A Structural Analysis of Disappointment Aversion in a Real Effort Competition

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Web Appendix

C   Experimental Instructions

Please open the brown envelope you have just collected. I am reading from the four page instructions sheet which you will find in your brown envelope. [**Open brown envelope**]

Thank you for participating in this session. There will be a number of pauses for you to ask questions. During such a pause, please raise your hand if you want to ask a question. Apart from asking questions in this way, you must not communicate with anybody in this room. Please now turn off mobile phones and any other electronic devices. These must remain turned off for the duration of this session. Are there any questions?

You have been allocated to a computer booth according to the number on the card you selected as you came in. You must not look into any of the other computer booths at any time during this session. As you came in you also selected a white sealed envelope. Please now open your white envelope. [**Open white envelope**]

Each white envelope contains a different four digit Participant ID number. To ensure anonymity, your actions in this session are linked to this Participant ID number and at the end of this session you will be paid by Participant ID number. You will be paid a show up fee of £4 together with any money you accumulate during this session. The amount of money you accumulate will depend partly on your actions, partly on the actions of others and partly on chance. All payments will be made in cash in another room. Neither I nor any of the other participants will see how much you have been paid. Please follow the instructions that will appear shortly on your computer screen to enter your four digit Participant ID number. [**Enter four digit Participant ID number**] Please now return your Participant ID number to its envelope, and keep this safe as your Participant ID number will be required for payment at the end.

This session consists of 2 practice rounds, for which you will not be paid, followed by 10 paying rounds with money prizes. In each round you will undertake an identical task lasting 120 seconds. The task will consist of a screen with 48 sliders. Each slider is initially positioned at 0 and can be moved as far as 100. Each slider has a number to its right showing its current position. You can use the mouse in any way you like to move each slider. You can readjust the position of each slider as many times as you wish. Your "points score" in the task will be the number of sliders positioned at exactly 50 at the end of the 120 seconds. Are there any questions?

Before the first practice round, you will discover whether you are a "First Mover" or a "Second Mover". You will remain either a First Mover or a Second Mover for the entirety of this session.

In each round, you will be paired. One pair member will be a First Mover and the other will be a Second Mover. The First Mover will undertake the task first, and then the Second Mover will undertake the task. The Second Mover will see the First Mover's points score before starting the task.

In each paying round, there will be a prize which one pair member will win. Each pair's prize will be chosen randomly at the beginning of the round and will be between £0.10 and £3.90. The winner of the prize will depend on the difference between the First Mover's and the Second Mover's points scores and some element of chance. If the points scores are the same,

each pair member will have a 50% chance of winning the prize. If the points scores are not the same, the chance of winning for the pair member with the higher points score increases by 1 percentage point for every increase of 1 in the difference between the points scores, while the chance of winning for the pair member with the lower points score correspondingly decreases by 1 percentage point. The table at the end of these instructions gives the chance of winning for any points score difference. Please look at this table now. [**Look at table**] Are there any questions?

During each task, a number of pieces of information will appear at the top of your screen, including the time remaining, the round number, whether you are a First Mover or a Second Mover, the prize for the round and your points score in the task so far. If you are a Second Mover, you will also see the points score of the First Mover you are paired with.

After both pair members have completed the task, each pair member will see a summary screen showing their own points score, the other pair member's points score, their probability of winning, the prize for the round and whether they were the winner or the loser of the round.

We will now start the first of the two practice rounds. In the practice rounds, you will be paired with an automaton who behaves randomly. Before we start, are there any questions? Please look at your screen now. [**First practice round**] Before we start the second practice round, are there any questions? Please look at your screen now. [**Second practice round**] Are there any questions?

The practice rounds are finished. We will now move on to the 10 paying rounds. In every paying round, each First Mover will be paired with a Second Mover. The pairings will be changed after every round and pairings will not depend on your previous actions. You will not be paired with the same person twice. Furthermore, the pairings are done in such a way that the actions you take in one round cannot affect the actions of the people you will be paired with in later rounds. This also means that the actions of the person you are paired with in a given round cannot be affected by your actions in earlier rounds. (If you are interested, this is because you will not be paired with a person who was paired with someone who had been paired with you, and you will not be paired with a person who was paired with someone who had been paired with someone who had been paired with you, and so on.) Are there any questions?

We will now start the 10 paying rounds. There will be no pauses between the rounds. Before we start the paying rounds, are there any remaining questions? There will be no further opportunities to ask questions. Please look at your screen now. [**10 paying rounds**]

The session is now complete. Your total cash payment, including the show up fee, is displayed on your screen. Please leave the room one by one when asked to do so to receive your payment. Remember to bring the envelope containing your four digit Participant ID number with you but please leave all other materials on your desk. Thank you for participating.

Difference in points scores	Chance of winning prize for Mover with higher score	Chance of winning prize for Mover with lower score
0	50%	50%
1	51%	49%
2	52%	48%
3	53%	47%
4	54%	46%
5	55%	45%
6	56%	44%
7	57%	43%
8	58%	42%
9	59%	41%
10	60%	40%
11	61%	39%
12	62%	38%
13	63%	37%
14	64%	36%
15	65%	35%
16	66%	34%
17	67%	33%
18	68%	32%
19	69%	31%
20	70%	30%
21	71%	29%
22	72%	28%
23	73%	27%
24	74%	26%
25	75%	25%
26	76%	24%
27	77%	23%
28	78%	22%
29	79%	21%
30	80%	20%
31	81%	19%
32	82%	18%
33	83%	17%
34	84%	16%
35	85%	15%
36	86%	14%
37	87%	13%
38	88%	12%
39	89%	11%
40	90%	10%
41	91%	9%
42	92%	8%
43	93%	7%
44	94%	6%
45	95%	5%
46	96%	4%
47	97%	3%
48	98%	2%
49	Not possible as there are only 48 sliders	
50	Not possible as there are only 48 sliders	

Table 6: Chance of winning in a given round.

D   Comprehension Quiz

[The subsection on "Confusion" in Section 5 describes the subject pool and reports summary statistics on the results of the quiz.]

Please look at the first page of the instructions on your desk. I am reading from these instructions. Please now turn off cell phones and any other electronic devices. These must remain turned off for the duration of this session. Please do not use or place on your desk any personal items, including calculators, phones etc. Please do not look into anyone else's booth at any time. Thank you for participating in this experimental session on economic decision-making. You were randomly selected from the Economic Science Laboratory's pool of subjects to be invited to participate in this session. There will be a number of pauses for you to ask questions. During such a pause, please raise your hand if you want to ask a question. Apart from asking questions, you must not communicate with anybody in this room or make any noise. You will be paid a show-up fee of $5 together with any money you accumulate during this session. You will be paid privately in cash at the end of the session. Are there any questions? Please turn to page 2 now.

This session consists of a test of understanding. The situation described below formed part of a previous experiment, and we want to see whether the subjects in that experiment understood the situation. Please consider the situation described below carefully, and then answer the 10 questions about the situation on pages 5 and 6. You will earn $2 for every right answer and you will not be penalized for wrong answers. I will read the situation aloud and then you will have 20 minutes to answer the 10 questions. Note that you will not be participating directly in the situation described: all you have to do is answer the 10 questions about it. Are there any questions?

THE SITUATION:

Two people are randomly paired and then compete to win a prize of $3. The two people separately complete a task in which they can score from 0 to 48 points. Each person's score in the task is called their "points score". One person, called the "First Mover", completes the task first. The other person, called the "Second Mover", then completes the task.

The winner of the prize will depend on the difference between the First Mover's and the Second Mover's points scores and some element of chance. If the points scores are the same, each pair member will have a 50% chance of winning the prize. If the points scores are not the same, the chance of winning for the pair member with the higher points score increases by 1 percentage point for every increase of 1 in the difference between the points scores, while the chance of winning for the pair member with the lower points score correspondingly decreases by 1 percentage point. The table on page 3 gives the chance of winning for any points score difference. Please turn to page 3 now and look at this table, and then wait for further instructions.

[The text in the paragraph above is from the original experimental instructions in Appendix C. The table presented to the subjects in the quiz was the same as Table 6 which was presented to the original experimental subjects, except that "there are only 48 sliders" was replaced with "the maximum points score is 48".]

Please turn to page 4 now. Are there any questions? You will have 20 minutes to answer the 10 questions on pages 5 and 6. If you finish before 20 minutes, please wait in your booth. I will give you verbal warnings when there are 15 minutes left, when there are 10 minutes left, when there are 5 minutes left, and when there is 1 minute left. If you have a question during the 20 minutes, please raise your hand. You are allowed to refer back to the description of the situation on page 2 and the table on page 3 to help you answer the questions. You will earn $2 for every right answer and you will not be penalized for wrong answers. Are there any questions? Please turn to page 5 now. Your 20 minutes start now.

[*We ran two treatments, each with 30 subjects, which differed only in the Second Mover points score numbers. Below, the numbers in the first brackets are from the first treatment and the numbers in the second brackets are from the second treatment.*]

QUESTIONS 1 TO 5 (Please turn to the next page for questions 6 to 10)
You have 20 minutes to answer all 10 questions. You are allowed to refer back to the description of the situation on page 2 and the table on page 3 to help you answer the questions. You will earn $2 for every right answer and you will not be penalized for wrong answers.

For questions 1 to 5, suppose that the First Mover's points score is 20.
Q1: If the Second Mover's points score is [33][16], what is the difference between the points scores of the two people? [Correct answer: [13][4]]
Q2: If the Second Mover's points score is [33][16], what is the Second Mover's probability of winning the prize (that is, how many times out of 100 would the Second Mover win the prize on average)? [Correct answer: [63%][46%]]
Q3: If the Second Mover's points score is [34][17], what is the difference between the points scores of the two people? [Correct answer: [14][3]]
Q4: If the Second Mover's points score is [34][17], what is the Second Mover's probability of winning the prize (that is, how many times out of 100 would the Second Mover win the prize on average)? [Correct answer: [64%][47%]]
Q5: If the Second Mover's points score goes up from [33][16] to [34][17], what is the **increase** in the Second Mover's probability of winning the prize (that is, how many **more** times out of 100 would the Second Mover win the prize on average)? [Correct answer: [1][1]]

QUESTIONS 6 TO 10
You have 20 minutes to answer all 10 questions. You are allowed to refer back to the description of the situation on page 2 and the table on page 3 to help you answer the questions. You will earn $2 for every right answer and you will not be penalized for wrong answers.

For questions 6 to 10, suppose that the First Mover's points score is 30.
Q6: If the Second Mover's points score is [33][16], what is the difference between the points scores of the two people? [Correct answer: [3][14]]
Q7: If the Second Mover's points score is [33][16], what is the Second Mover's probability of winning the prize (that is, how many times out of 100 would the Second Mover win the prize on average)? [Correct answer: [53%][36%]]

Q8: If the Second Mover's points score is [34][17], what is the difference between the points scores of the two people? [Correct answer: [4][13]]

Q9: If the Second Mover's points score is [34][17], what is the Second Mover's probability of winning the prize (that is, how many times out of 100 would the Second Mover win the prize on average)? [Correct answer: [54%][37%]]

Q10: If the Second Mover's points score goes up from [33][16] to [34][17], what is the **increase** in the Second Mover's probability of winning the prize (that is, how many **more** times out of 100 would the Second Mover win the prize on average)? [Correct answer: [1][1]]