	3	1	1	1	3	1	1	3	1	0
34	1	1	3	2	2	1	3	2	2	3	1	0
35	2	0	1	2	1	1	3	2	2	3	1	0
36	2	0	1	2	1	1	3	2	2	3	1	0
37	2	0	1	2	1	1	3	2	2	3	1	0
38	2	0	1	2	1	1	3	2	2	3	0	0
39	2	0	1	1	1	1	1	2	2	3	1	0
40	2	0	1	2	1	1	3	2	2	3	0	0

(*Continues*)

TABLE II—*Continued*

Subject	Order	Exact Match	G1P1	G1P2	G1P3	G1P4	G2P1	G2P2	G2P3	G2P4	Pass Quiz	Treatment
41	2	0	1	2	1	1	3	2	2	3	1	0
42	2	0	1	2	1	1	3	2	2	3	1	0
43	2	0	1	2	1	1	3	2	2	3	1	0
44	2	0	1	2	1	1	3	2	2	3	1	1
45	2	0	3	2	1	1	3	3	2	3	0	0
46	2	1	1	2	1	1	1	2	2	3	1	0
47	2	1	1	2	1	1	1	2	2	3	1	0
48	2	1	1	2	1	1	1	2	2	3	1	0
49	2	1	1	2	1	1	1	2	2	3	1	0
50	2	1	1	2	1	1	1	2	2	3	1	0
51	2	1	1	2	1	1	1	2	2	3	1	0
52	2	1	1	2	1	1	1	2	2	3	1	0
53	2	1	1	2	1	1	1	2	2	3	1	0
54	2	1	1	2	1	1	1	2	2	3	1	0
55	2	1	1	2	1	1	1	2	2	3	1	0
56	2	1	1	2	1	1	1	2	2	3	0	0
57	2	1	1	2	1	1	1	2	2	3	1	0
58	2	1	1	2	1	1	1	2	2	3	0	1
59	2	1	1	2	1	1	1	2	2	3	0	1
60	2	1	1	2	1	1	1	2	2	3	0	1
61	2	1	1	2	1	1	1	2	2	3	1	1
62	2	1	1	2	1	1	1	2	2	3	1	1
63	2	1	1	2	1	1	1	2	2	3	0	1
64	2	1	1	2	1	1	1	2	2	3	1	1
65	2	1	3	1	1	1	3	1	2	3	1	0
66	3	0	1	2	1	1	2	1	2	3	1	0
67	3	0	3	2	1	1	1	1	2	3	1	0
68	3	0	3	2	1	1	1	1	2	3	1	0
69	3	1	1	2	1	1	1	1	2	3	1	0
70	3	1	1	2	1	1	1	1	2	3	0	0
71	3	1	1	2	1	1	1	1	2	3	1	0
72	3	1	1	2	1	1	1	1	2	3	1	0
73	3	1	1	2	1	1	1	1	2	3	1	0
74	3	1	1	2	1	1	1	1	2	3	1	0
75	3	1	1	2	1	1	1	1	2	3	0	0
76	3	1	1	2	1	1	1	1	2	3	1	0
77	3	1	1	2	1	1	1	1	2	3	1	0
78	3	1	1	2	1	1	1	1	2	3	1	0
79	3	1	1	2	1	1	1	1	2	3	1	0
80	3	1	1	2	1	1	1	1	2	3	1	0
81	3	1	1	2	1	1	1	1	2	3	1	0
82	3	1	1	2	1	1	1	1	2	3	1	0
83	3	1	1	2	1	1	1	1	2	3	1	1
84	3	1	1	2	1	1	1	1	2	3	1	1
85	3	1	1	2	1	1	1	1	2	3	1	1
86	3	1	1	2	1	1	1	1	2	3	1	1

(*Continues*)

TABLE II—*Continued*

Subject	Order	Exact Match	G1P1	G1P2	G1P3	G1P4	G2P1	G2P2	G2P3	G2P4	Pass Quiz	Treatment
87	3	1	1	2	1	1	1	1	2	3	0	1
88	3	1	3	2	1	1	3	1	2	3	1	0
89	3	1	3	2	1	1	3	1	2	3	0	0
90	3	1	3	2	1	1	3	1	2	3	0	1
91	4	0	1	2	1	1	3	3	2	3	1	0
92	4	0	1	2	1	1	3	3	2	3	1	0
93	4	0	1	2	1	1	3	1	1	3	1	0
94	4	0	1	2	1	1	3	1	3	3	1	1
95	4	0	1	2	1	1	3	1	3	3	1	1
96	4	1	1	2	1	1	3	1	2	3	1	0
97	4	1	1	2	1	1	3	1	2	3	1	0
98	4	1	1	2	1	1	3	1	2	3	1	0
99	4	1	1	2	1	1	3	1	2	3	1	0
100	4	1	1	2	1	1	3	1	2	3	1	0
101	4	1	1	2	1	1	3	1	2	3	1	0
102	4	1	1	2	1	1	3	1	2	3	1	0
103	4	1	1	2	1	1	3	1	2	3	1	0
104	4	1	1	2	1	1	3	1	2	3	1	0
105	4	1	1	2	1	1	3	1	2	3	1	0
106	4	1	1	2	1	1	3	1	2	3	1	0
107	4	1	1	2	1	1	3	1	2	3	1	0
108	4	1	1	2	1	1	3	1	2	3	1	0
109	4	1	1	2	1	1	3	1	2	3	1	1
110	4	1	1	2	1	1	3	1	2	3	0	1
111	4	1	1	2	1	1	3	1	2	3	1	1
112	4	1	1	2	1	1	3	1	2	3	1	1
113	4	1	1	2	1	1	3	1	2	3	1	1
114	4	1	1	2	1	1	3	1	2	3	1	1
115	4	1	1	2	1	1	3	1	2	3	1	1
116	4	1	1	2	1	1	3	1	2	3	0	1

[a]Action 1 = a, 2 = b, and 3 = c. Order 0 = R0, 1 = R1, 2 = R2, 3 = R3, 4 = R4. Treatment 0 = main treatment, 1 = robustness treatment. Exact match = 1 refers to the subject being assigned type Rk based on exact match, = 0 refers to the subject being matched based on error.

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