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## Supplementary Materials for

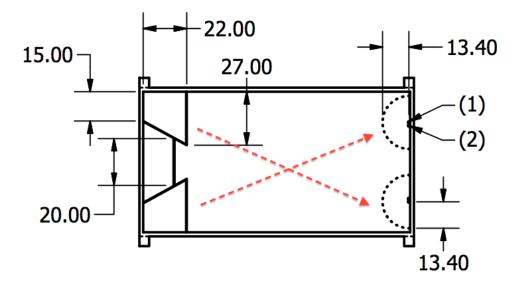
## Consensus and experience trump leadership, suppressing individual personality during social foraging

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Published 14 September 2016, *Sci. Adv.* **2**, e1600892 (2016) DOI: 10.1126/sciadv.1600892

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**fig. S1. Overhead view of experimental apparatus.** All measurements are in cm. Arena walls are indicated by the double solid lines, with single solid lines within the arena representing opaque walls; the two groups tested concurrently were not in visual contact with one another. (1) indicates the pipette with the standardized red stimulus, and (2) indicates the pipette through which the bloodworms are ejected. The dotted circular lines illustrate the radius fish had to cross before the bloodworms were ejected. The red dashed arrows illustrate the direction of the standardized stimulus from the starting pens.

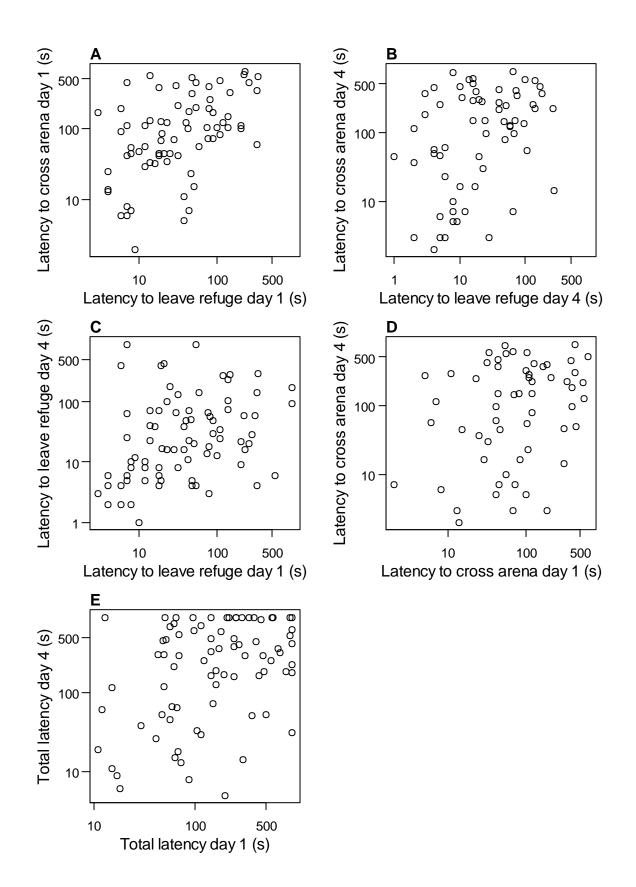
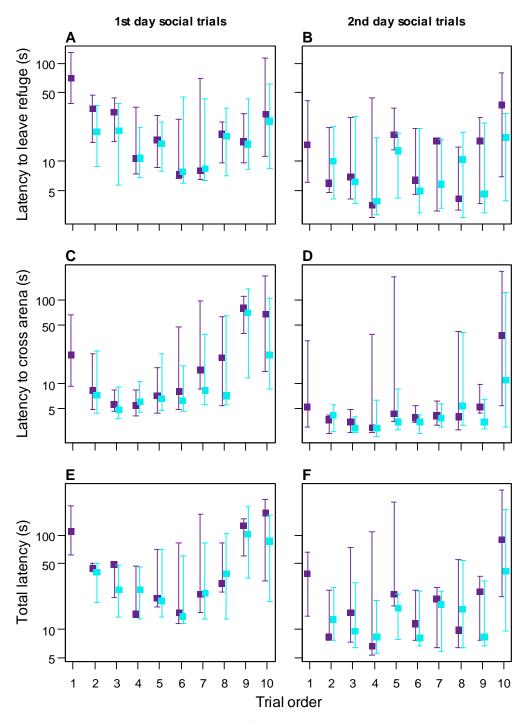
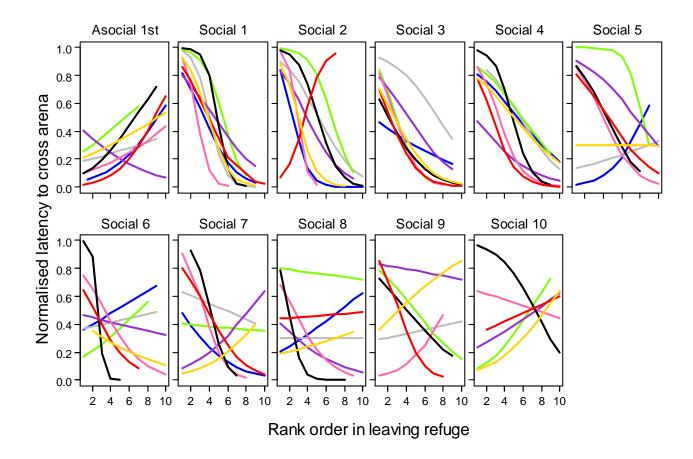


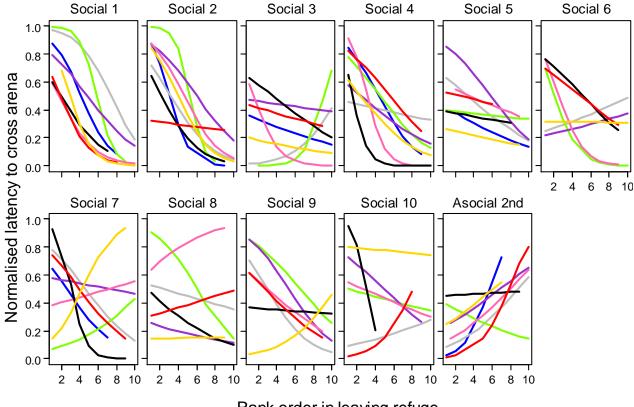
fig. S2. Repeatability within and between behaviors when fish were tested alone (that is, in an asocial setting). (A) The correlation between the latency to first leave the refuge and cross the arena on the first day of asocial trials (Spearman's rank correlation:  $r_s = 0.49$ , N = 74, P =  $1.15 \times 10^{-5}$ ), and (B) the second ( $r_s = 0.35$ , N = 64, P = 0.0048). (C) The correlation between the first and second days of asocial trials in the latency to first leave the refuge ( $r_s = 0.37$ , N = 80, P = 0.00081), and (D) in the latency to first cross the arena ( $r_s = 0.27$ , N = 59, P = 0.036). (E) The correlation between the total latency to leave refuge and cross the arena between the first and second days of asocial trials ( $r_s = 0.31$ , N = 80, P = 0.0045). Both axes are on a log10 scale.



**fig. S3. Effect of trial order and whether a fish fed in the previous trial on the latency to leave the refuge or cross the arena.** Data from individuals that fed in the previous trial are represented in cyan, and those that did not in purple. Note for the first trial on each day, no fish could have fed in the previous trial. (A) The latency to first leave the refuge on the first day of group testing and (B) the second day. (C,D) The same comparisons for the latency to cross the arena, and (E,F) the total time taken (the total of the two latencies). In all cases there is a significant main effect of whether a fish fed in a previous trial (Table S1). Shown are medians and interquartile ranges. The latencies are plotted on a log10 scale.



**fig. S4. Collective decisions to cross the arena and its change over repeated trials on the first day of group trials.** Shown is the relationship between the rank order of the fish in their latency to first leave the refuge and their latency to then cross the arena (normalised within that trial) for each trial order. Logistic regressions are fitted for each trial separately. Line colours depict each of the 8 groups of fish, as in Figure 4. Also shown are the model fits for the same analysis for each group applied to the latencies when fish were tested alone on the first day, before the group testing (Asocial 1st), which demonstrates the expected relationship if there were no social interactions between fish.



Rank order in leaving refuge

**fig. S5. Collective decisions to cross the arena and its change over repeated trials on the second day of group trials.** Plotting is as in Figure S4. Also shown are the model fits for the same analysis for each group applied to the latencies when fish were tested alone on the final day, after the group testing (Asocial 2nd).

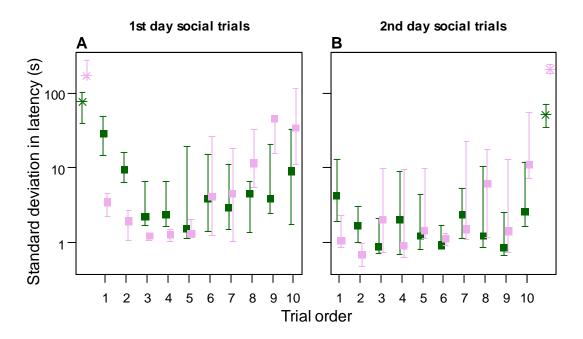


fig. S6. SD of latencies to leave the refuge (dark green) and the total time taken to reach the food (pink) within each trial as the group trials progressed each day. (A) The effect of trial order within the first day of group trials and (B) second day of group trials. Shown are medians (squares) and interquartile ranges. On both days, there was a significant interaction between the type of latency and the order of the trial (negative binomial GLMMs: trial order × leaving refuge or reaching the food, first day: deviance<sub>6,7</sub> = 16.01, P =  $6.30 \times 10^{-5}$ ; second day: deviance<sub>6,7</sub> = 8.62, P = 0.0033). Also shown are the standard deviations between fish in each group in leaving the refuge (dark green) and reaching the food (pink) when fish were tested alone before (in A) and after (in B) group trials (their medians are indicated by asterisks rather than squares). The standard deviations are plotted on a log10 scale.

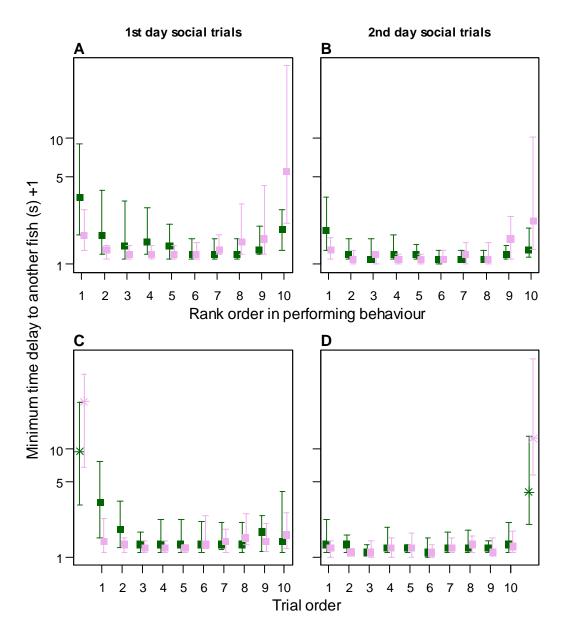


fig. S7. The minimum time delay from each fish to another fish in the trial to first leave the refuge (dark green) and reach the food (pink). (A) The effect of the rank order in performing each behaviour (whether leaving the refuge or reaching the food) on the first day of social trials, and the second (B). There is a significant interaction between rank order and type of latency on both days (negative binomial GLMM: rank order in trial × leaving refuge or reaching the food, first day: deviance<sub>10,11</sub> = 26.58, P =  $2.53 \times 10^{-7}$ ; second day: deviance<sub>10,11</sub> = 19.32, P =  $1.11 \times 10^{-5}$ ). (C) The effect of trial order on the first day of social trials, and the second (D). There is only a significant interaction on the first day of group trials (negative binomial GLMM: trial order × leaving refuge or reaching the food, first day: deviance<sub>10,11</sub> = 18.48, P =  $1.72 \times 10^{-5}$ ; second day: deviance<sub>10,11</sub> = 1.98, P = 0.16). Shown are medians and interquartile ranges. Also shown are the time delays between fish in each group in leaving the refuge (dark green) and reaching the food (pink) when fish were tested alone before (in C) and after (in D) group trials (their medians are indicated by asterisks rather than squares). The time delays are plotted on a log10 scale.

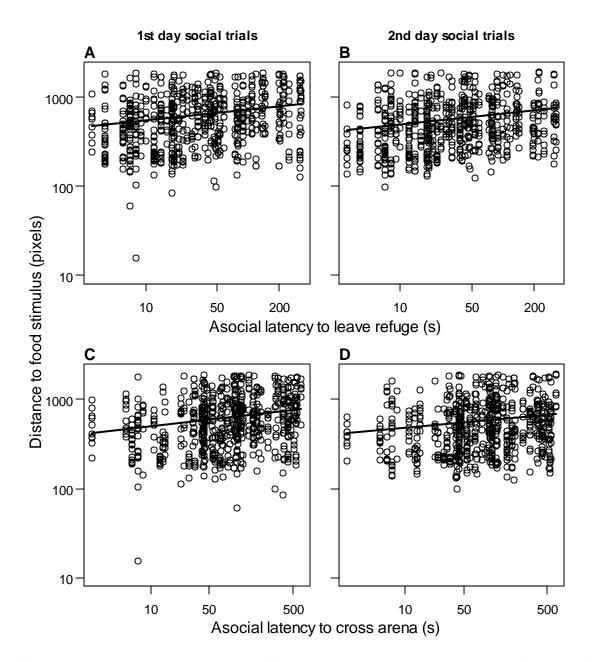


fig. S8. Relationship between latencies of fish tested alone and their distances from the food stimulus in each group trial when the first fish reaches the food. (A,B) The relationship on the first (A) and second (B) days of group trials for the latency to leave the refuge, and (C,D) for the latency to cross the arena on first (C) and second (D) days of group trials. Black lines show the fitted relationship from the GLMMs. The effect of boldness is statistically significant in all cases: latency to leave refuge when tested alone as measure of boldness: first day of group trials: deviance<sub>9,10</sub> = 15.72, P =  $7.34 \times 10^{-5}$ ; second day: deviance<sub>9,10</sub> = 15.72, P =  $7.344 \times 10^{-5}$ ; second day: deviance<sub>9,10</sub> = 15.72, P =  $7.344 \times 10^{-5}$ ; second day: deviance<sub>9,10</sub> = 7.24, P = 0.00713. Both asocial latencies and distances are plotted on a log10 scale.

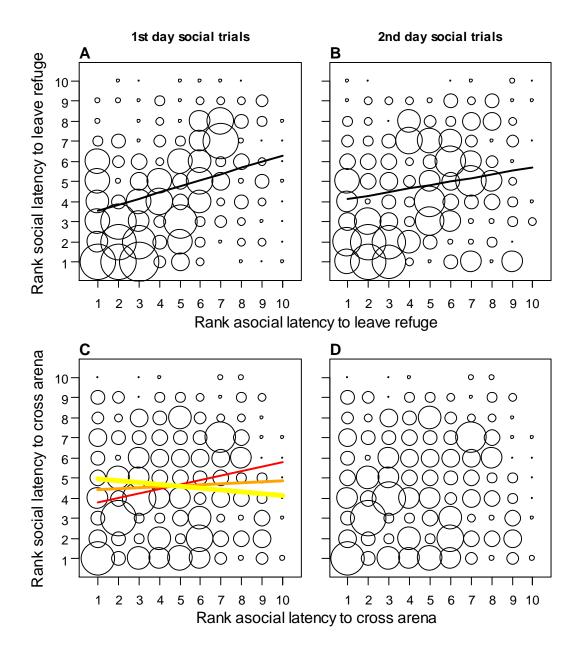


fig. S9. Relationship between the rank order in each group of latencies of fish tested alone (asocial) and in groups (social) for all group trials. Rank social latencies are plotted against corresponding rank asocial latencies for leaving the refuge (A, B) and crossing the arena (C, D), on the first (A, C) or second day (B, D) of the social trials. The circle diameter is proportional to the number of instances, with the largest being 19 cases (at (3,1) in panel A). The trendlines in A, B are fitted from the GLMMs showing significant main effects of the rank asocial latency to leave the refuge (LMM: first day: deviance<sub>8,9</sub> = 23.48, P =  $1.262 \times 10^{-6}$ , second day: deviance<sub>8,9</sub> = 7.94, P = 0.0048). In C, they demonstrate the interaction between the rank asocial latency to leave the refuge and trial order (deviance<sub>9,10</sub> = 6.52, P = 0.010), with the line thickness and colour representing the trial number (with the first being the thick yellow line, fifth the thinner orange line and the tenth the thin red line). Only these trendlines are shown for clarity (note the trendlines for the other orders are intermediate between these as trial order is a continuous variable). There was not any significant association between the rank asocial and social latencies in **D**, thus trendlines are omitted.

**table S1. Summaries of the statistical models.** Shown are coefficient estimates, their standard errors, their Z score, and the corresponding P value. (A) Shows the results for analyses of the latencies when tested alone and the first trial of each group testing day. In (B), (F) and (G) the sample sizes are the same within each day as cases where fish did not cross the arena were also removed from the corresponding analysis of their latency to leave the refuge for that day. In all models the group is a random effect, and fish ID is also included when there are repeated measures for each fish (all models except C and D). All statistically significant (at P<0.05) terms are in bold.

Test and response variable	Explanatory variables	Estimate	S.E.	z value	P value
A: Effect of b	oehaviour (leaving refuge/crossing arena), sociality	(alone/group) a	nd day (fi	rst/second)	on latencies
Neg. bin.	Behaviour x Sociality x Day	-2636	0.3722	-0.71	0.47882
GLMM	Sociality x Day	-0.9947	0.2765	-3.6	0.00032
Latencies	Behaviour x Day	-0.6231	0.2668	-2.34	0.01951
n = 602	Behaviour x Sociality	1.4388	0.2591	5.55	2.8×10 <sup>-8</sup>
	Standard body length	-0.0442	0.0377	-1.17	0.24194
	Side of the pen	0.3043	0.337	0.9	0.3666
	Day	0.5022	0.1933	2.6	0.00939
	Sociality	-1.2938	0.1956	-6.61	3.8×10 <sup>-11</sup>
	Behaviour	6.8183	1.6777	4.06	0.00087

B: Effect	of asocial latencies (i.e. boldness), trial order and whe	ther a fish fe	d on latenci	es in grou	p trials
Neg. bin.	Trial order x log10 Asocial latency to leave refuge	-1.2052	0.4736	-2.54	0.01
GLMM	Linear effect of trial order	1.1381	1.7677	0.64	0.52
Social latency	Quadratic effect of trial order	9.9194	0.6147	14.96	<2×10 <sup>-1</sup>
to leave	log10 Asocial latency to leave refuge	0.0546	0.023	2.37	0.018
efuge (day 2)	Whether fed in previous trial	-0.2753	0.0561	-4.91	9.1×10 <sup>-</sup>
n = 609	Standard body length	r1.13811.7677 $0.64$ $0.5$ rder9.9194 $0.6147$ $14.96$ $<2\times10^{-3}$ eave refuge $0.0546$ $0.023$ $2.37$ $0.01$ rial $-0.2753$ $0.0561$ $4.91$ $9.1\times10$ $0.0178$ $0.0194$ $0.91$ $0.36$ $0.8079$ $0.5088$ $1.59$ $0.111$ al latency to leave refuge $-0.10202$ $0.48053$ $-0.21$ $0.8079$ $0.5088$ $1.59$ $0.111$ al latency to leave refuge $0.02462$ $0.02256$ $1.09$ $0.775$ $7.1781$ $1.65$ $0.099$ rder $5.2582$ $0.61407$ $8.56$ $<2\times10^{-1}$ $0.02462$ $0.02256$ $1.09$ $0.00185$ $0.0181$ $0.1$ $0.918$ $0.00185$ $0.0181$ $0.1$ $0.918$ $1.18092$ $0.6768$ $1.74$ $0.08$ al latency to cross arena $-0.1145$ $0.8131$ $-0.14$ $0.8779$ $3.7248$ $3.42$ $0.0006$ rder $12.2315$ $1.1647$ $10.5$ $<2\times10^{-3}$ $0.2216$ $0.0986$ $-3.26$ $0.0011$ $-0.0668$ $0.0396$ $-1.69$ $0.0912$ $0.4656$ $0.493$ $0.94$ $0.3449$ al latency to cross arena $0.77271$ $0.81122$ $0.95$ $0.3716$ $0.25$ $0.80$ rial $-0.2329$ $0.1006$ $-2.32$ $0.02$ $0.00921$ $0.03716$ $0.25$ $0.80$ rial $-0$			
	Side of the pen	0.8079	0.5088	1.59	0.112
Neg. bin.	Trial order x log10 Asocial latency to leave refuge	-0.10202	0.48053	-0.21	0.8319
GLMM	Linear effect of trial order	2.92734	1.7781	1.65	0.099
Social latency	Quadratic effect of trial order	5.2582	0.61407	8.56	<2×10 <sup>-1</sup>
to leave	log10 Asocial latency to leave refuge	0.02462	0.02256	1.09	0.2752
efuge (day 3)	Whether fed in previous trial	-0.16869	0.05646	-2.99	0.0028
n = 625	Standard body length	0.00185	0.0181	0.1	0.918
	Side of the pen	1.18092	0.6768	1.74	0.081
Neg. bin.	Trial order x log10 Asocial latency to cross arena	-0.1145	0.8131	-0.14	0.88797
GLMM	Linear effect of trial order	12.7379	3.7248	3.42	0.0006.
Social latency	Quadratic effect of trial order	12.2315	1.1647	10.5	<2×10 <sup>-1</sup>
Social latency to cross arena	log10 Asocial latency to cross arena	0.0706	0.0422	1.67	0.094
(day 2)	Whether fed in previous trial	-0.3216	12.2315 1.1647 10.5 <2	0.0011	
n = 609	Standard body length	-0.0668	0.0396	-1.69	0.09122
	Side of the pen	0.4656	0.493	0.94	0.34492
Neg. bin.	Trial order x log10 Asocial latency to cross arena	0.77271	0.81122	0.95	0.09122 0.34492 0.341 <b>0.029</b>
GLMM	Linear effect of trial order	8.11726	3.7186	2.18	0.029
ocial latency	Quadratic effect of trial order	11.38264	1.0996	10.35	<2×10 <sup>-1</sup>
o cross arena	log10 Asocial latency to cross arena	0.00921	0.03716	0.25	0.804
(day 3)	Whether fed in previous trial	-0.2329	0.1006	-2.32	0.02
n = 625	Standard body length	-0.00398	0.0319	-0.12	0.901
	Side of the pen	1.56607	0.94022	1.67	0.096
Neg. bin.	Trial order x log10 Asocial total time taken	-0.00475	0.00761	-0.62	0.53
GLMM	Linear effect of trial order				
Social total	Quadratic effect of trial order				
time taken	log10 Asocial latency to leave refuge and cross arena				
(day 2)	Whether fed in previous trial	-0.26912			
n = 609	Standard body length				
	Side of the pen				
Neg. bin.	Trial order x log10 Asocial total time taken				
GLMM	Linear effect of trial order	8.77798	2.9867	2.94	0.15 <2×10 <sup>-16</sup> 0.23 2.1×10 <sup>-6</sup> 0.92 0.34
Social tatal	Quadratic effect of trial order	3.34108	0.77554	4.31	1.6×10 <sup>-</sup>
Social total time taken	Log10 Asocial latency to leave refuge and cross	0.04986	0.04952	1.01	0.3139
(day 3) n = 625	arena Whether fed in previous trial	-0.15602	0.06496	-2.4	0.0163

Standard body length	-0.01201	0.01972	-0.61	0.5425
Side of the pen	0.99848	0.49321	2.02	0.0429

C: Effects	C: Effects on the deviance of the logistic regression fit between normalised time taken and rank in group								
Poisson	Trial order	0.1424	0.027	5.28	1.3×10 <sup>-7</sup>				
GLMM	Side of the pen	-0.0871	0.2727	-0.32	0.75				
Link-logit deviance (day 2) n = 77									
Poisson	Trial order	0.0658	0.222	2.96	0.003				
GLMM	Side of the pen	-0.0976	0.127	-0.77	0.442				
Link-logit deviance (day 3) n = 76									

D: Effect of behaviour (leaving refuge/crossing arena) and trial order on the S.D. of latencies in a group								
Behaviour x Trial order	0.2381	0.0584	4.08	4.6×10 <sup>-5</sup>				
Behaviour	-1.3142	0.3551	-3.7	0.00022				
Trial order	-0.033	0.0416	-0.79	0.42679				
Side of the pen	0.243	0.2458	0.99	0.3227				
Behaviour x Trial order	0.1549	0.0521	2.98	0.00292				
Behaviour	-0.6242	0.3214	-1.94	0.05211				
Trial order	0.0303	0.0386	0.78	0.43317				
Side of the pen	0.8017	0.4812	1.67	0.09573				
	Behaviour x Trial order Behaviour Trial order Side of the pen Behaviour x Trial order Behaviour Trial order	Behaviour x Trial order0.2381Behaviour-1.3142Trial order-0.033Side of the pen0.243Behaviour x Trial order0.1549Behaviour-0.6242Trial order0.0303	Behaviour x Trial order 0.2381 0.0584   Behaviour -1.3142 0.3551   Trial order -0.033 0.0416   Side of the pen 0.243 0.2458   Behaviour x Trial order 0.1549 0.0521   Behaviour -0.6242 0.3214   Trial order 0.0303 0.0386	Behaviour x Trial order 0.2381 0.0584 4.08   Behaviour -1.3142 0.3551 -3.7   Trial order -0.033 0.0416 -0.79   Side of the pen 0.243 0.2458 0.99   Behaviour x Trial order 0.1549 0.0521 2.98   Behaviour -0.6242 0.3214 -1.94   Trial order 0.0303 0.0386 0.78				

E: Effect o	f leaving refuge or crossing arena, trial ord	er and rank on minim	um time de	lay to ano	ther fish
Neg. bin.	Trial order x Behaviour	0.0978	0.0227	4.3	1.7×10 <sup>-5</sup>
GLMM	Behaviour x Rank	0.1275	0.0247	5.16	2.5×10 <sup>-7</sup>
Time delay	Trial order	-0.042	0.0156	-2.7	0.00691
between fish	Behaviour	-1.3529	0.1905	-7.1	1.2×10 <sup>-12</sup>
(day 2)	Rank	-0.0515	0.0151	-3.41	0.00065
n = 1433	Standard body length	-0.0192	0.0177	-1.08	0.27948
	Side of the pen	-0.0894	0.1295	-0.69	0.49035
Neg. bin.	Trial order x Behaviour	0.03257	0.02309	1.41	0.1583
GLMM	Behaviour x Rank	0.11094	0.02521	4.4	1.1×10 <sup>-5</sup>
Time delay	Trial order	0.00682	0.01614	0.42	0.6727
between fish	Behaviour	-0.83171	0.01972	-4.22	2.5×10 <sup>-5</sup>
(day 3)			3		
n = 1446	Rank	-0.02766	0.01611	-1.72	0.086
	Standard body length	-0.05523	0.02209	-2.5	0.0124
	Side of the pen	-0.36206	0.1215	-2.98	0.0029

F: Relation	onship between distance to stimulus in group trials a	nd latencies i	n asocial tı	rials (i.e. bol	dness)
Neg. bin.	Trial order x log10 Asocial latency to leave refuge	0.3792	0.436	0.87	0.38441
GLMM	log10 Asocial latency to leave refuge	0.1207	0.03	4.03	5.7×10 <sup>-5</sup>
Distance to	Linear effect of trial order	-5.7668	1.5844	-3.64	0.00027
the stimulus	Quadratic effect of trial order	0.5094	0.5531	0.92	0.35706
(day 2)	Whether fed in previous trial	-0.1941	0.0498	-3.89	9.8×10 <sup>-5</sup>
n = 658	Side of the pen	-0.0886	0.0741	-1.2	0.23187
	Standard body length	0.0339	0.0125	2.71	0.00664
Neg. bin.	Trial order x log10 Asocial latency to leave refuge	-0.17203	0.44159	-0.39	0.69686
GLMM	log10 Asocial latency to leave refuge	0.12441	0.03244	3.84	0.00013
Distance to	Linear effect of trial order	-1.67423	1.6275	-1.03	0.30362
the stimulus	Quadratic effect of trial order	0.23176	0.55306	0.42	0.67518
(day 3)	Whether fed in previous trial	-0.06867	0.05279	-1.3	0.19332
n = 652	Side of the pen	-0.00979	0.12429	-0.08	0.93724
	Standard body length	0.00135	0.01893	0.07	0.94326
Neg. bin.	Trial order x log10 Asocial latency to cross arena	-0.55	0.3728	-1.48	0.1401
GLMM	log10 Asocial latency to cross arena	0.0948	0.0235	4.03	5.6×10 <sup>-5</sup>
Distance to	Linear effect of trial order	-1.3363	1.7367	-0.77	0.4416
the stimulus	Quadratic effect of trial order	0.6984	0.4852	1.44	0.15
(day 2)	Whether fed in previous trial	-0.1951	0.0434	-4.5	6.9×10 <sup>-6</sup>
n = 658	Side of the pen	-0.072	0.0612	-1.18	0.2392
	Standard body length	0.0332	0.0106	3.14	0.0017
Neg. bin.	Trial order x log10 Asocial latency to cross arena	-0.69475	0.40332	-1.72	0.085
GLMM	log10 Asocial latency to cross arena	0.06626	0.02801	2.37	0.018
Distance to	Linear effect of trial order	1.13949	1.8641	0.61	0.541
the stimulus	Quadratic effect of trial order	-0.01798	0.52895	-0.03	0.973
(day 3)	Whether fed in previous trial	-0.0744	0.04918	-1.51	0.13
n = 652	Side of the pen	-0.0378	0.10031	-0.37	0.708
	Standard body length	0.00337	0.0162	0.21	0.835

G: Effe	ect of rank asocial latency, trial order and whether	a fish fed on ra	nk latency i	in group (	rials
LMM	Trial order x Rank asocial latency to leave refuge	0.0077	0.01229	0.63	0.5309
Rank social latency to leave refuge	Whether fed in previous trial x Trial order	-0.00169	0.0639	-0.03	0.9789
	Rank asocial latency to leave refuge	0.30617	0.06152	4.98	6.50×10 <sup>-7</sup>
	Trial order	0.00798	0.03102	0.26	0.797
(day 2)	Whether fed in previous trial	-0.32232	0.19363	-1.66	0.096
n = 609	Side of the pen	-0.1176	0.32224	-0.36	0.715
	Standard body length	0.09308	0.05631	1.65	0.098
LMM	Trial order x Rank asocial latency to leave refuge	-0.00689	0.01239	-0.56	0.578
Deals see is 1	Whether fed in previous trial x Trial order	-0.03687	0.06675	-0.55	0.581
Rank social latency to	Rank asocial latency to leave refuge	0.175	0.0617	2.84	0.0045
leave refuge	Trial order	-0.0375	0.0321	-1.17	0.2432
(day 3)	Whether fed in previous trial	-0.1244	0.2115	-0.59	0.5564
n = 625	Side of the pen	-0.2115	0.3181	-0.66	0.5062
	Standard body length	0.1116	0.0556	2.01	0.0445
LMM	Trial order x Rank asocial latency to leave refuge	0.0346	0.0135	2.56	0.01
Deals see is 1	Whether fed in previous trial x Trial order	-0.10498	0.07031	-1.49	0.135
Rank social latency to	Rank asocial latency to leave refuge	-0.1266	0.0898	-1.41	0.159
cross arena	Trial order	-0.162	0.0713	-2.27	0.023
(day 2)	Whether fed in previous trial	-0.2042	0.2093	-0.98	0.329
n = 609	Side of the pen	-0.0541	0.2804	-0.19	0.847
	Standard body length	0.1173	0.049	2.39	0.017
LMM	Trial order x Rank asocial latency to leave refuge	0.00933	0.01293	0.72	0.47
Deals see is 1	Whether fed in previous trial x Trial order	-0.07593	0.06969	-1.09	0.28
Rank social latency to	Rank asocial latency to leave refuge	0.0277	0.0572	0.48	0.628
cross arena	Trial order	-0.0414	0.034	-1.22	0.224
(day 3)	Whether fed in previous trial	-0.2663	0.2187	-1.22	0.223
n = 625	Side of the pen	-0.295	0.2917	-1.01	0.312
	Standard body length	0.0846	0.0509	1.66	0.096

Binomial	Trial order x log10 Asocial latency to leave refuge	-0.0076	0.0265	-0.29	0.77
GLMM	log10 Asocial latency to leave refuge	-0.3273	0.1269	-2.58	0.0099
Whether fed in trial	Linear effect of trial order	2.6014	2.3603	1.1	0.2704
	Quadratic effect of trial order	-0.5541	2.3586	-0.23	0.8143
(day 2)	Side of the pen	-0.1786	0.3085	-0.58	0.5625
n = 711	Standard body length	-0.0304	0.0535	-0.57	0.5694
Binomial	Trial order x log10 Asocial latency to leave refuge	0.000724	0.029474	0.02	0.98
GLMM	log10 Asocial latency to leave refuge	-0.5098	0.1512	-3.37	0.00075
Whether fed	Linear effect of trial order	-1.6284	2.6143	-0.62	0.53336
in trial	Quadratic effect of trial order	0.7985	2.5742	0.31	0.75642
(day 3)	Side of the pen	-0.3574	0.3603	-0.99	0.32122
n = 700	Standard body length	-0.0111	0.0625	-0.18	0.85925
Binomial	Trial order x log10 Asocial latency to cross arena	-0.00081	0.024974	-0.03	0.97
GLMM	log10 Asocial latency to cross arena	-0.2933	0.12	-2.44	0.015
Whether fed	Linear effect of trial order	2.5545	2.3594	1.08	0.279
in trial	Quadratic effect of trial order	-0.6077	2.3582	-0.26	0.797
(day 2)	Side of the pen	-0.2033	0.3101	-0.66	0.512
n = 711	Standard body length	-0.0327	0.0538	-0.61	0.543
Binomial	Trial order x log10 Asocial latency to cross arena	0.0446	0.0286	1.56	0.1192
GLMM	log10 Asocial latency to cross arena	-0.4034	0.146	-2.76	0.0057
Whether fed	Linear effect of trial order	-1.6637	2.6149	-0.64	0.5246
in trial	Quadratic effect of trial order	0.7913	2.5748	0.31	0.7586
(day 3)	Side of the pen	-0.4024	0.3699	-1.09	0.2766
n = 700	Standard body length	-0.0135	0.0641	-0.21	0.8326

Day	Group	Order	N leaving the refuge	N crossing arena	N consuming food
2	1	1	10	10	7
2	1	2	10	8	7
2	1	3	10	7	6
2	1	4	10	9	7
2	1	5	10	8	7
2	1	6	10	6	5
2	1	7	10	10	6
2	1	8	10	10	8
2	2	1	10	10	8
2	2	2	10	10	8
2	2	3	10	9	6
2	2	4	10	9	5
2	2	5	10	10	6
2	2	6	10	6	4
2	2	7	10	8	5
2	2	8	10	10	6
2	2	9	10	10	5
2	3	1	10	9	7
2	3	2	9	9	8
2	3	3	9	7	5
2	3	4	10	8	6
2	3	5	9	8	6
2	3	6	10	8	5
2	3	7	10	8	8
2	3	8	10	7	6
2	3	9	10	9	7
2	3	10	10	9	8
2	4	1	10	9	7
2	4	2	10	9	7
2	4	3	10	10	6
2	4	4	10	10	8
2	4	5	10	10	7
2	4	6	10	10	7
2	4	7	10	10	8
2	4	8	10	9	8
2	4	9	10	9	8
2	4	10	10	9	5
2	5	1	10	9	4

table S2. Frequencies of fish trial leaving the refuge, crossing the arena, and consuming bloodworm before the end of each trial. There are 10 fish in each group trial.

2	5	2	10	8	6
2	5	3	10	9	6
2	5	4	10	10	6
2	5	5	10	9	7
2	5	6	10	10	5
2	5	7	10	8	5
2	5	8	10	9	7
2	5	9	10	7	5
2	5	10	10	9	8
2	6	1	10	9	6
2	6	2	10	9	7
2	6	3	10	10	7
2	6	4	10	9	5
2	6	5	10	8	7
2	6	6	10	8	7
2	6	7	10	6	5
2	6	8	10	8	7
2	6	9	10	8	8
2	6	10	10	10	4
2	7	1	10	5	3
2	7	2	10	8	4
2	7	3	10	10	9
2	7	4	10	10	7
2	7	5	10	9	7
2	7	6	10	7	7
2	7	7	10	10	7
2	7	8	10	8	8
2	7	9	10	7	6
2	7	10	10	8	7
2	8	1	10	9	5
2	8	2	9	8	7
2	8	3	10	10	7
2	8	4	10	8	6
2	8	5	10	9	8
2	8	6	10	7	6
2	8	7	10	8	6
2	8	8	10	8	6
2	8	9	10	8	7
2	8	10	10	10	8
3	1	1	10	10	6
3	1	2	10	7	5
3	1	3	10	9	8
3	1	4	10	8	6

3	1	5	10	9	7
3	1	7	10	8	6
3	2	1	10	10	5
3	2	2	10	10	7
3	2	3	10	10	6
3	2	4	10	10	8
3	2	5	10	10	9
3	2	6	10	10	8
3	2	7	10	9	5
3	2	8	10	10	7
3	2	9	10	10	10
3	2	10	10	10	4
3	3	1	10	9	8
3	3	2	10	8	5
3	3	3	10	8	5
3	3	4	10	10	8
3	3	5	10	10	7
3	3	6	10	10	7
3	3	7	10	9	5
3	3	8	10	9	7
3	3	9	10	8	7
3	3	10	10	9	10
3	4	1	10	10	8
3	4	2	10	10	8
3	4	3	10	10	6
3	4	4	10	9	8
3	4	5	10	9	6
3	4	6	10	10	6
3	4	7	10	9	8
3	4	8	10	8	7
3	4	9	10	10	7
3	4	10	10	8	8
3	5	1	10	10	9
3	5	2	10	10	9
3	5	3	10	10	9
3	5	4	10	10	7
3	5	5	10	7	5
3	5	6	10	8	7
3	5	7	10	9	7
3	5	8	10	7	5
3	5	9	10	6	6
3	5	10	10	9	7
3	6	1	10	10	8

3	6	2	10	9	7
3	6	3	10	10	8
3	6	4	10	9	7
3	6	5	10	9	7
3	6	6	10	8	7
3	6	7	10	9	8
3	6	8	10	9	9
3	6	9	10	9	7
3	6	10	10	10	7
3	7	1	10	9	7
3	7	2	10	9	7
3	7	3	9	9	7
3	7	4	9	9	9
3	7	5	10	9	7
3	7	6	9	9	6
3	7	7	9	9	6
3	7	8	10	7	6
3	7	9	9	8	7
3	7	10	10	8	7
3	8	1	10	9	8
3	8	2	10	10	7
3	8	3	10	10	9
3	8	4	10	10	8
3	8	5	10	9	8
3	8	6	10	9	7
3	8	7	10	8	7
3	8	8	10	9	6
3	8	9	10	10	8
3	8	10	10	10	9