

Table S1*Relative BIC for Each Model Tested in Experiment 1 for Each Participant*

Target Bias Swap Errors # Parameters	No Mean Shift			Mean Shift		
	None	2 nd Grating	Both	None	2 nd Grating	Both
	2	3	4	3	4	5
Participant 1	130	31	38	7	0*	6
Participant 2	215	0*	6	44	5	11
Participant 3	20	0*	6	6	5	10
Participant 4	216	0*	4	29	3	5
Participant 5	0*	5	11	5	11	17
Participant 6	0*	6	13	5	11	18
Participant 7	38	0*	5	7	0	3
Participant 8	101	56	62	5	0*	6
Participant 9	12	7	13	0*	5	11
Participant 10	177	2	8	12	0*	7
Participant 11	504	90	96	9	0*	6
Participant 12	192	26	33	9	0*	4
Participant 13	195	0	6	98	0*	6
Participant 14	39	32	39	0*	6	12
Participant 15	29	0*	6	4	3	9
Participant 16	234	72	79	16	0*	6
Participant 17	142	0*	6	30	3	9
Participant 18	76	8	7	34	4	0*
Participant 19	165	71	77	0*	2	8
Participant 20	331	8	14	24	0*	6
Participant 21	53	10	16	14	0*	6
Participant 22	273	27	33	26	0*	6
Participant 23	50	39	45	0*	5	11
Participant 24	108	0*	6	28	6	13
Participant 25	11	0*	6	8	6	13
Participant 26	58	25	32	0*	3	9
Participant 27	39	9	15	8	0*	6
Participant 28	1	0*	6	4	6	13

Notes. # Parameters – number of free parameters in the model; Relative BIC – difference from the lowest Bayesian Information Criterion value. The best fitting model has a relative BIC of zero, and is indicated by an asterisk (*) for each participant. We considered a relative BIC of <2 as weak evidence against the model with higher BIC, 2-6 as positive evidence, 6-10 as strong evidence, and >10 as very strong evidence (Raftery, 1995).

Table S2*Relative BIC for Each Model Tested in Experiment 2 for Each Participant*

Target Bias Swap Errors # Parameters	No Mean Shift			Mean Shift		
	None	2 nd Grating	Both	None	2 nd Grating	Both
	2	3	4	3	4	5
Participant 1	181	0*	7	35	5	12
Participant 2	117	6	13	2	0*	6
Participant 3	30	0*	7	10	7	13
Participant 4	148	14	21	4	0*	7
Participant 5	15	22	0*	20	8	6
Participant 6	20	2	9	0*	6	13
Participant 7	46	0*	7	15	7	14
Participant 8	29	0*	6	7	7	13
Participant 9	81	88	0	0*	7	7
Participant 10	119	0*	7	46	6	13
Participant 11	236	22	28	8	0*	6
Participant 12	125	39	46	5	0*	7
Participant 13	332	17	22	0*	3	8
Participant 14	235	28	35	0*	4	11
Participant 15	1099	0*	6	77	11	17
Participant 16	404	24	29	7	0*	2
Participant 17	214	0*	7	11	11	8
Participant 18	194	0*	7	22	6	13
Participant 19	415	0*	4	44	7	24
Participant 20	174	32	39	1	0*	7
Participant 21	308	29	35	22	0*	6
Participant 22	184	2	9	0	0*	7
Participant 23	278	1	8	11	0*	8
Participant 24	300	21	28	59	0*	6
Participant 25	600	8	15	42	0*	7
Participant 26	312	31	38	3	0*	7
Participant 27	978	285	292	0*	24	29
Participant 28	459	0*	7	17	2	8
Participant 29	145	0*	7	4	6	13
Participant 30	282	0*	7	14	1	8
Participant 31	686	0*	6	5	17	14
Participant 32	895	97	104	15	0*	7
Participant 33	443	79	86	7	0*	7
Participant 34	113	31	36	2	0*	4

Notes. Conventions as in Supplementary Table 1.