Online Appendix for:

Experimental Evidence on Misguided Learning

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A The Use of Tables by Biased Agents

In the following section we show how a myopic agent who only updates his beliefs about the state of the world uses the tables in the multiple- and single-feedback rounds.

In the first example, we assume that the agent's relative performance parameter is $A = 47.5\%$ and he is guessing the number $\Phi = -1$ in a multiple-feedback round. The agent is *overconfident* and believes that his performance lies in the $55 - 60\%$ interval. Figure 3 illustrates this case: we depicted the agent's actual performance and the number in red, and the agent's beliefs and actions in blue. The agent enters $e_1 = 0$ as his first guess. Afterwards, the computer displays the feedback of 29.71, which consists of the payoff $\Pi_1 = 29.68$ and the added random component $\epsilon_1 = 0.03$. The agent believes that his relative performance lies in the $55 - 60\%$ interval, therefore he looks at the row outlined in blue, and searches for a value that is the closest to his feedback. There is only one such value (29.60), and the agent concludes that the number he is guessing is equal to $\phi_2 = -3$. The agent updates his beliefs about the number and enters $e_2 = -3$ as his second guess. The computer displays a new feedback: 29.45. The agent browses the tables looking for the one with the number -3 in the title (see Figure 4). Once again he looks at the row with the relative performance between 55% and 60% and compares his feedback to the values in that row. The overconfident agent concludes that the number must be equal to $\phi_3 = -4$ and he chooses $e_3 = -4$ as his third guess. In the following step, he becomes even more mistaken, concluding that the number is $\phi_4 = -5$ and choosing $e_4 = -5$ as his last guess (presented in Figure 5). The overconfident agent's beliefs change in the following way: $\phi_1 = 0$, $\phi_2 = -3$, $\phi_3 = -4$, $\phi_4 = -5$. As predicted by the model, the learning process is self-defeating: the additional feedback drives the agent's beliefs further away from the true state.

In a single-feedback round, the agent's reasoning after the first guess is the same as in the multiple-feedback round. He forms a belief $\phi_2 = -3$ and enters the optimal action $e_2 = -3$. In contrast to the multiple-feedback round, any feedback the agent receives afterward is based on his first guess, hence he should use the table with 0 in the title. The agent receives the feedback 29.59 (the noise component is $\epsilon_2 = -0.09$). The closest value in the table is again 29.68, so he should enter $e_3 = -3$. The last feedback differs only with respect to the noise term, inducing a belief $\phi_4 = -3$ and prompting the action

$e_4 = -3$. In the single-feedback rounds, the agent's beliefs change as follows: $\phi_1 = 0$, $\phi_2 = -3$, $\phi_3 = -3$, $\phi_4 = -3$. Severing the link between the actions and output precludes self-defeating learning.

The next example considers an *underconfident* agent with the relative performance $A = 62.5\%$ who is guessing the number $\Phi = 4$ in a multiple-feedback round. The agent believes that his relative performance is 10% lower and lies in the $50 - 55\%$ interval. When he sees the feedback of 35.85 (the actual payoff 35.96 with the added noise term $\epsilon_1 = -0.11$), he infers that the number is equal to $\phi_2 = 9$. We depict the first step in Figure 6. The agent's actual performance parameter and the number are in red, and his beliefs and choices are in blue. The underconfident agent enters $e_2 = 9$ as his second guess and obtains the feedback 35.57 that includes the noise term $\epsilon_2 = -0.01$. He goes to the table with the number 9 in the title (presented in Figure 7). The value closest to his feedback, i.e. $\Pi = 35.66$, points to the number $\phi_3 = 6$. The agent updates his beliefs, enters the optimal action $e_3 = 6$ and receives the feedback of 36.78 ($\epsilon_3 = 0.05$). In the last step, he turns to table 6 (presented in Figure 8), from which he infers that $\phi_4 = 6$ is the number he is looking for, thus he enters $e_4 = 6$. The underconfident agent's beliefs follow the path: $\phi_1 = 0$, $\phi_2 = 9$, $\phi_3 = 6$, $\phi_4 = 6$. As predicted by the model, the underconfident agent first overshoots and then corrects his actions. In a single-feedback round, the agent would not update his beliefs after the second guess, thus entering $e_3 = e_4 = 9$ as his third and fourth guess.

The last example illustrates the behavior of an *unbiased* agent, who has the relative performance of $A = 72.5\%$ and is guessing the number $\Phi = -4$ in a multiple-feedback round. After entering $e_1 = 0$ the agent receives the feedback of 31.82 (the actual payoff is 31.85 and the added noise term $\epsilon_1 = -0.03$), which points to the correct number $\phi_2 = -4$. The agent enters $e_2 = -4$ and turns to the table with -4 in the title (presented in Figure 10). The feedback displayed on his screen is the payoff of 33.39 with a perturbation, which points to the number $\phi_3 = -4$. Regardless of the noise realization, the feedback will not be closer to any other value but 33.39. The agent chooses the optimal action $e_4 = -4$ as his fourth guess. The learning process of the unbiased individual is immediate and his belief is stable afterward.

Ihre Schätzung war: 0

Leistungsintervall	Mögliche Zufallzahl: −10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	30.47	31.65	32.84	34.02	35.20	36.39	37.57	38.76	39.94	41.12	42.31	42.72	43.14	43.56	43.97	44.39	44.80	45.22	45.64	46.05	46.47
90 – 95%	29.32	30.51	31.69	32.88	34.06	35.24	36.43	37.61	38.80	39.98	41.16	41.58	42.00	42.41	42.83	43.24	43.66	44.08	44.49	44.91	45.32
85 – 90%	28.18	29.36	30.55	31.73	32.92	34.10	35.28	36.47	37.65	38.84	40.02	40.44	40.85	41.27	41.68	42.10	42.52	42.93	43.35	43.76	44.18
80 – 85%	27.04	28.22	29.40	30.59	31.77	32.96	34.14	35.32	36.51	37.69	38.88	39.29	39.71	40.12	40.54	40.96	41.37	41.79	42.20	42.62	43.04
75 – 80%	25.89	27.08	28.26	29.44	30.63	31.81	33.00	34.18	35.36	36.55	37.73	38.15	38.56	38.98	39.40	39.81	40.23	40.64	41.06	41.48	41.89
70 – 75%	24.75	25.93	27.12	28.30	29.48	30.67	31.85	33.04	34.22	35.40	36.59	37.00	37.42	37.84	38.25	38.67	39.08	39.50	39.92	40.33	40.75
65 – 70%	23.60	24.79	25.97	27.16	28.34	29.52	30.71	31.89	33.08	34.26	35.44	35.86	36.28	36.69	37.11	37.52	37.94	38.36	38.77	39.19	39.60
60 – 65%	22.46	23.64	24.83	26.01	27.20	28.38	29.56	30.75	31.93	33.12	34.30	34.72	35.13	35.55	35.96	36.38	36.80	37.21	37.63	38.04	38.46
55 – 60%	21.32	22.50	23.68	24.87	26.05	27.24	28.42	29.60	30.79	31.97	33.16	33.57	33.99	34.40	34.82	35.24	35.65	36.07	36.48	36.90	37.32
50 – 55%	20.17	21.36	22.54	23.72	24.91	26.09	27.28	28.46	29.64	30.83	32.01	32.43	32.84	33.26	33.68	34.09	34.51	34.92	35.34	35.76	36.17
45 – 50%	19.03	20.21	21.40	22.58	23.76	24.95	26.13	27.32	28.50	29.68	30.87	31.28	31.70	32.12	32.53	32.95	33.36	33.78	34.20	34.61	35.03
40 – 45%	17.88	19.07	20.25	21.44	22.62	23.80	24.99	26.17	27.36	28.54	29.72	30.14	30.56	30.97	31.39	31.80	32.22	32.64	33.05	33.47	33.88
35 – 40%	16.74	17.92	19.11	20.29	21.48	22.66	23.84	25.03	26.21	27.40	28.58	29.00	29.41	29.83	30.24	30.66	31.08	31.49	31.91	32.32	32.74
30 – 35%	15.60	16.78	17.96	19.15	20.33	21.52	22.70	23.88	25.07	26.25	27.44	27.85	28.27	28.68	29.10	29.52	29.93	30.35	30.76	31.18	31.60
25 – 30%	14.45	15.64	16.82	18.00	19.19	20.37	21.56	22.74	23.92	25.11	26.29	26.71	27.12	27.54	27.96	28.37	28.79	29.20	29.62	30.04	30.45
20 – 25%	13.31	14.49	15.68	16.86	18.04	19.23	20.41	21.60	22.78	23.96	25.15	25.56	25.98	26.40	26.81	27.23	27.64	28.06	28.48	28.89	29.31
15 – 20%	12.16	13.35	14.53	15.72	16.90	18.08	19.27	20.45	21.64	22.82	24.00	24.42	24.84	25.25	25.67	26.08	26.50	26.92	27.33	27.75	28.16
10 – 15%	11.02	12.20	13.39	14.57	15.76	16.94	18.12	19.31	20.49	21.68	22.86	23.28	23.69	24.11	24.52	24.94	25.36	25.77	26.19	26.60	27.02
5 – 10%	9.88	11.06	12.24	13.43	14.61	15.80	16.98	18.16	19.35	20.53	21.72	22.13	22.55	22.96	23.38	23.80	24.21	24.63	25.04	25.46	25.88
0 – 5%	8.73	9.92	11.10	12.28	13.47	14.65	15.84	17.02	18.20	19.39	20.57	20.99	21.40	21.82	22.24	22.65	23.07	23.48	23.90	24.32	24.73

Figure 1: The use of tables by the overconfident agent: the 2nd guess.

Ihre Schätzung war: −3

Leistungsintervall	Mögliche Zufallzahl: −10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	31.62	32.80	33.99	35.17	36.36	37.54	38.72	39.91	40.32	40.74	41.16	41.57	41.99	42.40	42.82	43.24	43.65	44.07	44.48	44.90	45.32
90 – 95%	30.48	31.66	32.84	34.03	35.21	36.40	37.58	38.76	39.18	39.60	40.01	40.43	40.84	41.26	41.68	42.09	42.51	42.92	43.34	43.76	44.17
85 – 90%	29.33	30.52	31.70	32.88	34.07	35.25	36.44	37.62	38.04	38.45	38.87	39.28	39.70	40.12	40.53	40.95	41.36	41.78	42.20	42.61	43.03
80 – 85%	28.19	29.37	30.56	31.74	32.92	34.11	35.29	36.48	36.89	37.31	37.72	38.14	38.56	38.97	39.39	39.80	40.22	40.64	41.05	41.47	41.88
75 – 80%	27.04	28.23	29.41	30.60	31.78	32.96	34.15	35.33	35.75	36.16	36.58	37.00	37.41	37.83	38.24	38.66	39.08	39.49	39.91	40.32	40.74
70 – 75%	25.90	27.08	28.27	29.45	30.64	31.82	33.00	34.19	34.60	35.02	35.44	35.85	36.27	36.68	37.10	37.52	37.93	38.35	38.76	39.18	39.60
65 – 70%	24.76	25.94	27.12	28.31	29.49	30.68	31.86	33.04	33.46	33.88	34.29	34.71	35.12	35.54	35.96	36.37	36.79	37.20	37.62	38.04	38.45
60 – 65%	23.61	24.80	25.98	27.16	28.35	29.53	30.72	31.90	32.32	32.73	33.15	33.56	33.98	34.40	34.81	35.23	35.64	36.06	36.48	36.89	37.31
55 – 60%	22.47	23.65	24.84	26.02	27.20	28.39	29.57	30.76	31.17	31.59	32.00	32.42	32.84	33.25	33.67	34.08	34.50	34.92	35.33	35.75	36.16
50 – 55%	21.32	22.51	23.69	24.88	26.06	27.24	28.43	29.61	30.03	30.44	30.86	31.28	31.69	32.11	32.52	32.94	33.36	33.77	34.19	34.60	35.02
45 – 50%	20.18	21.36	22.55	23.73	24.92	26.10	27.28	28.47	28.88	29.30	29.72	30.13	30.55	30.96	31.38	31.80	32.21	32.63	33.04	33.46	33.88
40 – 45%	19.04	20.22	21.40	22.59	23.77	24.96	26.14	27.32	27.74	28.16	28.57	28.99	29.40	29.82	30.24	30.65	31.07	31.48	31.90	32.32	32.73
35 – 40%	17.89	19.08	20.26	21.44	22.63	23.81	25.00	26.18	26.60	27.01	27.43	27.84	28.26	28.68	29.09	29.51	29.92	30.34	30.76	31.17	31.59
30 – 35%	16.75	17.93	19.12	20.30	21.48	22.67	23.85	25.04	25.45	25.87	26.28	26.70	27.12	27.53	27.95	28.36	28.78	29.20	29.61	30.03	30.44
25 – 30%	15.60	16.79	17.97	19.16	20.34	21.52	22.71	23.89	24.31	24.72	25.14	25.56	25.97	26.39	26.80	27.22	27.64	28.05	28.47	28.88	29.30
20 – 25%	14.46	15.64	16.83	18.01	19.20	20.38	21.56	22.75	23.16	23.58	24.00	24.41	24.83	25.24	25.66	26.08	26.49	26.91	27.32	27.74	28.16
15 – 20%	13.32	14.50	15.68	16.87	18.05	19.24	20.42	21.60	22.02	22.44	22.85	23.27	23.68	24.10	24.52	24.93	25.35	25.76	26.18	26.60	27.01
10 – 15%	12.17	13.36	14.54	15.72	16.91	18.09	19.28	20.46	20.88	21.29	21.71	22.12	22.54	22.96	23.37	23.79	24.20	24.62	25.04	25.45	25.87
5 – 10%	11.03	12.21	13.40	14.58	15.76	16.95	18.13	19.32	19.73	20.15	20.56	20.98	21.40	21.81	22.23	22.64	23.06	23.48	23.89	24.31	24.72
0 – 5%	9.88	11.07	12.25	13.44	14.62	15.80	16.99	18.17	18.59	19.00	19.42	19.84	20.25	20.67	21.08	21.50	21.92	22.33	22.75	23.16	23.58

Figure 2: The use of tables by the overconfident agent: the 3rd guess.

Ihre Schätzung war: −4

Mögliche Zufallzahl:

Leistungsintervall	−10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 − 100%	32.00	33.19	34.37	35.56	36.74	37.92	39.11	39.52	39.94	40.36	40.77	41.19	41.60	42.02	42.44	42.85	43.27	43.68	44.10	44.52	44.93
90 − 95%	30.86	32.04	33.23	34.41	35.60	36.78	37.96	38.38	38.80	39.21	39.63	40.04	40.46	40.88	41.29	41.71	42.12	42.54	42.96	43.37	43.79
85 − 90%	29.72	30.90	32.08	33.27	34.45	35.64	36.82	37.24	37.65	38.07	38.48	38.90	39.32	39.73	40.15	40.56	40.98	41.40	41.81	42.23	42.64
80 − 85%	28.57	29.76	30.94	32.12	33.31	34.49	35.68	36.09	36.51	36.92	37.34	37.76	38.17	38.59	39.00	39.42	39.84	40.25	40.67	41.08	41.50
75 − 80%	27.43	28.61	29.80	30.98	32.16	33.35	34.53	34.95	35.36	35.78	36.20	36.61	37.03	37.44	37.86	38.28	38.69	39.11	39.52	39.94	40.36
70 − 75%	26.28	27.47	28.65	29.84	31.02	32.20	33.39	33.80	34.22	34.64	35.05	35.47	35.88	36.30	36.72	37.13	37.55	37.96	38.38	38.80	39.21
65 − 70%	25.14	26.32	27.51	28.69	29.88	31.06	32.24	32.66	33.08	33.49	33.91	34.32	34.74	35.16	35.57	35.99	36.40	36.82	37.24	37.65	38.07
60 − 65%	24.00	25.18	26.36	27.55	28.73	29.92	31.10	31.52	31.93	32.35	32.76	33.18	33.60	34.01	34.43	34.84	35.26	35.68	36.09	36.51	36.92
55 − 60%	22.85	24.04	25.22	26.40	27.59	28.77	29.96	30.37	30.79	31.20	31.62	32.04	32.45	32.87	33.28	33.70	34.12	34.53	34.95	35.36	35.78
50 − 55%	21.71	22.89	24.08	25.26	26.44	27.63	28.81	29.23	29.64	30.06	30.48	30.89	31.31	31.72	32.14	32.56	32.97	33.39	33.80	34.22	34.64
45 − 50%	20.56	21.75	22.93	24.12	25.30	26.48	27.67	28.08	28.50	28.92	29.33	29.75	30.16	30.58	31.00	31.41	31.83	32.24	32.66	33.08	33.49
40 − 45%	19.42	20.60	21.79	22.97	24.16	25.34	26.52	26.94	27.36	27.77	28.19	28.60	29.02	29.44	29.85	30.27	30.68	31.10	31.52	31.93	32.35
35 − 40%	18.28	19.46	20.64	21.83	23.01	24.20	25.38	25.80	26.21	26.63	27.04	27.46	27.88	28.29	28.71	29.12	29.54	29.96	30.37	30.79	31.20
30 − 35%	17.13	18.32	19.50	20.68	21.87	23.05	24.24	24.65	25.07	25.48	25.90	26.32	26.73	27.15	27.56	27.98	28.40	28.81	29.23	29.64	30.06
25 − 30%	15.99	17.17	18.36	19.54	20.72	21.91	23.09	23.51	23.92	24.34	24.76	25.17	25.59	26.00	26.42	26.84	27.25	27.67	28.08	28.50	28.92
20 − 25%	14.84	16.03	17.21	18.40	19.58	20.76	21.95	22.36	22.78	23.20	23.61	24.03	24.44	24.86	25.28	25.69	26.11	26.52	26.94	27.36	27.77
15 − 20%	13.70	14.88	16.07	17.25	18.44	19.62	20.80	21.22	21.64	22.05	22.47	22.88	23.30	23.72	24.13	24.55	24.96	25.38	25.80	26.21	26.63
10 − 15%	12.56	13.74	14.92	16.11	17.29	18.48	19.66	20.08	20.49	20.91	21.32	21.74	22.16	22.57	22.99	23.40	23.82	24.24	24.65	25.07	25.48
5 − 10%	11.41	12.60	13.78	14.96	16.15	17.33	18.52	18.93	19.35	19.76	20.18	20.60	21.01	21.43	21.84	22.26	22.68	23.09	23.51	23.92	24.34
0 − 5%	10.27	11.45	12.64	13.82	15.00	16.19	17.37	17.79	18.20	18.62	19.04	19.45	19.87	20.28	20.70	21.12	21.53	21.95	22.36	22.78	23.20

Figure 3: The use of tables by the overconfident agent: the 4th guess.

Ihre Schätzung war: 0

Mögliche Zufallzahl:

Leistungsintervall	−10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 − 100%	30.47	31.65	32.84	34.02	35.20	36.39	37.57	38.76	39.94	41.12	42.31	42.72	43.14	43.56	43.97	44.39	44.80	45.22	45.64	46.05	46.47
90 − 95%	29.32	30.51	31.69	32.88	34.06	35.24	36.43	37.61	38.80	39.98	41.16	41.58	42.00	42.41	42.83	43.24	43.66	44.08	44.49	44.91	45.32
85 − 90%	28.18	29.36	30.55	31.73	32.92	34.10	35.28	36.47	37.65	38.84	40.02	40.44	40.85	41.27	41.68	42.10	42.52	42.93	43.35	43.76	44.18
80 − 85%	27.04	28.22	29.40	30.59	31.77	32.96	34.14	35.32	36.51	37.69	38.88	39.29	39.71	40.12	40.54	40.96	41.37	41.79	42.20	42.62	43.04
75 − 80%	25.89	27.08	28.26	29.44	30.63	31.81	33.00	34.18	35.36	36.55	37.73	38.15	38.56	38.98	39.40	39.81	40.23	40.64	41.06	41.48	41.89
70 − 75%	24.75	25.93	27.12	28.30	29.48	30.67	31.85	33.04	34.22	35.40	36.59	37.00	37.42	37.84	38.25	38.67	39.08	39.50	39.92	40.33	40.75
65 − 70%	23.60	24.79	25.97	27.16	28.34	29.52	30.71	31.89	33.08	34.26	35.44	35.86	36.28	36.69	37.11	37.52	37.94	38.36	38.77	39.19	39.60
60 − 65%	22.46	23.64	24.83	26.01	27.20	28.38	29.56	30.75	31.93	33.12	34.30	34.72	35.13	35.55	35.96	36.38	36.80	37.21	37.63	38.04	38.46
55 − 60%	21.32	22.50	23.68	24.87	26.05	27.24	28.42	29.60	30.79	31.97	33.16	33.57	33.99	34.40	34.82	35.24	35.65	36.07	36.48	36.90	37.32
50 − 55%	20.17	21.36	22.54	23.72	24.91	26.09	27.28	28.46	29.64	30.83	32.01	32.43	32.84	33.26	33.68	34.09	34.51	34.92	35.34	35.76	36.17
45 − 50%	19.03	20.21	21.40	22.58	23.76	24.95	26.13	27.32	28.50	29.68	30.87	31.28	31.70	32.12	32.53	32.95	33.36	33.78	34.20	34.61	35.03
40 − 45%	17.88	19.07	20.25	21.44	22.62	23.80	24.99	26.17	27.36	28.54	29.72	30.14	30.56	30.97	31.39	31.80	32.22	32.64	33.05	33.47	33.88
35 − 40%	16.74	17.92	19.11	20.29	21.48	22.66	23.84	25.03	26.21	27.40	28.58	29.00	29.41	29.83	30.24	30.66	31.08	31.49	31.91	32.32	32.74
30 − 35%	15.60	16.78	17.96	19.15	20.33	21.52	22.70	23.88	25.07	26.25	27.44	27.85	28.27	28.68	29.10	29.52	29.93	30.35	30.76	31.18	31.60
25 − 30%	14.45	15.64	16.82	18.00	19.19	20.37	21.56	22.74	23.92	25.11	26.29	26.71	27.12	27.54	27.96	28.37	28.79	29.20	29.62	30.04	30.45
20 − 25%	13.31	14.49	15.68	16.86	18.04	19.23	20.41	21.60	22.78	23.96	25.15	25.56	25.98	26.40	26.81	27.23	27.64	28.06	28.48	28.89	29.31
15 − 20%	12.16	13.35	14.53	15.72	16.90	18.08	19.27	20.45	21.64	22.82	24.00	24.42	24.84	25.25	25.67	26.08	26.50	26.92	27.33	27.75	28.16
10 − 15%	11.02	12.20	13.39	14.57	15.76	16.94	18.12	19.31	20.49	21.68	22.86	23.28	23.69	24.11	24.52	24.94	25.36	25.77	26.19	26.60	27.02
5 − 10%	9.88	11.06	12.24	13.43	14.61	15.80	16.98	18.16	19.35	20.53	21.72	22.13	22.55	22.96	23.38	23.80	24.21	24.63	25.04	25.46	25.88
0 − 5%	8.73	9.92	11.10	12.28	13.47	14.65	15.84	17.02	18.20	19.39	20.57	20.99	21.40	21.82	22.24	22.65	23.07	23.48	23.90	24.32	24.73

Figure 4: The use of tables by the underconfident agent: the 2nd guess.

Ihre Schätzung war: 9

Mögliche Zufallzahl:

Leistungsintervall	−10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	27.01	28.20	29.38	30.56	31.75	32.93	34.12	35.30	36.48	37.67	38.85	40.04	41.22	42.40	43.59	44.77	45.96	47.14	48.32	49.51	49.92
90 – 95%	25.87	27.05	28.24	29.42	30.60	31.79	32.97	34.16	35.34	36.52	37.71	38.89	40.08	41.26	42.44	43.63	44.81	46.00	47.18	48.36	48.78
85 – 90%	24.72	25.91	27.09	28.28	29.46	30.64	31.83	33.01	34.20	35.38	36.56	37.75	38.93	40.12	41.30	42.48	43.67	44.85	46.04	47.22	47.64
80 – 85%	23.58	24.76	25.95	27.13	28.32	29.50	30.68	31.87	33.05	34.24	35.42	36.60	37.79	38.97	40.16	41.34	42.52	43.71	44.89	46.08	46.49
75 – 80%	22.44	23.62	24.80	25.99	27.17	28.36	29.54	30.72	31.91	33.09	34.28	35.46	36.64	37.83	39.01	40.20	41.38	42.56	43.75	44.93	45.35
70 – 75%	21.29	22.48	23.66	24.84	26.03	27.21	28.40	29.58	30.76	31.95	33.13	34.32	35.50	36.68	37.87	39.05	40.24	41.42	42.60	43.79	44.20
65 – 70%	20.15	21.33	22.52	23.70	24.88	26.07	27.25	28.44	29.62	30.80	31.99	33.17	34.36	35.54	36.72	37.91	39.09	40.28	41.46	42.64	43.06
60 – 65%	19.00	20.19	21.37	22.56	23.74	24.92	26.11	27.29	28.48	29.66	30.84	32.03	33.21	34.40	35.58	36.76	37.95	39.13	40.32	41.50	41.92
55 – 60%	17.86	19.04	20.23	21.41	22.60	23.78	24.96	26.15	27.33	28.52	29.70	30.88	32.07	33.25	34.44	35.62	36.80	37.99	39.17	40.36	40.77
50 – 55%	16.72	17.90	19.08	20.27	21.45	22.64	23.82	25.00	26.19	27.37	28.56	29.74	30.92	32.11	33.29	34.48	35.66	36.84	38.03	39.21	39.63
45 – 50%	15.57	16.76	17.94	19.12	20.31	21.49	22.68	23.86	25.04	26.23	27.41	28.60	29.78	30.96	32.15	33.33	34.52	35.70	36.88	38.07	38.48
40 – 45%	14.43	15.61	16.80	17.98	19.16	20.35	21.53	22.72	23.90	25.08	26.27	27.45	28.64	29.82	31.00	32.19	33.37	34.56	35.74	36.92	37.34
35 – 40%	13.28	14.47	15.65	16.84	18.02	19.20	20.39	21.57	22.76	23.94	25.12	26.31	27.49	28.68	29.86	31.04	32.23	33.41	34.60	35.78	36.20
30 – 35%	12.14	13.32	14.51	15.69	16.88	18.06	19.24	20.43	21.61	22.80	23.98	25.16	26.35	27.53	28.72	29.90	31.08	32.27	33.45	34.64	35.05
25 – 30%	11.00	12.18	13.36	14.55	15.73	16.92	18.10	19.28	20.47	21.65	22.84	24.02	25.20	26.39	27.57	28.76	29.94	31.12	32.31	33.49	33.91
20 – 25%	9.85	11.04	12.22	13.40	14.59	15.77	16.96	18.14	19.32	20.51	21.69	22.88	24.06	25.24	26.43	27.61	28.80	29.98	31.16	32.35	32.76
15 – 20%	8.71	9.89	11.08	12.26	13.44	14.63	15.81	17.00	18.18	19.36	20.55	21.73	22.92	24.10	25.28	26.47	27.65	28.84	30.02	31.20	31.62
10 – 15%	7.56	8.75	9.93	11.12	12.30	13.48	14.67	15.85	17.04	18.22	19.40	20.59	21.77	22.96	24.14	25.32	26.51	27.69	28.88	30.06	30.48
5 – 10%	6.42	7.60	8.79	9.97	11.16	12.34	13.52	14.71	15.89	17.08	18.26	19.44	20.63	21.81	23.00	24.18	25.36	26.55	27.73	28.92	29.33
0 – 5%	5.28	6.46	7.64	8.83	10.01	11.20	12.38	13.56	14.75	15.93	17.12	18.30	19.48	20.67	21.85	23.04	24.22	25.40	26.59	27.77	28.19

Figure 5: The use of tables by the underconfident agent: the 3rd guess.

Ihre Schätzung war: 6

Mögliche Zufallzahl:

Leistungsintervall	−10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	28.16	29.35	30.53	31.72	32.90	34.08	35.27	36.45	37.64	38.82	40.00	41.19	42.37	43.56	44.74	45.92	47.11	47.52	47.94	48.36	48.77
90 – 95%	27.02	28.20	29.39	30.57	31.76	32.94	34.12	35.31	36.49	37.68	38.86	40.04	41.23	42.41	43.60	44.78	45.96	46.38	46.80	47.21	47.63
85 – 90%	25.88	27.06	28.24	29.43	30.61	31.80	32.98	34.16	35.35	36.53	37.72	38.90	40.08	41.27	42.45	43.64	44.82	45.24	45.65	46.07	46.48
80 – 85%	24.73	25.92	27.10	28.28	29.47	30.65	31.84	33.02	34.20	35.39	36.57	37.76	38.94	40.12	41.31	42.49	43.68	44.09	44.51	44.92	45.34
75 – 80%	23.59	24.77	25.96	27.14	28.32	29.51	30.69	31.88	33.06	34.24	35.43	36.61	37.80	38.98	40.16	41.35	42.53	42.95	43.36	43.78	44.20
70 – 75%	22.44	23.63	24.81	26.00	27.18	28.36	29.55	30.73	31.92	33.10	34.28	35.47	36.65	37.84	39.02	40.20	41.39	41.80	42.22	42.64	43.05
65 – 70%	21.30	22.48	23.67	24.85	26.04	27.22	28.40	29.59	30.77	31.96	33.14	34.32	35.51	36.69	37.88	39.06	40.24	40.66	41.08	41.49	41.91
60 – 65%	20.16	21.34	22.52	23.71	24.89	26.08	27.26	28.44	29.63	30.81	32.00	33.18	34.36	35.55	36.73	37.92	39.10	39.52	39.93	40.35	40.76
55 – 60%	19.01	20.20	21.38	22.56	23.75	24.93	26.12	27.30	28.48	29.67	30.85	32.04	33.22	34.40	35.59	36.77	37.96	38.37	38.79	39.20	39.62
50 – 55%	17.87	19.05	20.24	21.42	22.60	23.79	24.97	26.16	27.34	28.52	29.71	30.89	32.08	33.26	34.44	35.63	36.81	37.23	37.64	38.06	38.48
45 – 50%	16.72	17.91	19.09	20.28	21.46	22.64	23.83	25.01	26.20	27.38	28.56	29.75	30.93	32.12	33.30	34.48	35.67	36.08	36.50	36.92	37.33
40 – 45%	15.58	16.76	17.95	19.13	20.32	21.50	22.68	23.87	25.05	26.24	27.42	28.60	29.79	30.97	32.16	33.34	34.52	34.94	35.36	35.77	36.19
35 – 40%	14.44	15.62	16.80	17.99	19.17	20.36	21.54	22.72	23.91	25.09	26.28	27.46	28.64	29.83	31.01	32.20	33.38	33.80	34.21	34.63	35.04
30 – 35%	13.29	14.48	15.66	16.84	18.03	19.21	20.40	21.58	22.76	23.95	25.13	26.32	27.50	28.68	29.87	31.05	32.24	32.65	33.07	33.48	33.90
25 – 30%	12.15	13.33	14.52	15.70	16.88	18.07	19.25	20.44	21.62	22.80	23.99	25.17	26.36	27.54	28.72	29.91	31.09	31.51	31.92	32.34	32.76
20 – 25%	11.00	12.19	13.37	14.56	15.74	16.92	18.11	19.29	20.48	21.66	22.84	24.03	25.21	26.40	27.58	28.76	29.95	30.36	30.78	31.20	31.61
15 – 20%	9.86	11.04	12.23	13.41	14.60	15.78	16.96	18.15	19.33	20.52	21.70	22.88	24.07	25.25	26.44	27.62	28.80	29.22	29.64	30.05	30.47
10 – 15%	8.72	9.90	11.08	12.27	13.45	14.64	15.82	17.00	18.19	19.37	20.56	21.74	22.92	24.11	25.29	26.48	27.66	28.08	28.49	28.91	29.32
5 – 10%	7.57	8.76	9.94	11.12	12.31	13.49	14.68	15.86	17.04	18.23	19.41	20.60	21.78	22.96	24.15	25.33	26.52	26.93	27.35	27.76	28.18
0 – 5%	6.43	7.61	8.80	9.98	11.16	12.35	13.53	14.72	15.90	17.08	18.27	19.45	20.64	21.82	23.00	24.19	25.37	25.79	26.20	26.62	27.04

Figure 6: The use of tables by the underconfident agent: the 4th guess.

Ihre Schätzung war: 0

Leistungsintervall	Mögliche Zufallzahl: −10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	30.47	31.65	32.84	34.02	35.20	36.39	37.57	38.76	39.94	41.12	42.31	42.72	43.14	43.56	43.97	44.39	44.80	45.22	45.64	46.05	46.47
90 – 95%	29.32	30.51	31.69	32.88	34.06	35.24	36.43	37.61	38.80	39.98	41.16	41.58	42.00	42.41	42.83	43.24	43.66	44.08	44.49	44.91	45.32
85 – 90%	28.18	29.36	30.55	31.73	32.92	34.10	35.28	36.47	37.65	38.84	40.02	40.44	40.85	41.27	41.68	42.10	42.52	42.93	43.35	43.76	44.18
80 – 85%	27.04	28.22	29.40	30.59	31.77	32.96	34.14	35.32	36.51	37.69	38.88	39.29	39.71	40.12	40.54	40.96	41.37	41.79	42.20	42.62	43.04
75 – 80%	25.89	27.08	28.26	29.44	30.63	31.81	33.00	34.18	35.36	36.55	37.73	38.15	38.56	38.98	39.40	39.81	40.23	40.64	41.06	41.48	41.89
70 – 75%	24.75	25.93	27.12	28.30	29.48	30.67	31.85	33.04	34.22	35.40	36.59	37.00	37.42	37.84	38.25	38.67	39.08	39.50	39.92	40.33	40.75
65 – 70%	23.60	24.79	25.97	27.16	28.34	29.52	30.71	31.89	33.08	34.26	35.44	35.86	36.28	36.69	37.11	37.52	37.94	38.36	38.77	39.19	39.60
60 – 65%	22.46	23.64	24.83	26.01	27.20	28.38	29.56	30.75	31.93	33.12	34.30	34.72	35.13	35.55	35.96	36.38	36.80	37.21	37.63	38.04	38.46
55 – 60%	21.32	22.50	23.68	24.87	26.05	27.24	28.42	29.60	30.79	31.97	33.16	33.57	33.99	34.40	34.82	35.24	35.65	36.07	36.48	36.90	37.32
50 – 55%	20.17	21.36	22.54	23.72	24.91	26.09	27.28	28.46	29.64	30.83	32.01	32.43	32.84	33.26	33.68	34.09	34.51	34.92	35.34	35.76	36.17
45 – 50%	19.03	20.21	21.40	22.58	23.76	24.95	26.13	27.32	28.50	29.68	30.87	31.28	31.70	32.12	32.53	32.95	33.36	33.78	34.20	34.61	35.03
40 – 45%	17.88	19.07	20.25	21.44	22.62	23.80	24.99	26.17	27.36	28.54	29.72	30.14	30.56	30.97	31.39	31.80	32.22	32.64	33.05	33.47	33.88
35 – 40%	16.74	17.92	19.11	20.29	21.48	22.66	23.84	25.03	26.21	27.40	28.58	29.00	29.41	29.83	30.24	30.66	31.08	31.49	31.91	32.32	32.74
30 – 35%	15.60	16.78	17.96	19.15	20.33	21.52	22.70	23.88	25.07	26.25	27.44	27.85	28.27	28.68	29.10	29.52	29.93	30.35	30.76	31.18	31.60
25 – 30%	14.45	15.64	16.82	18.00	19.19	20.37	21.56	22.74	23.92	25.11	26.29	26.71	27.12	27.54	27.96	28.37	28.79	29.20	29.62	30.04	30.45
20 – 25%	13.31	14.49	15.68	16.86	18.04	19.23	20.41	21.60	22.78	23.96	25.15	25.56	25.98	26.40	26.81	27.23	27.64	28.06	28.48	28.89	29.31
15 – 20%	12.16	13.35	14.53	15.72	16.90	18.08	19.27	20.45	21.64	22.82	24.00	24.42	24.84	25.25	25.67	26.08	26.50	26.92	27.33	27.75	28.16
10 – 15%	11.02	12.20	13.39	14.57	15.76	16.94	18.12	19.31	20.49	21.68	22.86	23.28	23.69	24.11	24.52	24.94	25.36	25.77	26.19	26.60	27.02
5 – 10%	9.88	11.06	12.24	13.43	14.61	15.80	16.98	18.16	19.35	20.53	21.72	22.13	22.55	22.96	23.38	23.80	24.21	24.63	25.04	25.46	25.88
0 – 5%	8.73	9.92	11.10	12.28	13.47	14.65	15.84	17.02	18.20	19.39	20.57	20.99	21.40	21.82	22.24	22.65	23.07	23.48	23.90	24.32	24.73

Figure 7: The use of tables by the unbiased agent: the 2nd guess.

Ihre Schätzung war: −4

Leistungsintervall	Mögliche Zufallzahl: −10	−9	−8	−7	−6	−5	−4	−3	−2	−1	0	1	2	3	4	5	6	7	8	9	10
95 – 100%	32.00	33.19	34.37	35.56	36.74	37.92	39.11	39.52	39.94	40.36	40.77	41.19	41.60	42.02	42.44	42.85	43.27	43.68	44.10	44.52	44.93
90 – 95%	30.86	32.04	33.23	34.41	35.60	36.78	37.96	38.38	38.80	39.21	39.63	40.04	40.46	40.88	41.29	41.71	42.12	42.54	42.96	43.37	43.79
85 – 90%	29.72	30.90	32.08	33.27	34.45	35.64	36.82	37.24	37.65	38.07	38.48	38.90	39.32	39.73	40.15	40.56	40.98	41.40	41.81	42.23	42.64
80 – 85%	28.57	29.76	30.94	32.12	33.31	34.49	35.68	36.09	36.51	36.92	37.34	37.76	38.17	38.59	39.00	39.42	39.84	40.25	40.67	41.08	41.50
75 – 80%	27.43	28.61	29.80	30.98	32.16	33.35	34.53	34.95	35.36	35.78	36.20	36.61	37.03	37.44	37.86	38.28	38.69	39.11	39.52	39.94	40.36
70 – 75%	26.28	27.47	28.65	29.84	31.02	32.20	33.39	33.80	34.22	34.64	35.05	35.47	35.88	36.30	36.72	37.13	37.55	37.96	38.38	38.80	39.21
65 – 70%	25.14	26.32	27.51	28.69	29.88	31.06	32.24	32.66	33.08	33.49	33.91	34.32	34.74	35.16	35.57	35.99	36.40	36.82	37.24	37.65	38.07
60 – 65%	24.00	25.18	26.36	27.55	28.73	29.92	31.10	31.52	31.93	32.35	32.76	33.18	33.60	34.01	34.43	34.84	35.26	35.68	36.09	36.51	36.92
55 – 60%	22.85	24.04	25.22	26.40	27.59	28.77	29.96	30.37	30.79	31.20	31.62	32.04	32.45	32.87	33.28	33.70	34.12	34.53	34.95	35.36	35.78
50 – 55%	21.71	22.89	24.08	25.26	26.44	27.63	28.81	29.23	29.64	30.06	30.48	30.89	31.31	31.72	32.14	32.56	32.97	33.39	33.80	34.22	34.64
45 – 50%	20.56	21.75	22.93	24.12	25.30	26.48	27.67	28.08	28.50	28.92	29.33	29.75	30.16	30.58	31.00	31.41	31.83	32.24	32.66	33.08	33.49
40 – 45%	19.42	20.60	21.79	22.97	24.16	25.34	26.52	26.94	27.36	27.77	28.19	28.60	29.02	29.44	29.85	30.27	30.68	31.10	31.52	31.93	32.35
35 – 40%	18.28	19.46	20.64	21.83	23.01	24.20	25.38	25.80	26.21	26.63	27.04	27.46	27.88	28.29	28.71	29.12	29.54	29.96	30.37	30.79	31.20
30 – 35%	17.13	18.32	19.50	20.68	21.87	23.05	24.24	24.65	25.07	25.48	25.90	26.32	26.73	27.15	27.56	27.98	28.40	28.81	29.23	29.64	30.06
25 – 30%	15.99	17.17	18.36	19.54	20.72	21.91	23.09	23.51	23.92	24.34	24.76	25.17	25.59	26.00	26.42	26.84	27.25	27.67	28.08	28.50	28.92
20 – 25%	14.84	16.03	17.21	18.40	19.58	20.76	21.95	22.36	22.78	23.20	23.61	24.03	24.44	24.86	25.28	25.69	26.11	26.52	26.94	27.36	27.77
15 – 20%	13.70	14.88	16.07	17.25	18.44	19.62	20.80	21.22	21.64	22.05	22.47	22.88	23.30	23.72	24.13	24.55	24.96	25.38	25.80	26.21	26.63
10 – 15%	12.56	13.74	14.92	16.11	17.29	18.48	19.66	20.08	20.49	20.91	21.32	21.74	22.16	22.57	22.99	23.40	23.82	24.24	24.65	25.07	25.48
5 – 10%	11.41	12.60	13.78	14.96	16.15	17.33	18.52	18.93	19.35	19.76	20.18	20.60	21.01	21.43	21.84	22.26	22.68	23.09	23.51	23.92	24.34
0 – 5%	10.27	11.45	12.64	13.82	15.00	16.19	17.37	17.79	18.20	18.62	19.04	19.45	19.87	20.28	20.70	21.12	21.53	21.95	22.36	22.78	23.20

Figure 8: The use of tables by the unbiased agent: the 3rd and the 4th guess.

B Misguided Learning: Additional Results

In this section, we present results complementing Section 4.2 of the paper. We describe decisions in the single-feedback rounds for the three types of agents in Section B.1. In Section B.2, we gather the estimates based on the pooled sample (described in the last paragraph in Section 4.2.3). In Section B.3, we present tables complementing Table 5 from the paper. Lastly, we present evidence on the model's performance.

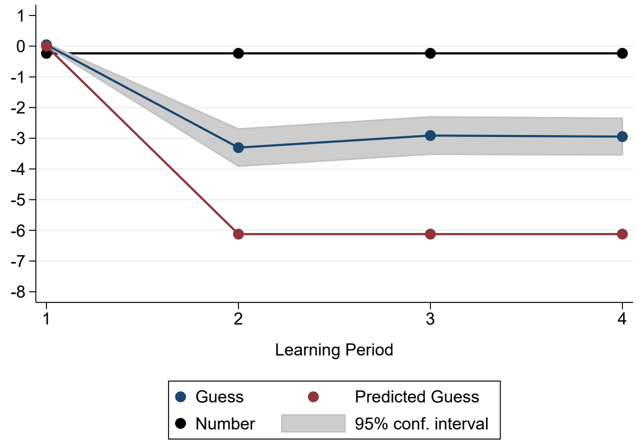
B.1 The single-feedback rounds

We present graphically the decisions of overconfident, underconfident, and unbiased agents in the single-feedback rounds. Figure 9 corresponds to Figures 2 and 3 in the paper. Recall that, in the single-feedback rounds, feedback was independent of subjects' guesses (participants were aware that the number displayed after the 2^{nd} and the 3^{rd} guess will be based on their 1^{st} guess). Thus, there is no reason for subjects to change their decisions – the predicted 2^{nd}, 3^{rd}, and 4^{th} guess are of the same value.

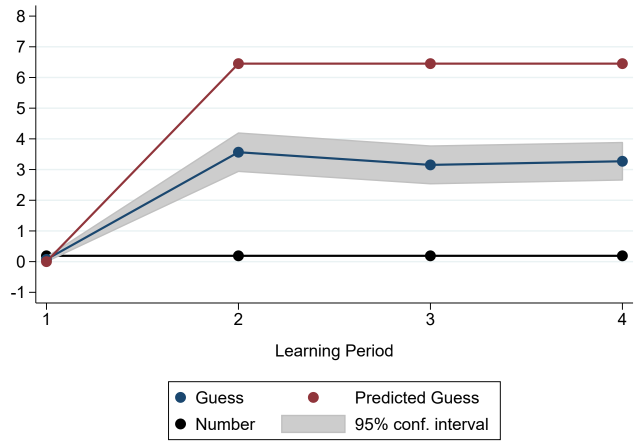
In Table 1, we present the results of comparing pairs of coefficients from regressions in Tables 3 and 4 in the paper. The tests are described in Sections 4.2.1 and 4.2.2 in the paper. Here, we only gather them in one table for completeness.

Figure 9: Learning process in the single-feedback rounds.

(a) Overconfident agents in SF Rounds.



(b) Underconfident agents in SF Rounds.



(c) Unbiased agents in SF Rounds.

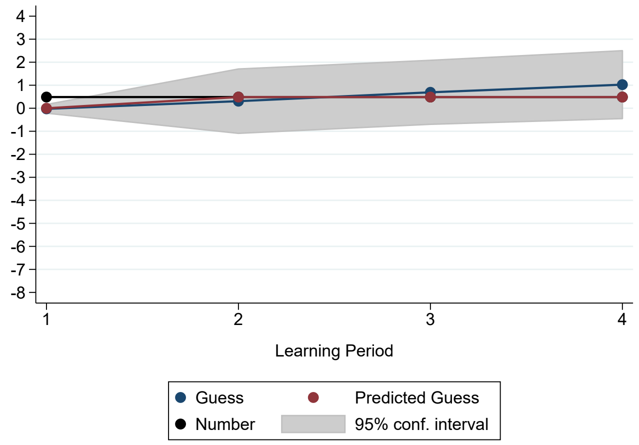


Table 1: The regression coefficients in the multiple- and single-feedback rounds in the ego-relevant condition.

(a) Overconfident Agents

	H_0: $\beta^2_{MF} \leq \beta^3_{MF}$	H_0: $\beta^3_{MF} \leq \beta^4_{MF}$	H_0: $\beta^2_{MF} \leq \beta^4_{MF}$
p-value	0.019**	0.159	0.003***
	H_0: $\beta^2_{SF} \leq \beta^3_{SF}$	H_0: $\beta^3_{SF} \leq \beta^4_{SF}$	H_0: $\beta^2_{SF} \leq \beta^4_{SF}$
p-value	0.953	0.431	0.958

(b) Unbiased Agents

	H_0: $\beta^2_{MF} = \beta^3_{MF}$	H_0: $\beta^3_{MF} = \beta^4_{MF}$	H_0: $\beta^2_{MF} = \beta^4_{MF}$
p-value	0.056*	0.885	0.102
	H_0: $\beta^2_{SF} = \beta^3_{SF}$	H_0: $\beta^3_{SF} = \beta^4_{SF}$	H_0: $\beta^2_{SF} = \beta^4_{SF}$
p-value	0.251	0.307	0.226

(c) Underconfident Agents

	H_0: $\beta^2_{MF} \leq \beta^3_{MF}$	H_0: $\beta^3_{MF} = \beta^4_{MF}$	
p-value	0.000***	0.681	
	H_0: $\beta^2_{SF} \leq \beta^3_{SF}$	H_0: $\beta^3_{SF} = \beta^4_{SF}$	
p-value	0.008***	0.394	

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B.2 The effect of providing informative feedback

In this section, we present the analysis based on pooled data from the multiple- and single-feedback rounds. We look at the effect of receiving informative feedback (the "MF Round" variable) on learning. In the specification presented in Table 2, the dependent variable is the difference between a subject's guess and the number. The results for overconfident agents are described in the last paragraph in Section 4.2.3. For underconfident agents, receiving informative feedback reduces the difference between a guess and the number by 1.29 in the 3^{rd} guess (one-tailed test: p-value = 0.000), and by 1.47 in the 4^{th} guess (one-tailed test: p-value = 0.000). The direction of the effect is in line with the model predictions.[1] As expected, informative feedback does not affect unbiased subjects. In another specification, presented in Table 3, we use the absolute difference between a guess and the number as a dependent variable.[2] Because of the absolute value, the effect in the second specification is positive for overconfident agents (informative feedback enlarges the absolute difference). Taking this into account, one can conclude that the two specifications yield consistent results.

In the specification presented in Table 4, the dependent variable is the difference between the 4^{th} and the 2^{nd} guess. We look at participants' decisions after the 2^{nd} guess, because only at this point the two conditions diverge (after the 1^{st} guess, participants received informative feedback both in the multiple- and single-feedback rounds). We interpret the difference between the 4^{th} and the 2^{nd} guess as a change in beliefs about the number in the final guesses. As it is evident in Table 4, being in a multiple-feedback round makes overconfident participants more pessimistic about the number by around -1.19, which constitutes 67% of the effect predicted by the model. In the case of underconfident agents, the coefficient captures the degree of correction after the second guess. It is equal to -1.23 (68% of the effect predicted by the model) and significant at the 1%-level. Taken together, the results support our claim that the effect is driven by the model's mechanism and not by external factors.

[1] The model predicts that in the 3^{rd} guess underconfident agents correct their decisions from the 2^{nd} guess. In the single-feedback rounds, however, this is no longer the case, as agents do not receive any meaningful feedback after the 2^{nd} guess. Consequently, the effect of being in a multiple-feedback round is negative – the sign indicates the correction after the second feedback.

[2] Although this specification might be viewed as more appropriate, we decided to include the other one in the main text because it can be directly linked to the graphs and the sign of the effect is indicative of agents' pessimism (optimism) about the number.

Table 2: The effect of feedback on the difference between a guess and the number.

	Overconfident (1)	Unbiased Agents (2)	Underconfident (3)
Dependent variable: the difference between the number and the 4th guess.			
MF Round	-1.810***	-0.128	-1.468***
	(0.391)	(0.422)	(0.268)
Const.	-1.264**	0.538	2.229***
	(0.545)	(0.408)	(0.526)
Dependent variable: the difference between the number and the 3rd guess.			
MF Round	-1.570***	0.256	-1.291***
	(0.363)	(0.215)	(0.287)
Const.	-1.230**	0.205	1.898***
	(0.531)	(0.154)	(0.500)
Dependent variable: the difference between the number and the 2nd guess.			
MF Round	-0.616*	0.051	-0.236
	(0.334)	(0.214)	(0.259)
Const.	-1.207**	-0.179	2.625***
	(0.550)	(0.185)	(0.558)
N	474	78	474

"MF Round" is a dummy variable taking value 1 if in a multiple-feedback round.
Controlling for subjects' relative performance does not change the results.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: The effect of feedback on the absolute difference between a guess and the number.

	Overconfident (1)	Unbiased Agents (2)	Underconfident (3)
Dependent variable: the absolute difference between the number and the 4^{th} guess.			
MF Round	1.211***	-0.333	-1.308***
	(0.303)	(0.423)	(0.235)
Const.	1.895***	0.949	2.924***
	(0.433)	(0.512)	(0.438)
Dependent variable: the absolute difference between the number and the 3^{rd} guess.			
MF Round	1.122***	0.0513	-1.350***
	(0.293)	(0.268)	(0.230)
Const.	1.692***	0.615**	2.737***
	(0.443)	(0.197)	(0.408)
Dependent variable: the absolute difference between the number and the 2^{nd} guess.			
MF Round	0.236	-0.205	-0.0928
	(0.221)	(0.206)	(0.212)
Const.	1.494***	0.333	3.086***
	(0.361)	(0.197)	(0.453)
N	474	78	474

"MF Round" is a dummy variable taking value 1 if in a multiple-feedback round.
Controlling for subjects' relative performance does not change the results.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: The effect of informative feedback on learning.

	Dependent variable: the difference between the 4^{th} and the 2^{nd} guess.		
	Overconfident	*Unbiased*	*Underconfident*
	(1)	(2)	(3)
MF Round	-1.194***	-0.179	-1.232***
	(0.337)	(0.499)	(0.267)
Const.	0.359*	0.718	-0.295*
	(0.205)	(0.559)	(0.153)
Observations	474	78	474

Note: The dependent variable is the difference between the 4^{th} and the 2^{nd} guess. The independent variable "MF Round" is a dummy variable taking value 1 if the round is a multiple-feedback round. Controlling for the number being guessed and subjects' relative performance does not change the results.

Standard errors clustered at the individual level. Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B.3 The effect of initial bias

In Table 5, we present the estimation results from Table 5 in the paper based on a sample of underconfident and overconfident agents excluding unbiased participants. While the coefficients are quantitatively different from the one in Table 5 in the paper, the direction of the effect remains the same. In Table 6, we gather corresponding results based on the data from the single-feedback rounds.

Table 5: The effect of bias in MF rounds (not including unbiased agents).

	Overconfident (1)		Underconfident (2)	
Dependent variable: the difference between a guess and the number in MF rounds. Independent variables: dummy variables for each guess and their interactions.				
2^{nd} guess MF	-2.162***	(0.608)	2.257***	(0.717)
3^{rd} guess MF	-2.949***	(0.645)	0.302	(0.557)
4^{th} guess MF	-3.248***	(0.713)	0.259	(0.597)
Bias	-0.782	(1.318)	-1.720	(1.798)
Bias × 2^{nd} guess MF	-5.191**	(2.495)	-2.654	(3.139)
Bias × 3^{rd} guess MF	-4.421*	(2.344)	-5.064**	(2.297)
Bias × 4^{th} guess MF	-4.337*	(2.608)	-4.985**	(2.448)
Const.	0.225	(0.454)	0.001	(0.498)
N	948		948	

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: The effect of bias in SF rounds (with and without unbiased agents).

	Overconfident or Unbiased (1)		Underconfident or Unbiased (2)	
Dependent variable: the difference between a guess and the number in SF rounds. Independent variables: dummy variables for each guess and their interactions.				
2^{nd} guess SF	-0.980*	(0.516)	1.761***	(0.562)
3^{rd} guess SF	-0.960*	(0.502)	1.569***	(0.533)
4^{th} guess SF	-0.836	(0.515)	2.022***	(0.544)
Bias	-0.305	(1.287)	0.215	(1.739)
Bias × 2^{nd} guess SF	-7.351***	(2.169)	-7.418**	(2.831)
Bias × 3^{rd} guess SF	-5.876***	(2.216)	-6.790***	(2.525)
Bias × 4^{th} guess SF	-6.295***	(2.050)	-5.035*	(2.623)
Const.	0.243	(0.420)	-0.137	(0.384)
N	1104		1104	

	Overconfident (1)		Underconfident (2)	
Dependent variable: the difference between a guess and the number in SF rounds. Independent variables: dummy variables for each guess and their interactions.				
2^{nd} guess SF	-1.821***	(0.661)	2.658***	(0.732)
3^{rd} guess SF	-2.033***	(0.613)	2.104***	(0.708)
4^{th} guess SF	-2.044***	(0.593)	2.632***	(0.707)
Bias	-1.531	(1.426)	1.079	(1.850)
Bias × 2^{nd} guess SF	-5.220**	(2.544)	-4.138	(3.274)
Bias × 3^{rd} guess SF	-3.155	(2.549)	-4.834	(2.999)
Bias × 4^{th} guess SF	-3.234	(2.299)	-2.805	(3.054)
Const.	0.727	(0.497)	0.100	(0.428)
N	948		948	

Standard errors clustered at individual level. Their values in parentheses.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

B.4 Model's performance

In this section we address the question of the model's explanatory power. We test how well the model explains our data and report the results in Tables 7, 8 and 9. Firstly, we pool the data from the multiple- and single-feedback rounds and look separately at early and late rounds. We refer to the first three rounds as "early rounds", and to the last three rounds as "late rounds". Secondly, we distinguish overconfident, underconfident, and unbiased agents; we look at the model's performance in the groups.

The model seems to better explain the data in early rounds (especially in the first round) than in later rounds. The results are in line with the observation that, during the experiment, subjects were updating their beliefs about their relative ability. At early stages of the experiment, subjects' beliefs were closer to those assumed in the model. The estimation results gathered in Table 9 demonstrate that choices of the unbiased agents are well-explained by the model. With the R^2 of 0.85 the model explains much variation in the data. The fit is less adequate in case of underconfident agents and much worse for overconfident subjects.

Table 7: Model's performance in early and late rounds.

	All Rounds	Early Rounds	Late Rounds	1^{st} Round
	(1)	(2)	(3)	(4)
Model	0.563***	0.633***	0.493***	0.688***
	(0.030)	(0.031)	(0.036)	(0.035)
Const.	-0.119	-0.102	-0.132	-0.0213
	(0.182)	(0.185)	(0.217)	(0.213)
R^2	0.523	0.605	0.441	0.696
N	3078	1539	1539	513

The dependent variable denotes subjects' actual guesses. The independent variable "Model" denotes guesses predicted by the model.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Model's performance in the multiple- and single-feedback rounds.

	All Rounds		Early Rounds		Late Rounds	
	(SF)	(MF)	(SF)	(MF)	(SF)	(MF)
Model	0.559***	0.563***	0.609***	0.650***	0.502***	0.482***
	(0.034)	(0.032)	(0.040)	(0.033)	(0.043)	(0.042)
Const.	0.0731	-0.310	0.150	-0.340	-0.0499	-0.213
	(0.212)	(0.181)	(0.249)	(0.193)	(0.268)	(0.239)
R^2	0.516	0.522	0.567	0.634	0.458	0.422
N	1539	1539	813	726	726	813

The dependent variable denotes subjects' actual guesses. The independent variable "Model" denotes guesses predicted by the model.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: Model's performance for overconfident, underconfident and unbiased agents.

	Overconfident	Unbiased Agents	Underconfident
Model	0.575***	0.969***	0.689***
	(0.068)	(0.028)	(0.035)
Const.	0.247	0.220	-1.151***
	(0.312)	(0.132)	(0.220)
R^2	0.182	0.850	0.463
N	1422	234	1422

The dependent variable denotes subjects' actual guesses. The independent variable "Model" denotes guesses predicted by the model.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

C Revealed Beliefs

C.1 Deriving beliefs from guesses

The data from Confidence I and II tells us little about the changes in subjects' beliefs about their performance *during* the learning exercise. To investigate this issue, we attempt to retrieve agents' beliefs from their guesses. The experimental design enables us to divulge the beliefs about one's relative performance with few additional assumptions. The loss-function specification implies that the myopically optimal action is to enter one's beliefs about the number in every guess. There is only one ability level that "rationalizes" the agent's optimal guess, given the feedback he obtained. Thus, to derive agents' beliefs from their actions, we need to assume that the participants chose optimally in every period and without errors.

Assumption R1. (Optimal Actions)

The agent chooses his action optimally and without mistakes in every period.

In every round, we can derive beliefs about the relative performance parameter from the 2^{nd}, the 3^{rd} and the 4^{th} guess. In principle, we can use all 18 revealed beliefs to examine beliefs formation during the task. However, we decided to use only beliefs revealed from the second guess in each round to obtain a less noisy measure (agents might make more mistakes or start experimenting in later trials).

Assumption R2. (Updating at the beginning of the round)

The agents updates beliefs about his performance right before the second guess each round and keeps them unchanged till the beginning of the next round. In other words, the second guess in each round reveals the agent's beliefs in that round.

C.2 Beliefs revealed in rounds 1 to 6

It is instructive to juxtapose the revealed beliefs with the beliefs elicited before and after the learning exercise. In Figure 10, we present the mean relative performance, beliefs elicited in Confidence I and Confidence II, and beliefs retrieved from the 2nd guess in each round. The beliefs derived from agents' guesses seem to be consistent with the beliefs elicited before and after the learning exercise.[3] From the first to the last round, we observe a gradual change in beliefs in the direction of the true performance level for the overconfident and underconfident agents. The cumulative effect of updating over rounds, measured as the difference between beliefs revealed in the first and last round, is significant for the overconfident and underconfident, but not for the unbiased agents.

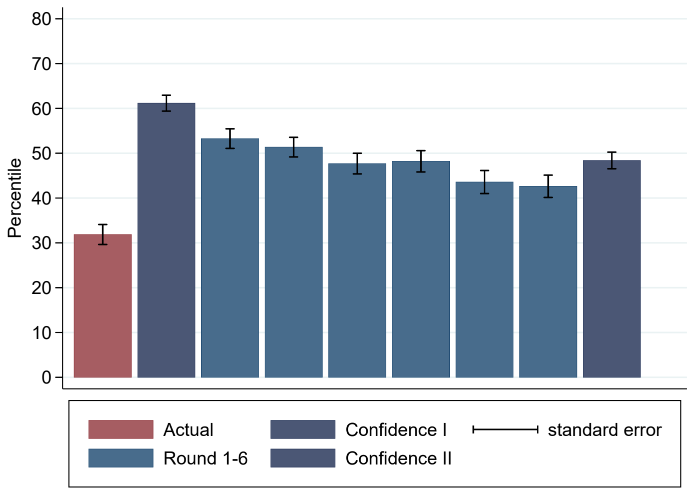
To describe the revealed beliefs, complementing the data discussed so far, we present the distributions of beliefs in terms of subjects' bias. In Figure 11, we present the distribution of bias based on the beliefs elicited in Confidence I and II in panels (a) and (h), and the bias based on the beliefs revealed in rounds 1 to 6 in panels (b) to (g). There is a notable heterogeneity among participants with respect to the magnitude of bias. The distribution changes visibly from round to round, with more participants becoming unbiased towards the end of the experiment. Neither the distributions presented in panels (a) and (b), nor the distributions shown in (g) and (h), are alike.[4] It might be due to the differences in the two elicitation methods or the feedback provided to the subjects (see footnote 2). In particular, the feedback provided after the 1st guess is likely to have a large effect on beliefs revealed in the first round.

[3]When comparing the elicited and revealed beliefs one should keep in mind several points. Firstly, between Confidence I and the 2nd guess in Round 1, as well as the 2nd guess in Round 6 and Confidence II, agents received feedback that was likely to change their beliefs. Secondly, the two elicitation methods are very different, and participants may not be invariant to the two procedures.

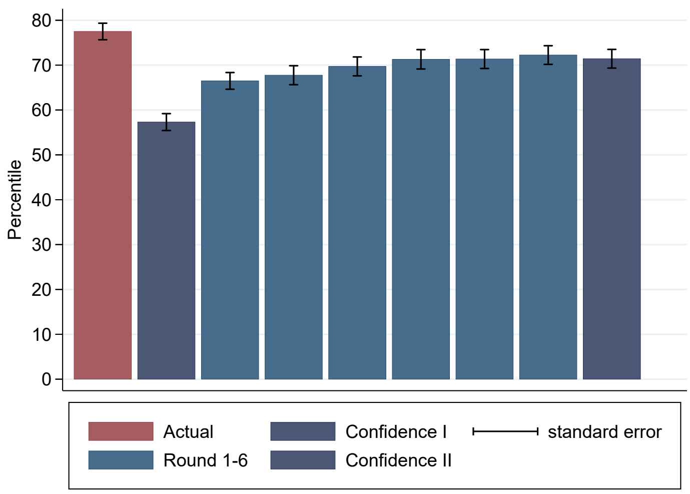
[4]Looking at the last two panels, one can notice that over 35% of all participants entered their choices in Round 6 as if they were unbiased, but only 25% indicated their actual performance as a switching probability in Confidence II. We suspect that the difference is due to dissimilar elicitation methods or agents' (unwarranted) attempt to hedge, rather than participants "unlearning" their abilities at the end of the last round.

Figure 10: Mean actual performance, elicited and revealed beliefs.
(classification of types based on Confidence I)

(a) Overconfident Agents



(b) Underconfident Agents



(c) Unbiased Agents

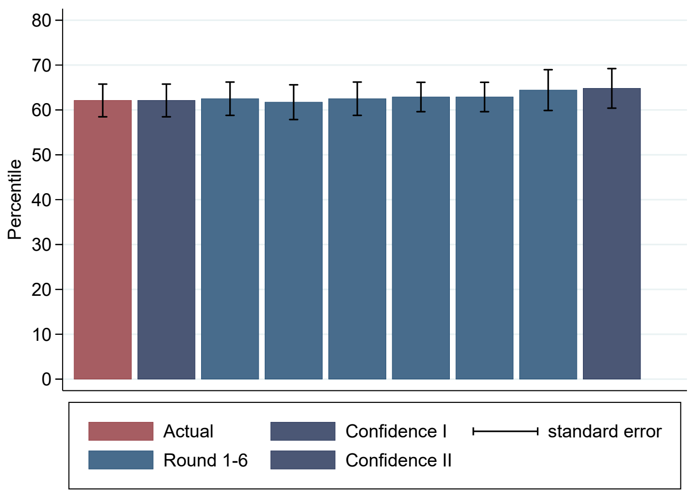
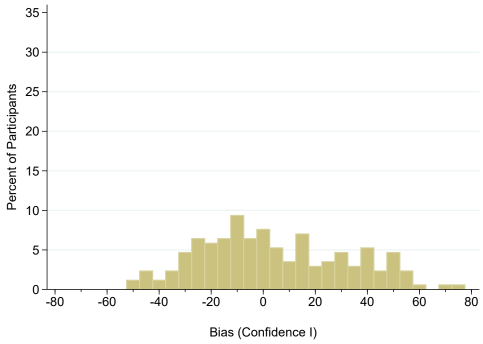
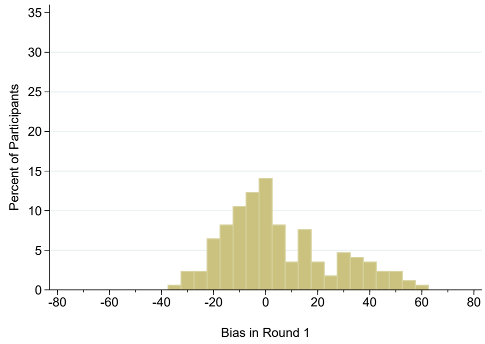


Figure 11: Distribution of participants' bias.

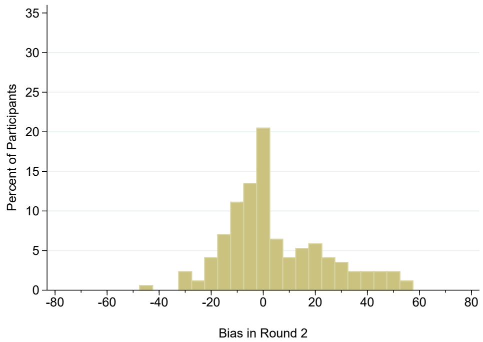
(a) Bias elicited in Confidence I.



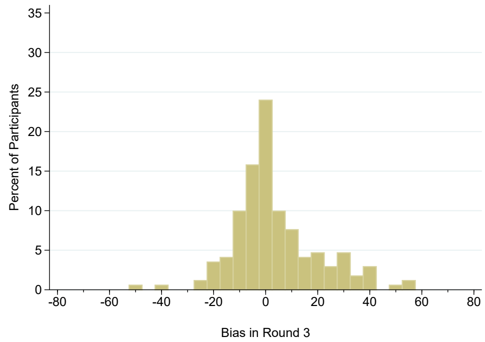
(b) Bias revealed in Round 1.



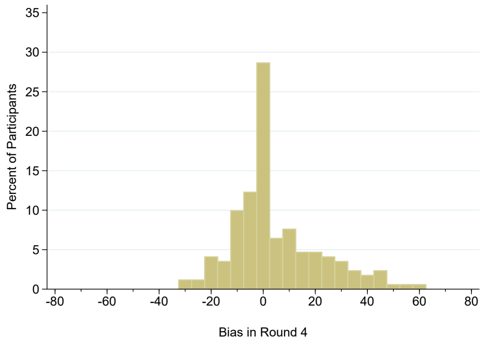
(c) Bias revealed in Round 2.



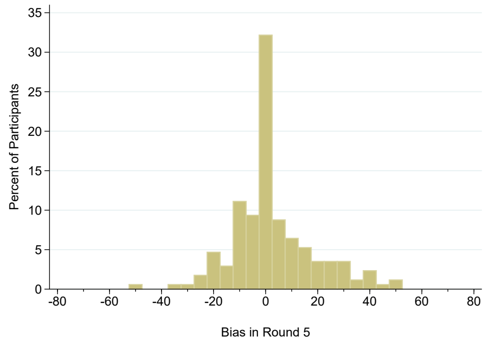
(d) Bias revealed in Round 3.



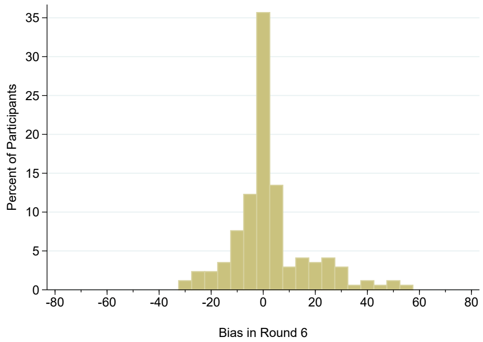
(e) Bias revealed in Round 4.



(f) Bias revealed in Round 5.



(g) Bias revealed in Round 6.



(h) Bias elicited in Confidence II.

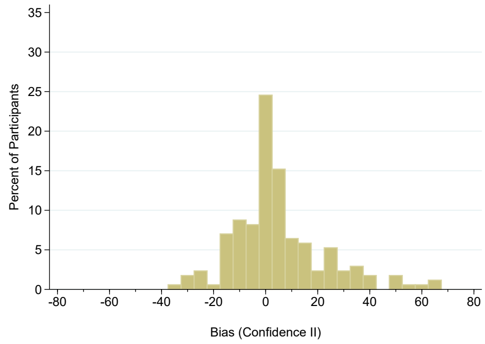


Table 10: The frequency of participants becoming unbiased during the experiment.

	Conf. I	R1	R2	R3	R4	R5	R6	**Conf. II**
Overconfident*	0	9	7	9	10	14	17	14
Unbiased	13	12	12	12	12	12	12	4
Underconfident	0	3	16	20	27	29	32	24
All subjects	13	24	35	41	49	55	61	42

* Classification based on Confidence I.

Table 10 presents the number of participants becoming unbiased during the course of the experiment based on beliefs elicited (Conf. I and Conf. II), and revealed (R1 to R6). The agents classified as underconfident in Confidence I are more likely to become unbiased during the experiment than the overconfident agents. 32 participants out of 79 classified as underconfident entered their guesses in the sixth round as if they were unbiased, but only 17 out of 79 overconfident agents did so. Almost all agents classified as unbiased in Confidence I entered their choices as if they were unbiased, but only one third of them indicated the switching point equal to their relative performance in Confidence II. We can only speculate whether the agents were driven by an impulse to hedge, or encountering no difficulties during the main task served as some kind of a signal.

C.3 Model predictions based on revealed beliefs

So far, we have tested the model's predictions assuming that there is no change in agents' beliefs during the experiment. We relax this assumption here, allowing agents to update their beliefs at the beginning of each round. For each agent, we calculate the predicted actions based on his revealed beliefs.

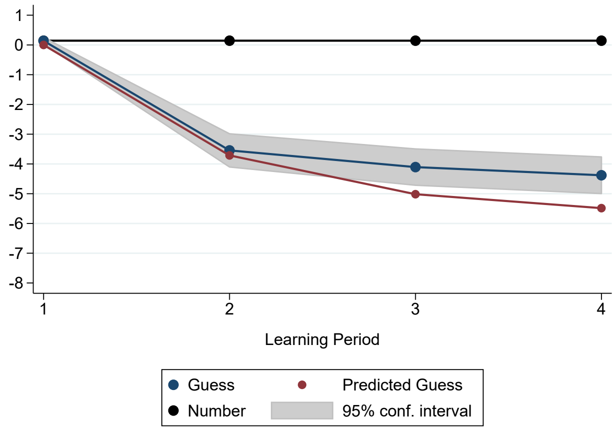
In Figure 12, we plot the average actual guess and the average guess predicted by the model, separately for the overconfident, underconfident and unbiased agents in the multiple- and single-feedback rounds. Compared to the model predictions based on elicited beliefs, the average predicted guesses (in red) are much closer to the actual choices (in blue). The better fit is reflected in the regression estimates in Table 11. The coefficients of the Model variable are higher than the respective coefficients in Tables 7 and 8 in the previous section, and now there is little difference between the early and late rounds. Overall, the model explains 73.5% variation in the data. Moreover, it does a much better job at explaining the choices of overconfident and underconfident agents, in comparison to the analysis based on elicited beliefs.

Secondly, we re-examine the impact of agent's bias on learning. To this end, we look at the distance between the agent's guess and the number. We classify participants as overconfident, underconfident or unbiased on the basis of their revealed beliefs.[5] In Table 12, we gathered the estimates for subjects' guesses in the multiple-feedback rounds. Comparing with the results based on elicited beliefs (see Table 5 in the paper), the effect of subjects' bias is much stronger. For overconfident agents, subjects' guesses are no longer significant unless interacted with participant's bias. It should not come as a surprise, since the main mechanism of the model operates through the agent's bias. Using a more accurate measure of beliefs leads to a higher and more precise estimates of the effect of subjects' bias.

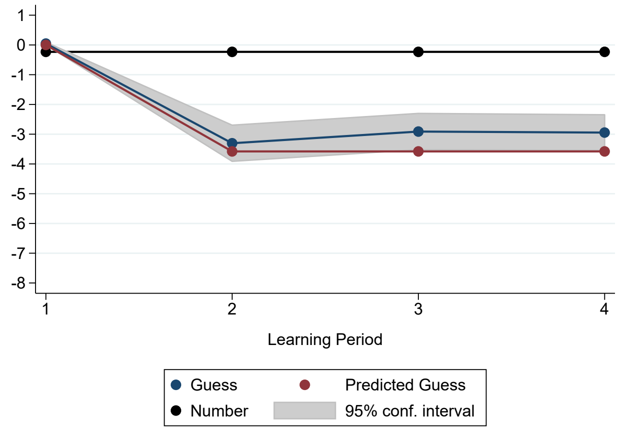
The results presented in this section lend further support to the claim that the differences between theoretical predictions based on elicited beliefs and the actual guesses are due to participants learning about their ability during the task. If we use an alternative measure of beliefs, allowing for updating from round to round, the model closely tracts subjects' behavior.

[5]It is possible for an agent to change his type at the beginning of a round. For this reason, the groups of overconfident and underconfident agents are no longer equinumerous.

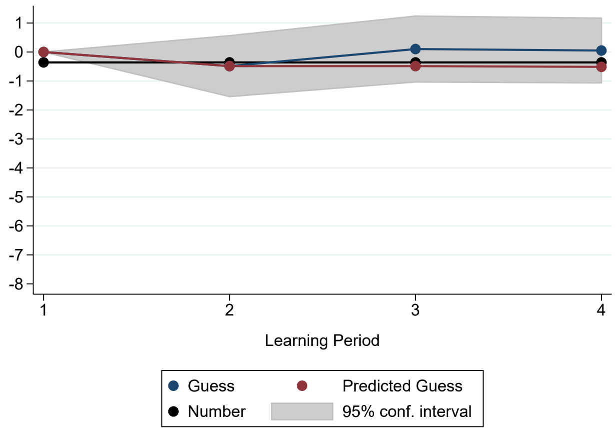
Figure 12. The estimated numbers, the participants' actual and predicted guesses.



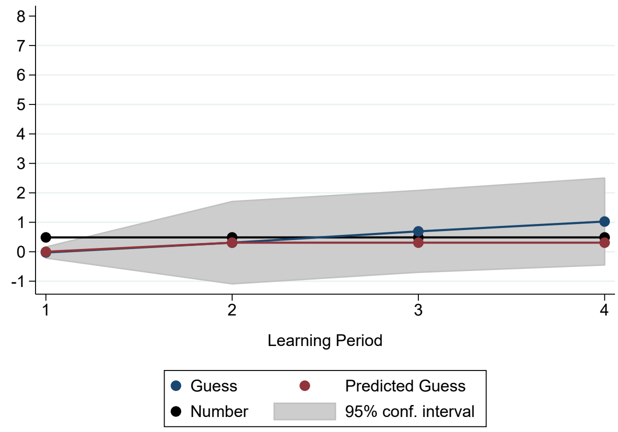
(a) Overconfident agents in MF Rounds.



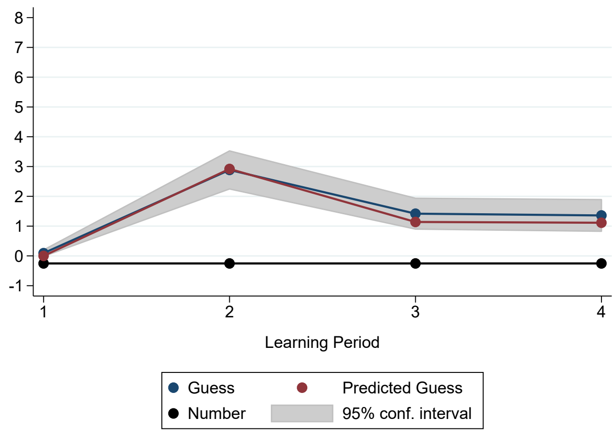
(b) Overconfident agents in SF Rounds.



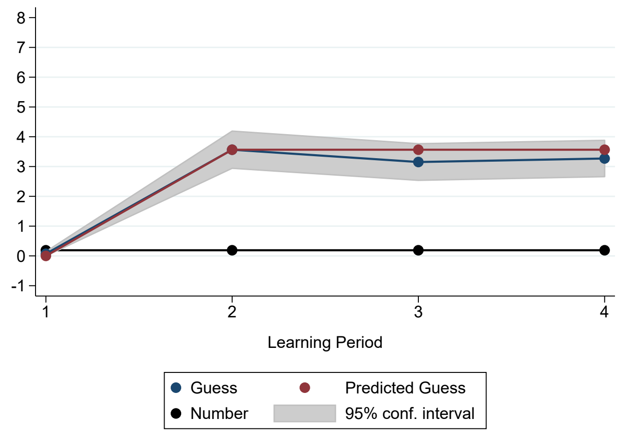
(c) Unbiased agents in MF Rounds.



(d) Unbiased agents in SF Rounds.



(e) Underconfident agents in MF Rounds.



(f) Underconfident agents in SF Rounds.

Table 11: How well the model predicts the 3rd and 4th guess.

	All Rounds	Early Rounds	Late Rounds
Model	0.831***	0.826***	0.838***
	(0.025)	(0.030)	(0.030)
Const.	0.242**	0.238*	0.247*
	(0.091)	(0.119)	(0.096)
R^2	0.735	0.742	0.728
N	2052	1026	1026

	All Rounds		Early Rounds		Late Rounds	
	SF	MF	SF	MF	SF	MF
Model	0.834***	0.832***	0.818***	0.835***	0.854***	0.827***
	(0.027)	(0.033)	(0.040)	(0.040)	(0.030)	(0.045)
Const.	0.181	0.305**	0.260	0.238	0.104	0.362**
	(0.126)	(0.110)	(0.189)	(0.188)	(0.151)	(0.117)
R^2	0.758	0.697	0.751	0.706	0.767	0.684
N	1026	1026	542	484	484	542

	Overconfident	Unbiased Agents	Underconfident
Model	0.753***	0.890***	0.860***
	(0.046)	(0.056)	(0.037)
Const.	-0.261	0.554	0.282
	(0.179)	(0.286)	(0.149)
R^2	0.534	0.743	0.744
N	948	156	948

Classification of confidence types was based on elicited beliefs.

The dependent variable denotes subjects' actual guesses (the 3rd and 4th guess). The independent variable "Model" denotes guesses predicted by the model.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12: The effect of revealed bias on learning in multiple-feedback (MF) rounds.

	Classification of types based on revealed beliefs:			
	Overconfident or Unbiased (1)		Underconfident or Unbiased (2)	
Dependent variable: the difference between a guess and the number in MF rounds. Independent variables: dummy variables for each guess and their interactions.				
2^{nd} guess MF	-0.060	(0.260)	1.230^{***}	(0.338)
3^{rd} guess MF	-0.248	(0.327)	0.646^{**}	(0.300)
4^{th} guess MF	-0.487^{*}	(0.288)	0.455	(0.300)
Bias	-2.241^{*}	(1.150)	-15.419^{***}	(1.897)
Bias × 2^{nd} guess MF	-20.358^{***}	(0.976)	-16.713^{***}	(3.449)
Bias × 3^{rd} guess MF	-18.206^{***}	(2.480)	-3.182	(2.828)
Bias × 4^{th} guess MF	-19.542^{***}	(1.858)	-6.434^{**}	(2.448)
Const.	-0.038	(0.263)	-0.595^{**}	(0.285)
N	1348		1220	

"Bias" is based on beliefs revealed at the beginning of each round. It takes values between -1 and 1; positive values for overconfident and negative values for underconfident agents.

Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

D Ego-neutral Condition

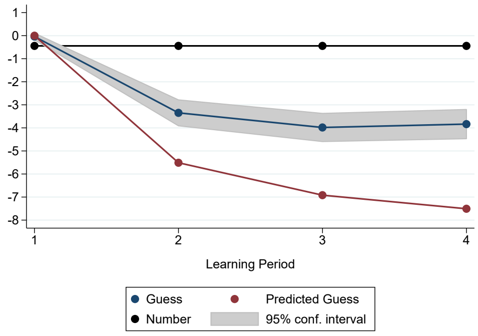
In this section, we present the results from the ego-neutral control condition. First of all, we analyze the data in the same way as our main dataset: we re-do the analysis described in Section 4.2 in the paper using the data from the ego-neutral condition. Secondly, we combine the two datasets and analyze them jointly, complementing the results presented in Section 5 in the paper.

D.1 Misguided learning in the ego-neutral condition

In Figures 12 and 13, we present the learning outcomes of overconfident and underconfident participants in the ego-neutral condition. Tables 13 and 14 contain the results of the corresponding regressions, and in Table 15 we gather the results of comparing pairs of coefficients. Overall, one can notice learning trajectories similar to those of overconfident and underconfident participants in the ego-relevant condition. A slight improvement could be spotted in the last guess of overconfident subjects in the multiple-feedback rounds. Those subjects seem to correct their choices in the direction of the true state. However, the correction is not significant at any acceptable level. Misguided learning is not eliminated in the ego-neutral condition, pointing towards the role of biased beliefs as its main source.

Figure 12: The learning process in the ego-neutral control (multiple-feedback rounds).

(a) Overconfident agents in MF Rounds.



(b) Underconfident agents in MF Rounds.

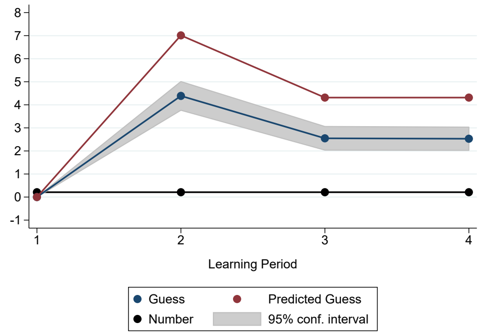


Table 13: The learning process in the ego-neutral control (multiple-feedback rounds).

	Overconfident (1)	Unbiased Agents (2)	Underconfident (3)
Dependent variable: difference between a guess and the number in the SF rounds. Independent variables: dummy variables for each guess in the SF rounds.			
2nd guess MF	-3.311***	0.407	4.388***
	(0.337)	(0.510)	(0.376)
3rd guess MF	-3.945***	0.296	2.548***
	(0.404)	(0.629)	(0.290)
4th guess MF	-3.799***	-0.074	2.530***
	(0.429)	(0.885)	(0.300)
Const.	0.406	-0.148	-0.210
	(0.756)	(0.749)	(0.246)
N	876	108	876

Note: The coefficients at the 2nd, 3rd, and 4th guess SF remain unchanged if we control for subjects' relative performance (their actual position in the IQ test score distribution). Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 13: The learning process in the ego-neutral control (single-feedback rounds).

(a) Overconfident agents in SF Rounds.

(b) Underconfident agents in SF Rounds.

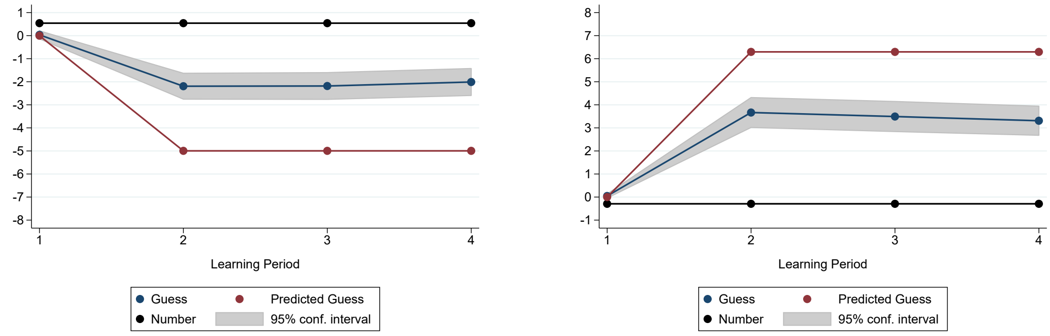


Table 14: The learning process in the ego-neutral control (single-feedback rounds).

	Overconfident (1)	Unbiased Agents (2)	Underconfident (3)
Dependent variable: difference between a guess and the number in MF rounds. Independent variables: dummy variables for each guess in the MF rounds.			
2nd guess SF	-2.228***	1.185***	3.621***
	(0.341)	(0.324)	(0.352)
3rd guess SF	-2.219***	1.000***	3.447***
	(0.353)	(0.225)	(0.358)
4th guess SF	-2.045***	1.370***	3.265***
	(0.387)	(0.371)	(0.343)
Const.	-0.507**	-1.185**	0.337
	(0.222)	(0.494)	(0.250)
N	876	108	876

Note: The coefficients at the 2nd, 3rd, and 4th guess MF remain unchanged if we control for subjects' relative performance (their actual position in the IQ test score distribution). Standard errors clustered at individual level. Their values in parentheses.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Comparison of the regression coefficients in the multiple- and single-feedback rounds in the ego-neutral condition.

(a) Overconfident Agents

	H_0: $\beta^2_{MF} \leq \beta^3_{MF}$	H_0: $\beta^3_{MF} \leq \beta^4_{MF}$	H_0: $\beta^2_{MF} \leq \beta^4_{MF}$
p-value	0.002***	0.725	0.027**
	H_0: $\beta^2_{SF} \leq \beta^3_{SF}$	H_0: $\beta^3_{SF} \leq \beta^4_{SF}$	H_0: $\beta^2_{SF} \leq \beta^4_{SF}$
p-value	0.524	0.890	0.879

(b) Unbiased Agents

	H_0: $\beta^2_{MF} = \beta^3_{MF}$	H_0: $\beta^3_{MF} = \beta^4_{MF}$	H_0: $\beta^2_{MF} = \beta^4_{MF}$
p-value	0.846	0.399	0.617
	H_0: $\beta^2_{SF} = \beta^3_{SF}$	H_0: $\beta^3_{SF} = \beta^4_{SF}$	H_0: $\beta^2_{SF} = \beta^4_{SF}$
p-value	0.282	0.174	0.184

(c) Underconfident Agents

	H_0: $\beta^2_{MF} \leq \beta^3_{MF}$	H_0: $\beta^3_{MF} = \beta^4_{MF}$
p-value	0.000***	0.897
	H_0: $\beta^2_{SF} \leq \beta^3_{SF}$	H_0: $\beta^3_{SF} = \beta^4_{SF}$
p-value	0.070*	0.009***

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

D.2 Differences between subjects in the two conditions

As we have already mentioned in the paper, there is little difference between the treatment and the control group (see Table 6 in the paper) in the average relative performance or initial bias about own performance. If we look separately at the group of overconfident and underconfident participants (defined with respect to own performance) in the two conditions, there is a small difference in the performance of underconfident agents that is significant at the 10% level. Also, there are small differences in the initial bias within each group. We suspect that these differences are a consequence of having a relatively small sample. The exact values and tests in the two groups are gathered in Table 16.

However, there are significant differences between overconfident subjects (with respect to own performance) in the ego-relevant condition and overconfident subjects (with respect to the other's performance) in the ego-neutral condition. One consequence of the random assignment of partners in the ego-neutral control is that the negative correlation between the decision-maker's performance and his bias is absent in this condition. The high (low) performing participants in the ego-neutral condition are not necessarily underconfident (overconfident) about the other's performance. As a result, the average performance of overconfident subjects in the ego-neutral condition is higher than that of the overconfident subjects in the ego-relevant condition, and the average performance of underconfident subjects in the ego-neutral condition is lower than that of the underconfident subjects in the ego-relevant condition. The exact values and tests for overconfident and underconfident agents could be found in Table 17. We address this concern in the analysis by controlling for the performance of the decision-maker and his initial bias.

Table 16: Differences between biased participants in the two conditions (overconfidence and underconfidence defined with respect to own performance).

	Underconfident		**p-value**		
	Ego-neutral	**Ego-relevant**	H_0: Diff <0	Diff $\neq 0$	Diff >0
Performance	0.817 (0.021)	0.775 (0.018)	0.935	0.130	0.065
Initial Bias	-0.233 (0.019)	-0.202 (0.014)	0.088	0.177	0.912
N	69	79			

	Overconfident		**p-value**		
	Ego-neutral	**Ego-relevant**	H_0: Diff <0	Diff $\neq 0$	Diff >0
Performance	0.349 (0.023)	0.319 (0.022)	0.825	0.349	0.175
Initial Bias	0.256 (0.019)	0.293 (0.020)	0.090	0.181	0.910
N	71	79			

Table 17: Differences between biased participants in the two conditions (in the ego-neutral condition, overconfidence and underconfidence defined with respect to the other's performance).

	Underconfident		**p-value**		
	Ego-neutral	**Ego-relevant**	H_0: Diff <0	Diff $\neq 0$	Diff >0
Performance	0.634 (0.032)	0.775 (0.018)	0.000	0.000	1.000
Initial Bias	-0.218 (0.014)	-0.202 (0.014)	0.212	0.424	0.788
N	73	79			

	Overconfident		**p-value**		
	Ego-neutral	**Ego-relevant**	H_0: Diff <0	Diff $\neq 0$	Diff >0
Performance	0.532 (0.035)	0.319 (0.022)	1.000	0.000	0.000
Initial Bias	0.247 (0.018)	0.293 (0.020)	0.043	0.086	0.957
N	73	79			

D.3 Learning in the ego-relevant and ego-neutral conditions

In this section, we present results complementing Tables 7 and 8 in the paper. In Tables 18 and 19, we present the regressions from Tables 7 and 8 in the paper controlling for the model's predictions (decisions implied by the model). The effect remains strong and significant for both overconfident and underconfident agents, with the regression coefficients similar to those in our initial specifications.

Furthermore, we present the effect of the ego-relevant condition on learning in the remaining guesses – those not included in Tables 7 and 8 in the paper. In Tables 20 and 21, we show the results for the 2^{nd} and 3^{rd} guess of overconfident agents. The coefficients at the "Ego-relevant" variable in the 2^{nd} and 3^{rd} guess are slightly lower than the corresponding coefficients in the last guess (Table 7 in the paper) but remain positive and highly significant. In Tables 22 and 23, we present the results for the 3^{rd} and 4^{th} guess of underconfident agents. The difference between the ego-relevant and ego-neutral conditions in the 3^{rd} and 4^{th} guess is smaller than in the 2^{nd} guess. This should not come as a surprise: learning of underconfident agents is characterized by overshooting in the second guess, and one would expect the largest differences in decisions after the first feedback. Still, the sign of the effect in the 3^{rd} and 4^{th} guess is in line with our interpretation that underconfident agents become less mistaken about the state in the ego-relevant condition.

Table 18: The effect of ego-relevance on learning of overconfident subjects.

	Dependent variable: the absolute difference between the 4^{th} guess and the number.		
	(1)	(2)	(3)
Ego-relevant	1.085**	1.632***	1.553***
	(0.520)	(0.510)	(0.243)
Controls 1	No	Yes	Yes
Controls 2	No	No	Yes
Controls 3	Yes	Yes	Yes
Observations	456	456	456

Note: The dependent variable is the absolute difference between the 4^{th} guess and the number. The sample includes only overconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. Controls 3 include the decisions implied by the model.

Standard errors clustered at the individual level. Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 19: The effect of ego-relevance on learning of underconfident subjects.

	Dependent variable: the absolute difference between the 2^{nd} guess and the number.		
	(1)	(2)	(3)
Ego-relevant	-0.695*	-0.916**	-0.900***
	(0.396)	(0.385)	(0.371)
Controls 1	No	Yes	Yes
Controls 2	No	No	Yes
Controls 3	Yes	Yes	Yes
Observations	456	456	456

Note: The dependent variable is the absolute difference between the 2^{nd} guess and the number. The sample includes only underconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. Controls 3 include the decisions implied by the model.

Standard errors clustered at the individual level. Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Treatment effect on learning of overconfident agents in the 2nd guess.

	Dependent variable: the absolute difference between the 2^{nd} guess and the number.				
	(1)	(2)	(3)	(4)	(5)
Ego-relevant	0.969**	1.322***	1.294***	1.232***	1.019***
	(0.404)	(0.354)	(0.309)	(0.286)	(0.280)
Controls 1	No	Yes	Yes		
Controls 2	No	No	Yes		
Adjustment Type	Regression	Regression	Regression	Matching	Matching
Observations	456	456	456	456	456

Note: The dependent variable is the absolute difference between the 2nd guess and the number. The sample includes only overconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. In the matching estimator, observations are matched to the nearest neighbor based on the relative performance (Specification 4), and the initial bias and relative performance (Specification 5). In Specification 1-3, standard errors clustered at the individual level. In Specification 4-5, consistent standard errors as in Abadie and Imbens (2006). Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: Treatment effect on learning of overconfident agents in the 3rd guess.

	Dependent variable: the absolute difference between the 3^{rd} guess and the number.				
	(1)	(2)	(3)	(4)	(5)
Ego-relevant	0.869*	1.330***	1.363***	1.228***	1.160***
	(0.520)	(0.495)	(0.443)	(0.367)	(0.347)
Controls 1	No	Yes	Yes		
Controls 2	No	No	Yes		
Adjustment Type	Regression	Regression	Regression	Matching	Matching
Observations	456	456	456	456	456

Note: The dependent variable is the absolute difference between the 3rd guess and the number. The sample includes only overconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. In the matching estimator, observations are matched to the nearest neighbor based on the relative performance (Specification 4), and the initial bias and relative performance (Specification 5). In Specification 1-3, standard errors clustered at the individual level. In Specification 4-5, consistent standard errors as in Abadie and Imbens (2006). Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 22: Treatment effect on learning of underconfident agents in the 3rd guess.

	Dependent variable: the absolute difference between the 3^{rd} guess and the number.				
	(1)	(2)	(3)	(4)	(5)
Ego-relevant	-0.480	-0.664**	-0.514*	-0.657***	-0.452*
	(0.303)	(0.303)	(0.286)	(0.220)	(0.242)
Controls 1	No	Yes	Yes		
Controls 2	No	No	Yes		
Adjustment Type	Regression	Regression	Regression	Matching	Matching
Observations	456	456	456	456	456

Note: The dependent variable is the absolute difference between the 3rd guess and the number. The sample includes only underconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. In the matching estimator, observations are matched to the nearest neighbor based on the relative performance (Specification 4), and the initial bias and relative performance (Specification 5). In Specification 1-3, standard errors clustered at the individual level. In Specification 4-5, consistent standard errors as in Abadie and Imbens (2006). Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 23: Treatment effect on learning of underconfident agents in the 4th guess.

	Dependent variable: the absolute difference between the 4^{th} guess and the number.				
	(1)	(2)	(3)	(4)	(5)
Ego-relevant	-0.344	-0.525*	-0.398	-0.515**	-0.300
	(0.320)	(0.308)	(0.290)	(0.225)	(0.212)
Controls 1	No	Yes	Yes		
Controls 2	No	No	Yes		
Adjustment Type	Regression	Regression	Regression	Matching	Matching
Observations	456	456	456	456	456

Note: The dependent variable is the absolute difference between the 4th guess and the number. The sample includes only underconfident participants. "Ego-relevant" indicates assignment to the ego-relevant condition (learning about own ability). Controls 1 include the relative performance of the decision-maker. Controls 2 include the initial bias of the decision-maker. In the matching estimator, observations are matched to the nearest neighbor based on the relative performance (Specification 4), and the initial bias and relative performance (Specification 5). In Specification 1-3, standard errors clustered at the individual level. In Specification 4-5, consistent standard errors as in Abadie and Imbens (2006). Their values in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$