

Table S3

ID	12°			11°			10°			9°			8°			7°		
	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO
1	ZTW	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
2	ZTW	no	yes	ZTW	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
3	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
4	ZTW	yes	yes	ZTW	no	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
5	ZTW	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
6	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
7	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
8	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
9	ZTW	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
10	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
11	ZTW	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
12	ZTW	no	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
13	ZTW	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
14	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
15	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
16	ZTW	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
17	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
18	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes
19	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
20	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes
21	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
22	ZTW	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
23	ZTW	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
24	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
25	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
26	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
27	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
28	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
29	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
30	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
31	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
32	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
33	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes
34	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
35	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
36	IDS	yes	yes	ZTW	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
37	IDS	no	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes
38	IDS	yes	yes	ZTW	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
39	IDS	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
40	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
41	IDS	no	yes	ZTW	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
42	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
43	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
44	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
45	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
46	IDS	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes
47	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
48	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
49	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
50	IDS	no	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
51	IDS	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
52	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
53	IDS	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
54	IDS	yes	yes	ZTW	no	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
55	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
56	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
57	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
58	ZTW	yes	yes	ZTW	yes	yes	ZTW	no	yes	IDS	no	no	ZTW	–	–	IDS	–	–
59	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
60	ZTW	yes	yes	ZTW	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	no	IDS	–	–
61	ZTW	yes	yes	ZTW	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes

Obs. = observer; RS = response to stimulus; MO = maintenance of orientation; “–” = the fish previously failed to maintain orientation and was removed from the experiment (presumed mortality)—we treated these values as “no” for analysis.

Table S2 continued

ID	6°			5°			4°			3°			2°			1.5°		
	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO	Obs.	RS	MO
1	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
2	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
3	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes
4	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
5	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	no	IDS	–	–
6	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	no	IDS	–	–
7	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
8	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
9	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
10	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
11	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
12	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
13	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	no	IDS	–	–
14	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
15	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
16	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
17	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	yes	yes
18	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
19	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
20	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes
21	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
22	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
23	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes
24	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes
25	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
26	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
27	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
28	ZTW	yes	yes	IDS	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
29	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
30	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
31	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
32	ZTW	yes	yes	IDS	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
33	ZTW	yes	yes	IDS	no	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes
34	ZTW	no	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes
35	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes
36	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes
37	ZTW	yes	yes	IDS	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes
38	ZTW	no	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
39	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	no	IDS	–	–	ZTW	–	–
40	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	no
41	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes
42	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes
43	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes
44	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes
45	ZTW	no	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
46	ZTW	no	yes	IDS	yes	yes	IDS	yes	yes	ZTW	no	no	IDS	–	–	ZTW	–	–
47	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
48	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	no	yes	ZTW	yes	yes
49	ZTW	no	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes
50	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes
51	ZTW	no	yes	IDS	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes
52	ZTW	yes	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	yes	yes
53	ZTW	yes	yes	IDS	yes	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	yes	yes
54	ZTW	no	yes	IDS	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	no	ZTW	–	–
55	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
56	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes
57	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
58	ZTW	–	–	IDS	–	–	ZTW	–	–	IDS	–	–	ZTW	–	–	IDS	–	–
59	ZTW	no	yes	IDS	yes	yes	ZTW	yes	yes	IDS	yes	yes	ZTW	no	yes	IDS	no	yes
60	ZTW	–	–	IDS	–	–	ZTW	–	–	IDS	–	–	ZTW	–	–	IDS	–	–
61	ZTW	yes	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes	ZTW	no	yes	IDS	no	yes

Obs. = observer; RS = response to stimulus; MO = maintenance of orientation; “–” = the fish previously failed to maintain orientation and was removed from the experiment (presumed mortality)—we treated these values as “no” for analysis.