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Supplemental Material

Table S1. Location of study sites in Lombardy and Piedmont, North Italy. Sample size refers to the number of arena tests (total n = 323). In all sites, the density of red squirrels (highest density of different trapping periods) was estimated by MNA, and minimum density of grey squirrels (in red-grey sites) was estimated from removals.

Site-type (size, ha)	Coordinates	Sample size (M, F)	Red squirrel	Grey squirrel	N capture sessions (N traps)	
			density (ha ⁻¹)	density (ha ⁻¹)	2016	2017
Red-only						
Valfurva (76 ha)	46°27'N, 10°31'E	84 (60, 24)	0.60	n/a	2 (20)	2 (20)
Bormio (90 ha)	46°27'N, 10°30'E	41 (36, 5)	0.24	n/a	2 (20)	2 (20)
Cancano (54 ha)	46°33'N, 10°15'E	31 (20, 11)	0.13	n/a	2 (18)	2 (18)
Red-grey						
Vanzago (74 ha)	45°31'N, 8°58'E	45 (27, 18)	0.28	0.24	3 (27)	4 (28)
Castelbarco (55 ha)	45°35'N, 9°31'E	88 (53, 35)	0.30	0.67	4 (39)	6 (41)
Passatempo (18 ha)	45°00'N, 7°78'E	34 (18, 16)	0.38	0.98	3 (21)	4 (20)

Supplemental material 2. Arena test details.

Immediately after handling, we released a marked squirrel in the arena by opening a sliding door (28 × 15 cm, internal opening 12 × 12 cm) and allowing the animal to move from the handling bag into the arena. The arena is a white extruded polycarbonate box of 50 × 51 × 51 cm; the floor of the arena consists of a panel with four blind holes (7 cm diameter × 4 cm deep), that allow to differentiate between exploration and activity behaviours (hole board test, ^{41,43}). The wall at the opposite site of the entrance has a sliding panel that can be removed to reveal a mirror (24 × 51 cm). In the lid of the arena (inside a 5 cm diameter hole) we fit a web camera (Drift, Professional HD Action Camera, model: FD9960, Ghost S) to record the animal's behaviour. To quantify individual personality, we performed two different experiments inside the arena: Open Field Test (OFT) to estimate activity and exploration levels in a novel environment and Mirror Image Stimulation (MIS) to test aggressiveness, sociability or

avoidance towards conspecifics ^{28,42}. The two tests were performed in the same testing session, with the OFT also serving as habituation time before the MIS. The arena was placed on the ground near the trap where the squirrel was caught and recording (OFT experiment) started before we released the animal inside the arena. After 4 min we opened the mirror and began MIS test for another 3 min ⁴¹. At the end of MIS the squirrel was released by opening the sliding door. After each experiment the arena was cleaned with 90% ethyl alcohol to eliminate urine and faecal pellets when present and to eliminate effects of squirrel's scent on behaviour of the next animal.

Table S3. MCMCglmm outputs of the full model (for detailed description see Statistical Analysis). All expert-based personality traits, survival and reproduction were treated as dependent variables after standardisation. For all expert-based personality traits, a Gaussian residual error distribution was used, while survival and reproduction were treated as binomial. Assumption of multivariate normality of the personality traits was supported by the QQ-plot of the Mahalanobis distances of the model residuals (r-squared value = 0.92). For both the residual and between-individual variation, an unstructured variance-covariance matrix was modelled, allowing the estimation of correlations among the response variables (covariance divided by the square root of the product of the variances). Area-type, red-only vs red-grey, was treated as fixed effect, and area nested within area-type was added as random effect (as a heterogeneous identity matrix) to avoid pseudoreplication problems during the parameter estimation process. In addition, sex, body mass, year and arena test order (first to fourth test of the same animal) were added as fixed effects. The effect of sex was set to zero for the dependent variable reproduction and the effect of arena test order was set to zero for both reproduction and survival. Posterior distributions were based on 10000000 iterations with a burnin of 50000 iterations and thinning of 100, such that 100000 iterations were used to obtain point estimates and 95% credibility intervals. For all fixed effects, the prior distribution was Gaussian with zero mean and variance equal to 1. For the random effects and residual variation and inverse Wishard prior was set with diagonal elements equal to 0.5, 0.5 and 0.1 for the residual, between-individual and nested area effect respectively. The believe parameter was set to 0.01.

Model output

DIC: 2975.358

G-structure: ~us(trait):IDf (Among individual variance – covariance estimates)

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.IDf	5.120e-01	3.165e-01	7.084e-01	20318.712
traitexp:traitshy.IDf	-1.603e-01	-2.899e-01	-3.648e-02	11947.318
traitact:traitshy.IDf	-4.656e-01	-6.478e-01	-2.910e-01	21410.384
traitsoc:traitshy.IDf	-6.582e-02	-1.901e-01	6.097e-02	13014.822
traitavo:traitshy.IDf	1.691e-01	3.877e-02	3.034e-01	13501.102
traitale:traitshy.IDf	-8.327e-02	-1.988e-01	3.150e-02	16747.175
traitoth:traitshy.IDf	-3.688e-01	-5.302e-01	-2.146e-01	16575.455
traitSURVf.2:traitshy.IDf	1.712e+00	-1.377e+01	1.825e+01	439.269
traitREPROdf.2:traitshy.IDf	-1.238e+01	-3.035e+01	1.825e+00	22.645
traitshy:traitexp.IDf	-1.603e-01	-2.899e-01	-3.648e-02	11947.318
traitexp:traitexp.IDf	9.551e-02	2.023e-02	1.827e-01	3032.369
traitact:traitexp.IDf	1.394e-01	2.863e-02	2.550e-01	16024.791
traitsoc:traitexp.IDf	4.050e-02	-3.210e-02	1.151e-01	1837.460
traitavo:traitexp.IDf	-6.515e-02	-1.444e-01	7.918e-03	3492.492
traitale:traitexp.IDf	2.860e-02	-2.948e-02	8.866e-02	2615.823
traitoth:traitexp.IDf	1.251e-01	2.724e-02	2.316e-01	8579.864

traitsSURVf.2:traitexp.IDf	-5.598e+00	-2.230e+01	7.995e+00	519.585
traitREPROdf.2:traitexp.IDf	7.736e+00	-3.099e+00	2.105e+01	81.962
traitshy:traitact.IDf	-4.656e-01	-6.478e-01	-2.910e-01	21410.384
traitexp:traitact.IDf	1.394e-01	2.863e-02	2.550e-01	16024.791
traitact:traitact.IDf	4.539e-01	2.826e-01	6.379e-01	19816.750
traitsoc:traitact.IDf	5.547e-02	-6.215e-02	1.734e-01	13883.258
traitavo:traitact.IDf	-1.456e-01	-2.705e-01	-2.350e-02	13847.234
traitale:traitact.IDf	8.768e-02	-2.215e-02	1.979e-01	17056.542
traitoth:traitact.IDf	3.467e-01	1.994e-01	4.955e-01	14436.423
traitsSURVf.2:traitact.IDf	-1.462e+00	-1.781e+01	1.401e+01	288.076
traitREPROdf.2:traitact.IDf	9.570e+00	-4.317e+00	2.874e+01	19.248
traitshy:traitsoc.IDf	-6.582e-02	-1.901e-01	6.097e-02	13014.822
traitexp:traitsoc.IDf	4.050e-02	-3.210e-02	1.151e-01	1837.460
traitact:traitsoc.IDf	5.547e-02	-6.215e-02	1.734e-01	13883.258
traitsoc:traitsoc.IDf	1.197e-01	1.344e-02	2.520e-01	4148.428
traitavo:traitsoc.IDf	-1.122e-01	-2.423e-01	-7.454e-03	4435.971
traitale:traitsoc.IDf	1.194e-03	-7.328e-02	7.255e-02	2300.088
traitoth:traitsoc.IDf	5.217e-02	-5.388e-02	1.613e-01	8139.756
traitsSURVf.2:traitsoc.IDf	-6.805e+00	-2.567e+01	7.210e+00	202.827
traitREPROdf.2:traitsoc.IDf	4.227e+00	-1.326e+01	2.064e+01	32.836
traitshy:traitavo.IDf	1.691e-01	3.877e-02	3.034e-01	13501.102
traitexp:traitavo.IDf	-6.515e-02	-1.444e-01	7.918e-03	3492.492
traitact:traitavo.IDf	-1.456e-01	-2.705e-01	-2.350e-02	13847.234
traitsoc:traitavo.IDf	-1.122e-01	-2.423e-01	-7.454e-03	4435.971
traitavo:traitavo.IDf	1.419e-01	2.464e-02	2.774e-01	5177.352
traitale:traitavo.IDf	-2.378e-02	-9.940e-02	5.229e-02	3613.387
traitoth:traitavo.IDf	-1.302e-01	-2.485e-01	-1.832e-02	9975.742
traitsSURVf.2:traitavo.IDf	4.361e+00	-1.039e+01	2.302e+01	277.709
traitREPROdf.2:traitavo.IDf	-5.700e+00	-2.016e+01	8.322e+00	56.072
traitshy:traitale.IDf	-8.327e-02	-1.988e-01	3.150e-02	16747.175
traitexp:traitale.IDf	2.860e-02	-2.948e-02	8.866e-02	2615.823
traitact:traitale.IDf	8.768e-02	-2.215e-02	1.979e-01	17056.542
traitsoc:traitale.IDf	1.194e-03	-7.328e-02	7.255e-02	2300.088
traitavo:traitale.IDf	-2.378e-02	-9.940e-02	5.229e-02	3613.387
traitale:traitale.IDf	8.202e-02	8.382e-03	1.686e-01	724.548
traitoth:traitale.IDf	7.033e-02	-2.459e-02	1.673e-01	7678.923
traitsSURVf.2:traitale.IDf	6.623e+00	-8.228e+00	2.814e+01	131.287
traitREPROdf.2:traitale.IDf	6.638e+00	-4.551e+00	1.947e+01	69.884
traitshy:traitoth.IDf	-3.688e-01	-5.302e-01	-2.146e-01	16575.455
traitexp:traitoth.IDf	1.251e-01	2.724e-02	2.316e-01	8579.864
traitact:traitoth.IDf	3.467e-01	1.994e-01	4.955e-01	14436.423
traitsoc:traitoth.IDf	5.217e-02	-5.388e-02	1.613e-01	8139.756
traitavo:traitoth.IDf	-1.302e-01	-2.485e-01	-1.832e-02	9975.742
traitale:traitoth.IDf	7.033e-02	-2.459e-02	1.673e-01	7678.923
traitoth:traitoth.IDf	3.233e-01	1.603e-01	4.952e-01	12971.774
traitsSURVf.2:traitoth.IDf	-6.376e+00	-2.584e+01	9.393e+00	110.553
traitREPROdf.2:traitoth.IDf	8.600e+00	-4.801e+00	2.526e+01	31.755
traitshy:traitsURVf.2.IDf	1.712e+00	-1.377e+01	1.825e+01	439.269
traitexp:traitsURVf.2.IDf	-5.598e+00	-2.230e+01	7.995e+00	519.585
traitact:traitsURVf.2.IDf	-1.462e+00	-1.781e+01	1.401e+01	288.076
traitsoc:traitsURVf.2.IDf	-6.805e+00	-2.567e+01	7.210e+00	202.827
traitavo:traitsURVf.2.IDf	4.361e+00	-1.039e+01	2.302e+01	277.709
traitale:traitsURVf.2.IDf	6.623e+00	-8.228e+00	2.814e+01	131.287
traitoth:traitsURVf.2.IDf	-6.376e+00	-2.584e+01	9.393e+00	110.553
traitsSURVf.2:traitsSURVf.2.IDf	7.827e+03	1.583e+01	1.815e+04	2.673
traitREPROdf.2:traitsSURVf.2.IDf	1.093e+03	-3.418e+02	3.119e+03	24.453
traitshy:traitREPROdf.2.IDf	-1.238e+01	-3.035e+01	1.825e+00	22.645
traitexp:traitREPROdf.2.IDf	7.736e+00	-3.099e+00	2.105e+01	81.962
traitact:traitREPROdf.2.IDf	9.570e+00	-4.317e+00	2.874e+01	19.248
traitsoc:traitREPROdf.2.IDf	4.227e+00	-1.326e+01	2.064e+01	32.836
traitavo:traitREPROdf.2.IDf	-5.700e+00	-2.016e+01	8.322e+00	56.072
traitale:traitREPROdf.2.IDf	6.638e+00	-4.551e+00	1.947e+01	69.884
traitoth:traitREPROdf.2.IDf	8.600e+00	-4.801e+00	2.526e+01	31.755
traitsSURVf.2:traitREPROdf.2.IDf	1.093e+03	-3.418e+02	3.119e+03	24.453
traitREPROdf.2:traitREPROdf.2.IDf	2.976e+03	9.233e+00	7.131e+03	3.309

~idh(trait):AREA_TYPEf:AREAf

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy.AREA_TYPEf:AREAf	0.01578	5.767e-05	6.255e-02	96658.9
traitexp.AREA_TYPEf:AREAf	0.02737	7.669e-05	1.002e-01	100000.0
traitact.AREA_TYPEf:AREAf	0.02179	5.975e-05	8.907e-02	32227.9
traitsoc.AREA_TYPEf:AREAf	0.03635	8.260e-05	1.307e-01	63746.1
traitavo.AREA_TYPEf:AREAf	0.01596	6.780e-05	6.290e-02	100000.0
traitale.AREA_TYPEf:AREAf	0.02946	4.761e-05	1.106e-01	80000.2
traitoth.AREA_TYPEf:AREAf	0.05565	8.772e-05	1.925e-01	46314.4
traitsURVf.2.AREA_TYPEf:AREAf	52.61433	6.910e-05	2.022e+02	24825.3
traitREPROdf.2.AREA_TYPEf:AREAf	225.80887	7.117e-05	1.075e+03	920.4

R-structure: ~us(trait):units (Within-individual variance - covariance estimates)

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.units	0.4616720	0.34475	0.58965	27469
traitexp:traitshy.units	-0.3133409	-0.42297	-0.20610	17882
traitact:traitshy.units	-0.3733016	-0.48859	-0.26419	32675
traitsoc:traitshy.units	-0.0140940	-0.12587	0.09501	18737
traitavo:traitshy.units	0.0712017	-0.03651	0.18351	18525
traitale:traitshy.units	-0.0366033	-0.13867	0.06162	23114
traitoth:traitshy.units	-0.1789147	-0.28266	-0.07837	25427
traitsURVf.2:traitshy.units	0.0125992	-0.30015	0.32600	11068
traitREPROdf.2:traitshy.units	0.0025370	-0.31548	0.32363	11727
traitshy:traitexp.units	-0.3133409	-0.42297	-0.20610	17882
traitexp:traitexp.units	0.9036278	0.74909	1.06151	14871
traitact:traitexp.units	0.1220173	0.02117	0.22373	28232
traitsoc:traitexp.units	0.0047674	-0.10674	0.11712	6957
traitavo:traitexp.units	-0.0549442	-0.16820	0.05754	11626
traitale:traitexp.units	-0.0413917	-0.14730	0.06412	13142
traitoth:traitexp.units	0.1554558	0.05050	0.26194	14659
traitsURVf.2:traitexp.units	-0.0243910	-0.47248	0.42116	9565
traitREPROdf.2:traitexp.units	0.0065987	-0.44201	0.44019	10734
traitshy:traitact.units	-0.3733016	-0.48859	-0.26419	32675
traitexp:traitact.units	0.1220173	0.02117	0.22373	28232
traitact:traitact.units	0.4573500	0.33817	0.58295	33819
traitsoc:traitact.units	0.0024477	-0.10737	0.11566	18386
traitavo:traitact.units	-0.0428256	-0.15625	0.06536	17620
traitale:traitact.units	0.0720882	-0.02723	0.17550	28663
traitoth:traitact.units	0.1502169	0.05113	0.25078	24453
traitsURVf.2:traitact.units	-0.0045010	-0.30029	0.30357	13428
traitREPROdf.2:traitact.units	-0.0062929	-0.31214	0.29324	13362
traitshy:traitsoc.units	-0.0140940	-0.12587	0.09501	18737
traitexp:traitsoc.units	0.0047674	-0.10674	0.11712	6957
traitact:traitsoc.units	0.0024477	-0.10737	0.11566	18386
traitsoc:traitsoc.units	0.8081697	0.62446	0.98774	10787
traitavo:traitsoc.units	-0.7515642	-0.91928	-0.58670	9285
traitale:traitsoc.units	-0.0916978	-0.20341	0.01899	8723
traitoth:traitsoc.units	0.0423937	-0.07069	0.15485	17748
traitsURVf.2:traitsoc.units	-0.0091680	-0.43394	0.40926	10060
traitREPROdf.2:traitsoc.units	-0.0003661	-0.42462	0.42577	9804
traitshy:traitavo.units	0.0712017	-0.03651	0.18351	18525
traitexp:traitavo.units	-0.0549442	-0.16820	0.05754	11626
traitact:traitavo.units	-0.0428256	-0.15625	0.06536	17620
traitsoc:traitavo.units	-0.7515642	-0.91928	-0.58670	9285
traitavo:traitavo.units	0.8702089	0.69263	1.05544	10673
traitale:traitavo.units	-0.0768529	-0.18916	0.03315	11299
traitoth:traitavo.units	-0.1803029	-0.29706	-0.06641	18250
traitsURVf.2:traitavo.units	0.0103367	-0.43185	0.44956	9292
traitREPROdf.2:traitavo.units	0.0020867	-0.44322	0.44993	9287
traitshy:traitale.units	-0.0366033	-0.13867	0.06162	23114
traitexp:traitale.units	-0.0413917	-0.14730	0.06412	13142
traitact:traitale.units	0.0720882	-0.02723	0.17550	28663
traitsoc:traitale.units	-0.0916978	-0.20341	0.01899	8723
traitavo:traitale.units	-0.0768529	-0.18916	0.03315	11299

traitale:traitale.units	0.8580901	0.70474	1.00935	4465
traitoth:traitale.units	0.0051404	-0.09710	0.10781	11424
traitsURVf.2:traitale.units	0.0065600	-0.42760	0.43629	10587
traitREPROdf.2:traitale.units	0.0016861	-0.43173	0.44670	9893
traitshy:traitoth.units	-0.1789147	-0.28266	-0.07837	25427
traitexp:traitoth.units	0.1554558	0.05050	0.26194	14659
traitact:traitoth.units	0.1502169	0.05113	0.25078	24453
traitsoc:traitoth.units	0.0423937	-0.07069	0.15485	17748
traitavo:traitoth.units	-0.1803029	-0.29706	-0.06641	18250
traitale:traitoth.units	0.0051404	-0.09710	0.10781	11424
traitoth:traitoth.units	0.6073646	0.46953	0.75306	23809
traitsURVf.2:traitoth.units	-0.0051893	-0.36028	0.35458	11946
traitREPROdf.2:traitoth.units	-0.0068093	-0.35933	0.35094	11643
traitshy:traitsURVf.2.units	0.0125992	-0.30015	0.32600	11068
traitexp:traitsURVf.2.units	-0.0243910	-0.47248	0.42116	9565
traitact:traitsURVf.2.units	-0.0045010	-0.30029	0.30357	13428
traitsoc:traitsURVf.2.units	-0.0091680	-0.43394	0.40926	10060
traitavo:traitsURVf.2.units	0.0103367	-0.43185	0.44956	9292
traitale:traitsURVf.2.units	0.0065600	-0.42760	0.43629	10587
traitoth:traitsURVf.2.units	-0.0051893	-0.36028	0.35458	11946
traitsURVf.2:traitsURVf.2.units	0.5000000	0.50000	0.50000	0
traitREPROdf.2:traitsURVf.2.units	0.0000000	0.00000	0.00000	0
traitshy:traitREPROdf.2.units	0.0025370	-0.31548	0.32363	11727
traitexp:traitREPROdf.2.units	0.0065987	-0.44201	0.44019	10734
traitact:traitREPROdf.2.units	-0.0062929	-0.31214	0.29324	13362
traitsoc:traitREPROdf.2.units	-0.0003661	-0.42462	0.42577	9804
traitavo:traitREPROdf.2.units	0.0020867	-0.44322	0.44993	9287
traitale:traitREPROdf.2.units	0.0016861	-0.43173	0.44670	9893
traitoth:traitREPROdf.2.units	-0.0068093	-0.35933	0.35094	11643
traitsURVf.2:traitREPROdf.2.units	0.0000000	0.00000	0.00000	0
traitREPROdf.2:traitREPROdf.2.units	0.5000000	0.50000	0.50000	0

Model output fixed effects

Location effects: cbind(shy, exp, act, soc, avo, ale, oth, SURVf, REPROdf)
~ trait - 1 + trait:AREA_TYPEf + trait:YEARf + trait:bm + at.level(trait, c(1:8)):SEXf +
at.level(trait, c(1:7)):ORDERf

	post.mean	l-95% CI	u-95% CI	eff.samp	pMCMC	
traitshy	0.65639	0.12031	1.19557	17936.34	0.01698	*
traitexp	-0.17769	-0.78388	0.40779	27639.41	0.55210	
traitact	-0.93399	-1.47149	-0.40338	19535.26	0.00110	**
traitsoc	-0.06482	-0.65524	0.52333	21722.83	0.82600	
traitavo	-0.10746	-0.69323	0.48221	26213.01	0.71398	
traitale	0.51719	-0.06215	1.10013	27216.56	0.07940	.
traitoth	-0.42562	-1.01836	0.16052	15034.75	0.14770	
traitsURVf.2	62.68016	4.47382	120.46134	10.63	0.00014	***
traitREPROdf.2	54.05420	3.75231	114.48889	11.43	0.00200	**

Effects of area-type on personality traits, survival and reproduction

traitshy:AREA_TYPEfRED-GREY	0.05769	-0.29188	0.39103	49130.15	0.71186	
traitexp:AREA_TYPEfRED-GREY	-0.09967	-0.47704	0.25838	45777.57	0.56450	
traitact:AREA_TYPEfRED-GREY	-0.08439	-0.45418	0.25663	53865.60	0.59364	
traitsoc:AREA_TYPEfRED-GREY	0.44305	0.05891	0.83266	51963.19	0.03356	*
traitavo:AREA_TYPEfRED-GREY	-0.16507	-0.49277	0.16231	47610.14	0.28744	
traitale:AREA_TYPEfRED-GREY	0.13000	-0.24675	0.48678	47223.17	0.42016	
traitoth:AREA_TYPEfRED-GREY	-0.24142	-0.69213	0.22771	64670.87	0.24118	
traitsURVf.2:AREA_TYPEfRED-GREY	-14.84952	-53.21532	19.05063	319.54	0.31390	
traitREPROdf.2:AREA_TYPEfRED-GREY	-27.88988	-83.21459	17.76288	34.43	0.15696	

Effect of year on personality traits, survival and reproduction

traitshy:YEARf2017	-0.05552	-0.29558	0.18809	8877.22	0.65190	
traitexp:YEARf2017	-0.30783	-0.55410	-0.05641	12280.16	0.01578	*
traitact:YEARf2017	0.31719	0.08163	0.55549	11513.86	0.00910	**
traitsoc:YEARf2017	0.20547	-0.03238	0.44985	14096.84	0.09448	.

Interspecific competition affects the expression of personality-traits in natural populations Wauters et al.

traitavo:YEARf2017	-0.13407	-0.38570	0.11727	17301.36	0.29360	
traitale:YEARf2017	-0.80213	-1.04803	-0.55562	7233.28	< 1e-05	***
traitoth:YEARf2017	0.79276	0.54565	1.03126	7418.18	< 1e-05	***
traitsURVf.2:YEARf2017	-41.57733	-83.38803	-2.05363	10.53	< 1e-05	***
traitREPROdf.2:YEARf2017	-48.10580	-91.29551	-20.27583	12.73	< 1e-05	***

Effect of body mass on personality traits, survival and reproduction

traitshy:bm	0.02478	-0.10196	0.15177	6669.84	0.69900	
traitexp:bm	0.06359	-0.06601	0.19064	10636.59	0.33136	
traitact:bm	-0.05100	-0.17626	0.07189	8357.44	0.41626	
traitsoc:bm	0.08286	-0.04256	0.21067	8494.08	0.19984	
traitavo:bm	-0.09303	-0.22360	0.03810	11781.48	0.16466	
traitale:bm	-0.10163	-0.22667	0.02340	10890.50	0.11282	
traitoth:bm	0.03927	-0.08714	0.16389	7454.52	0.53778	
traitsURVf.2:bm	4.89446	-9.46027	19.42876	72.14	0.37504	
traitREPROdf.2:bm	43.51851	15.09151	81.92606	10.68	< 1e-05	***

Effects of sex on personality traits, survival

at.level(shy, c(1:8))1:SEXff	-0.15368	-0.43144	0.13324	5534.62	0.28534	
at.level(exp, c(1:8))2:SEXff	0.01153	-0.24372	0.27297	7520.94	0.92724	
at.level(act, c(1:8))3:SEXff	0.19262	-0.07366	0.46744	11603.36	0.16204	
at.level(soc, c(1:8))4:SEXff	0.22719	-0.02409	0.47925	7830.94	0.07714	.
at.level(avo, c(1:8))5:SEXff	-0.28581	-0.54798	-0.02406	10430.18	0.03342	*
at.level(ale, c(1:8))6:SEXff	0.10449	-0.14642	0.34668	19373.17	0.40356	
at.level(oth, c(1:8))7:SEXff	-0.01717	-0.28002	0.24379	12954.82	0.89804	
at.level(surv, c(1:8))8:SEXff	15.84768	-15.54971	57.17736	117.49	0.31248	

Effects of arena test order on personality traits

at.level(shy, c(1:7))1:ORDERf1	-0.87544	-1.32666	-0.42677	20777.73	4e-05	***
at.level(exp, c(1:7))2:ORDERf1	0.54066	0.01042	1.07478	29438.12	0.04606	*
at.level(act, c(1:7))3:ORDERf1	1.06456	0.62742	1.51126	24252.84	< 1e-05	***
at.level(soc, c(1:7))4:ORDERf1	-0.41545	-0.92470	0.10950	19312.72	0.11414	
at.level(avo, c(1:7))5:ORDERf1	0.39240	-0.13828	0.93162	25535.35	0.14952	
at.level(ale, c(1:7))6:ORDERf1	-0.26670	-0.79533	0.25055	27002.28	0.31580	
at.level(oth, c(1:7))7:ORDERf1	0.26859	-0.20123	0.74917	14967.20	0.26858	
at.level(shy, c(1:7))1:ORDERf2	-0.25738	-0.69076	0.17711	28459.12	0.24252	
at.level(exp, c(1:7))2:ORDERf2	0.26399	-0.27441	0.80047	37344.04	0.33714	
at.level(act, c(1:7))3:ORDERf2	0.38067	-0.04054	0.81631	32930.05	0.08256	.
at.level(soc, c(1:7))4:ORDERf2	-0.34727	-0.86963	0.16651	28827.45	0.18680	
at.level(avo, c(1:7))5:ORDERf2	0.40793	-0.11313	0.95534	37698.42	0.13378	
at.level(ale, c(1:7))6:ORDERf2	-0.24636	-0.77596	0.27790	29987.98	0.35564	
at.level(oth, c(1:7))7:ORDERf2	0.10341	-0.36893	0.57032	21252.08	0.66766	
at.level(shy, c(1:7))1:ORDERf3	-0.30437	-0.74159	0.11671	72607.33	0.16062	
at.level(exp, c(1:7))2:ORDERf3	0.18334	-0.40073	0.75472	74906.46	0.53578	
at.level(act, c(1:7))3:ORDERf3	0.39945	-0.03291	0.81591	76331.05	0.06446	.
at.level(soc, c(1:7))4:ORDERf3	-0.35490	-0.91516	0.18856	47462.80	0.20588	
at.level(avo, c(1:7))5:ORDERf3	0.36250	-0.20339	0.94140	70747.32	0.21194	
at.level(ale, c(1:7))6:ORDERf3	0.01100	-0.55600	0.57640	54584.64	0.96976	
at.level(oth, c(1:7))7:ORDERf3	0.02251	-0.45530	0.50750	52131.55	0.93062	

Correlation analysis

correlation with survival

Correlation estimates for shyness-survival

Mean: 0.03274341

Marginal parameters posterior mode: 0.01742753

Highest Posterior Density interval: -0.21429 0.2823377

Correlation estimates for exploration-survival

Mean: -0.2214111

Marginal parameters posterior mode: -0.2525842

Highest Posterior Density interval: -0.7244422 0.3052665

Correlation estimates for activity-survival

Mean: -0.02604208

Marginal parameters posterior mode: -0.02780341

Highest Posterior Density interval: -0.2821705 0.2309646

Correlation estimates for sociability-survival

Mean: -0.2450685

Marginal parameters posterior mode: -0.224419

Highest Posterior Density interval: -0.7851539 0.2667296

Correlation estimates for avoidance-survival

Mean: 0.1349096

Marginal parameters posterior mode: 0.15363

Highest Posterior Density interval: -0.349693 0.6418636

Correlation estimates for alert-survival

Mean: 0.2435647

Marginal parameters posterior mode: 0.3439264

Highest Posterior Density interval: -0.3962007 0.8310232

Correlation estimates for other-survival

Mean: -0.1321872

Marginal parameters posterior mode: -0.1532009

Highest Posterior Density interval: -0.4552511 0.2010649

correlation with reproduction

Correlation estimates for shyness-reproduction

Mean: -0.3357251

Marginal parameters posterior mode: -0.312562

Highest Posterior Density interval: -0.7351616 0.02010848

Correlation estimates for exploration-reproduction

Mean: 0.4722743

Marginal parameters posterior mode: 0.6104905

Highest Posterior Density interval: -0.06938685 0.9342063

Correlation estimates for activity-reproduction

Mean: 0.2878644

Marginal parameters posterior mode: 0.1954553

Highest Posterior Density interval: -0.1056873 0.7654844

Correlation estimates for sociability-reproduction

Mean: 0.2445107

Marginal parameters posterior mode: 0.495825

Highest Posterior Density interval: -0.6334388 0.9180481

Correlation estimates for avoidance-reproduction

Mean: -0.3154024

Marginal parameters posterior mode: -0.41096

Highest Posterior Density interval: -0.9093162 0.372889

Correlation estimates for alert-reproduction

Mean: 0.4662205

Marginal parameters posterior mode: 0.8624024

Highest Posterior Density interval: -0.2393639 0.983493

Correlation estimates for other-reproduction

Mean: 0.3330506

Marginal parameters posterior mode: 0.2472986

Highest Posterior Density interval: -0.1138344 0.7880943

Interspecific competition affects the expression of personality-traits in natural populations Wauters et al.

Note: The personality trait avoidance was expressed slightly more by males than by females. In both coniferous or deciduous habitats, red squirrels display intra-sexual territoriality among adult females, while male space use is characterized by both intra- and intersexual core-area overlap based on a dominance hierarchy related to age and body mass (Di Pierro, Molinari, Tosi, & Wauters, 2008; Wauters & Dhondt, 1992). Amicable social behaviours are rare in the field and animals foraging in close proximity tend to avoid or chase each other (e.g. Wauters & Dhondt, 1987; Wauters & Gurnell, 1999). For males the decision to chase or avoid interactions might depend more strongly from cues related to the potential opponent than for the more territorial females, which could explain why in MIS males tend to avoid more their mirror image than females.

Interspecific competition affects the expression of personality-traits in natural populations Wauters et al.

Table S4. Correlation matrix (r values and 95% Credibility Intervals based on the MCMCglmm model in Table S3) between the personality trait scores of red squirrels. Significant correlations in bold.

Trait	Exploration	Shyness	Sociability	Avoidance	Other	Alert
Activity	0.68 (0.31 – 0.97)	-0.97 (-0.99 - -0.93)	0.26 (-0.27 – 0.81)	-0.60 (-0.96 - -0.20)	0.91 (0.80 – 0.99)	0.47 (-0.03 – 0.94)
Exploration		-0.73 (-0.98 - -0.40)	0.40 (-0.23 – 0.93)	-0.58 (-0.97 – -0.07)	0.72 (0.37 – 0.98)	0.34 (-0.27 – 0.91)
Shyness			-0.28 (-0.82 – 0.24)	0.65 (0.29 – 0.97)	-0.91 (-0.99 - -0.81)	-0.42 (-0.91 – 0.11)
Sociability				-0.83 (-0.98 - -0.59)	0.28 (-0.26 – 0.86)	0.04 (-0.65 – 0.77)
Avoidance					-0.63 (-0.97 - -0.23)	-0.24 (-0.89 – 0.42)
Other						0.45 (-0.09 – 0.93)

Activity and shyness are strongly negatively correlated indicating they are the two extremes of an activity-shyness axis. Activity is positively correlated with exploration suggesting a behavioral syndrome of active squirrels having also stronger tendency to explore than less active ones (see also Santicchia et al., 2018a). MIS revealed a negative correlation between sociability and avoidance. Squirrels expressing high activity and exploration in OFT tended to show low avoidance in MIS, while animals defined as shy during OFT showed high avoidance during MIS.

Table S5. MCMCglmm outputs of the two submodels, one for Red-grey sites and one for the Red-only sites calculated to allow estimates of interactions of the dependent variables with area-type (for detailed description see Statistical Analysis).

1) Red-Grey sites summary

Iterations = 50001:1049961
Thinning interval = 40
Sample size = 25000

DIC: 1499.768

G-structure: ~us(trait):IDf

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.IDf	0.45223	0.208166	7.112e-01	6113.549
traitemp:traitshy.IDf	-0.14384	-0.307048	6.561e-03	3065.567
traitact:traitshy.IDf	-0.37287	-0.602489	-1.585e-01	5723.317
traitsoc:traitshy.IDf	-0.10075	-0.299890	1.051e-01	3572.432
traitavo:traitshy.IDf	0.19824	-0.002452	3.960e-01	4176.013
traitale:traitshy.IDf	-0.06017	-0.221851	9.015e-02	2857.684
traitoth:traitshy.IDf	-0.30312	-0.499942	-1.164e-01	5566.443
traitsURVf.2:traitshy.IDf	0.86604	-5.923667	7.986e+00	431.120
traitREPROdf.2:traitshy.IDf	0.68930	-3.888469	6.304e+00	37.643
traitshy:traitemp.IDf	-0.14384	-0.307048	6.561e-03	3065.567
traitemp:traitemp.IDf	0.10709	0.010515	2.264e-01	1977.117
traitact:traitemp.IDf	0.11341	-0.011554	2.565e-01	2877.584
traitsoc:traitemp.IDf	0.04812	-0.111978	2.039e-01	1507.582
traitavo:traitemp.IDf	-0.07292	-0.224460	8.522e-02	1606.403
traitale:traitemp.IDf	0.01050	-0.080630	9.974e-02	2033.799
traitoth:traitemp.IDf	0.10867	-0.015285	2.448e-01	3631.313
traitsURVf.2:traitemp.IDf	-1.52140	-8.436602	5.364e+00	305.958
traitREPROdf.2:traitemp.IDf	-1.01577	-5.205388	2.890e+00	121.466
traitshy:traitact.IDf	-0.37287	-0.602489	-1.585e-01	5723.317
traitemp:traitact.IDf	0.11341	-0.011554	2.565e-01	2877.584
traitact:traitact.IDf	0.33188	0.134563	5.562e-01	5346.001
traitsoc:traitact.IDf	0.05260	-0.129401	2.424e-01	2817.877
traitavo:traitact.IDf	-0.13031	-0.313514	5.197e-02	3279.958
traitale:traitact.IDf	0.06436	-0.068958	2.117e-01	1987.136
traitoth:traitact.IDf	0.24830	0.084020	4.242e-01	5422.063
traitsURVf.2:traitact.IDf	-1.86742	-9.144072	4.243e+00	217.058
traitREPROdf.2:traitact.IDf	-0.80456	-5.668689	3.342e+00	44.501
traitshy:traitsoc.IDf	-0.10075	-0.299890	1.051e-01	3572.432
traitemp:traitsoc.IDf	0.04812	-0.111978	2.039e-01	1507.582
traitact:traitsoc.IDf	0.05260	-0.129401	2.424e-01	2817.877
traitsoc:traitsoc.IDf	0.41585	0.105552	7.357e-01	1680.673
traitavo:traitsoc.IDf	-0.39987	-0.700401	-1.169e-01	1927.052
traitale:traitsoc.IDf	-0.06594	-0.238523	9.222e-02	1218.325
traitoth:traitsoc.IDf	0.06748	-0.124931	2.567e-01	1860.769
traitsURVf.2:traitsoc.IDf	-1.26677	-10.257139	6.306e+00	155.973
traitREPROdf.2:traitsoc.IDf	-2.60096	-7.804144	2.134e+00	60.441
traitshy:traitavo.IDf	0.19824	-0.002452	3.960e-01	4176.013
traitemp:traitavo.IDf	-0.07292	-0.224460	8.522e-02	1606.403
traitact:traitavo.IDf	-0.13031	-0.313514	5.197e-02	3279.958
traitsoc:traitavo.IDf	-0.39987	-0.700401	-1.169e-01	1927.052
traitavo:traitavo.IDf	0.43101	0.159166	7.410e-01	2328.935
traitale:traitavo.IDf	0.03702	-0.123702	1.930e-01	1385.083
traitoth:traitavo.IDf	-0.14236	-0.328944	4.513e-02	2211.300
traitsURVf.2:traitavo.IDf	0.86244	-6.934658	9.415e+00	204.778
traitREPROdf.2:traitavo.IDf	2.38875	-2.729009	7.659e+00	56.429
traitshy:traitale.IDf	-0.06017	-0.221851	9.015e-02	2857.684
traitemp:traitale.IDf	0.01050	-0.080630	9.974e-02	2033.799
traitact:traitale.IDf	0.06436	-0.068958	2.117e-01	1987.136
traitsoc:traitale.IDf	-0.06594	-0.238523	9.222e-02	1218.325
traitavo:traitale.IDf	0.03702	-0.123702	1.930e-01	1385.083
traitale:traitale.IDf	0.10363	0.006913	2.320e-01	1350.006
traitoth:traitale.IDf	0.03757	-0.091681	1.690e-01	2651.056
traitsURVf.2:traitale.IDf	-0.73034	-8.955434	6.429e+00	235.501
traitREPROdf.2:traitale.IDf	0.30015	-3.648798	4.111e+00	226.565
traitshy:traitoth.IDf	-0.30312	-0.499942	-1.164e-01	5566.443
traitemp:traitoth.IDf	0.10867	-0.015285	2.448e-01	3631.313

traitact:traitoth.IDf	0.24830	0.084020	4.242e-01	5422.063
traitsoc:traitoth.IDf	0.06748	-0.124931	2.567e-01	1860.769
traitavo:traitoth.IDf	-0.14236	-0.328944	4.513e-02	2211.300
traitale:traitoth.IDf	0.03757	-0.091681	1.690e-01	2651.056
traitoth:traitoth.IDf	0.29826	0.104176	5.170e-01	3177.282
traitsURVf.2:traitoth.IDf	-3.16725	-11.302993	3.224e+00	85.608
traitREPROdf.2:traitoth.IDf	-1.33080	-5.943188	2.875e+00	46.007
traitshy:traitsURVf.2.IDf	0.86604	-5.923667	7.986e+00	431.120
traitexp:traitsURVf.2.IDf	-1.52140	-8.436602	5.364e+00	305.958
traitact:traitsURVf.2.IDf	-1.86742	-9.144072	4.243e+00	217.058
traitsoc:traitsURVf.2.IDf	-1.26677	-10.257139	6.306e+00	155.973
traitavo:traitsURVf.2.IDf	0.86244	-6.934658	9.415e+00	204.778
traitale:traitsURVf.2.IDf	-0.73034	-8.955434	6.429e+00	235.501
traitoth:traitsURVf.2.IDf	-3.16725	-11.302993	3.224e+00	85.608
traitsURVf.2:traitsURVf.2.IDf	859.43446	15.254605	1.770e+03	3.565
traitREPROdf.2:traitsURVf.2.IDf	351.78860	2.781029	7.299e+02	4.787
traitshy:traitREPROdf.2.IDf	0.68930	-3.888469	6.304e+00	37.643
traitexp:traitREPROdf.2.IDf	-1.01577	-5.205388	2.890e+00	121.466
traitact:traitREPROdf.2.IDf	-0.80456	-5.668689	3.342e+00	44.501
traitsoc:traitREPROdf.2.IDf	-2.60096	-7.804144	2.134e+00	60.441
traitavo:traitREPROdf.2.IDf	2.38875	-2.729009	7.659e+00	56.429
traitale:traitREPROdf.2.IDf	0.30015	-3.648798	4.111e+00	226.565
traitoth:traitREPROdf.2.IDf	-1.33080	-5.943188	2.875e+00	46.007
traitsURVf.2:traitREPROdf.2.IDf	351.78860	2.781029	7.299e+02	4.787
traitREPROdf.2:traitREPROdf.2.IDf	222.76316	2.078551	4.646e+02	7.113

~idh(trait):AREAf

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy.AREAf	0.9742	8.521e-05	1.7267	25000
traitexp.AREAf	0.2728	5.936e-05	0.4897	21666
traitact.AREAf	2.3359	1.367e-04	3.0049	25000
traitsoc.AREAf	0.2723	7.248e-05	0.5508	25000
traitavo.AREAf	0.1629	6.217e-05	0.2486	25000
traitale.AREAf	0.1705	7.213e-05	0.2719	25000
traitoth.AREAf	1.2385	1.345e-04	2.3548	25000
traitsURVf.2.AREAf	27.3485	8.379e-05	47.4123	24393
traitREPROdf.2.AREAf	15.9995	6.534e-05	24.0382	25000

R-structure: ~us(trait):units

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.units	0.447889	0.294803	0.61708	7716
traitexp:traitshy.units	-0.240988	-0.384656	-0.10325	4658
traitact:traitshy.units	-0.371334	-0.536607	-0.23203	7100
traitsoc:traitshy.units	0.052153	-0.101461	0.20397	4152
traitavo:traitshy.units	-0.035520	-0.182183	0.10845	3838
traitale:traitshy.units	-0.080340	-0.228210	0.06199	4361
traitoth:traitshy.units	-0.127886	-0.260058	0.00193	6732
traitsURVf.2:traitshy.units	0.019308	-0.301735	0.34059	2143
traitREPROdf.2:traitshy.units	-0.021091	-0.345012	0.31020	2062
traitshy:traitexp.units	-0.240988	-0.384656	-0.10325	4658
traitexp:traitexp.units	0.833737	0.629219	1.04480	9231
traitact:traitexp.units	0.061862	-0.071393	0.19846	4529
traitsoc:traitexp.units	-0.030817	-0.193302	0.12770	2843
traitavo:traitexp.units	-0.003135	-0.164709	0.15122	2986
traitale:traitexp.units	-0.038338	-0.196261	0.11369	10237
traitoth:traitexp.units	0.141438	0.005426	0.28817	6443
traitsURVf.2:traitexp.units	-0.053996	-0.484989	0.39218	1674
traitREPROdf.2:traitexp.units	0.017605	-0.420790	0.46365	1631
traitshy:traitact.units	-0.371334	-0.536607	-0.23203	7100
traitexp:traitact.units	0.061862	-0.071393	0.19846	4529
traitact:traitact.units	0.474945	0.316985	0.65273	5837
traitsoc:traitact.units	-0.018083	-0.170347	0.13805	4000
traitavo:traitact.units	0.007561	-0.141849	0.15406	3827
traitale:traitact.units	0.095999	-0.044548	0.25028	3652
traitoth:traitact.units	0.123915	-0.004036	0.25349	7079
traitsURVf.2:traitact.units	-0.007376	-0.333857	0.31971	2528
traitREPROdf.2:traitact.units	0.020340	-0.309527	0.33909	2209
traitshy:traitsoc.units	0.052153	-0.101461	0.20397	4152
traitexp:traitsoc.units	-0.030817	-0.193302	0.12770	2843
traitact:traitsoc.units	-0.018083	-0.170347	0.13805	4000
traitsoc:traitsoc.units	0.686949	0.425366	0.96520	2087

traitavo:traitsoc.units	-0.598392	-0.856051	-0.38534	2160
traitale:traitsoc.units	-0.072898	-0.249699	0.10093	2186
traitoth:traitsoc.units	-0.024109	-0.177664	0.13500	2642
traitsURVf.2:traitsoc.units	-0.034597	-0.442065	0.39897	1791
traitREPROdf.2:traitsoc.units	0.030528	-0.385554	0.44631	1668
traitshy:traitavo.units	-0.035520	-0.182183	0.10845	3838
traitexp:traitavo.units	-0.003135	-0.164709	0.15122	2986
traitact:traitavo.units	0.007561	-0.141849	0.15406	3827
traitsoc:traitavo.units	-0.598392	-0.856051	-0.38534	2160
traitavo:traitavo.units	0.720863	0.485039	0.97843	2939
traitale:traitavo.units	-0.138493	-0.310527	0.03034	2524
traitoth:traitavo.units	-0.071196	-0.221455	0.07887	3463
traitsURVf.2:traitavo.units	0.036178	-0.401338	0.45641	1702
traitREPROdf.2:traitavo.units	-0.043102	-0.459790	0.38670	1574
traitshy:traitale.units	-0.080340	-0.228210	0.06199	4361
traitexp:traitale.units	-0.038338	-0.196261	0.11369	10237
traitact:traitale.units	0.095999	-0.044548	0.25028	3652
traitsoc:traitale.units	-0.072898	-0.249699	0.10093	2186
traitavo:traitale.units	-0.138493	-0.310527	0.03034	2524
traitale:traitale.units	0.930873	0.717915	1.18107	5483
traitoth:traitale.units	0.032810	-0.111163	0.17672	6171
traitsURVf.2:traitale.units	-0.003959	-0.477137	0.48121	1746
traitREPROdf.2:traitale.units	0.039702	-0.445791	0.49784	1451
traitshy:traitoth.units	-0.127886	-0.260058	0.00193	6732
traitexp:traitoth.units	0.141438	0.005426	0.28817	6443
traitact:traitoth.units	0.123915	-0.004036	0.25349	7079
traitsoc:traitoth.units	-0.024109	-0.177664	0.13500	2642
traitavo:traitoth.units	-0.071196	-0.221455	0.07887	3463
traitale:traitoth.units	0.032810	-0.111163	0.17672	6171
traitoth:traitoth.units	0.537011	0.366568	0.72542	4256
traitsURVf.2:traitoth.units	-0.009837	-0.368810	0.33970	2319
traitREPROdf.2:traitoth.units	0.039557	-0.324033	0.37352	1838
traitshy:traitsURVf.2.units	0.019308	-0.301735	0.34059	2143
traitexp:traitsURVf.2.units	-0.053996	-0.484989	0.39218	1674
traitact:traitsURVf.2.units	-0.007376	-0.333857	0.31971	2528
traitsoc:traitsURVf.2.units	-0.034597	-0.442065	0.39897	1791
traitavo:traitsURVf.2.units	0.036178	-0.401338	0.45641	1702
traitale:traitsURVf.2.units	-0.003959	-0.477137	0.48121	1746
traitoth:traitsURVf.2.units	-0.009837	-0.368810	0.33970	2319
traitsURVf.2:traitsURVf.2.units	0.500000	0.500000	0.50000	0
traitREPROdf.2:traitsURVf.2.units	0.000000	0.000000	0.00000	0
traitshy:traitREPROdf.2.units	-0.021091	-0.345012	0.31020	2062
traitexp:traitREPROdf.2.units	0.017605	-0.420790	0.46365	1631
traitact:traitREPROdf.2.units	0.020340	-0.309527	0.33909	2209
traitsoc:traitREPROdf.2.units	0.030528	-0.385554	0.44631	1668
traitavo:traitREPROdf.2.units	-0.043102	-0.459790	0.38670	1574
traitale:traitREPROdf.2.units	0.039702	-0.445791	0.49784	1451
traitoth:traitREPROdf.2.units	0.039557	-0.324033	0.37352	1838
traitsURVf.2:traitREPROdf.2.units	0.000000	0.000000	0.00000	0
traitREPROdf.2:traitREPROdf.2.units	0.500000	0.500000	0.50000	0

Location effects: cbind(shy, exp, act, soc, avo, ale, oth, SURVf, REPROdf)
~ trait - 1 + trait:YEARf + trait:bm + at.level(trait, c(1:8)):SEXf +
at.level(trait, c(1:7)):ORDERf

	post.mean	l-95% CI	u-95% CI	eff.samp	pMCMC
traitshy	0.346737	-0.623397	1.362666	10537.38	0.43816
traitexp	0.574042	-0.303384	1.455607	6933.84	0.18424
traitact	-1.004893	-2.124848	0.160790	23852.94	0.06776
traitsoc	-0.152718	-1.067087	0.767008	4078.06	0.73008
traitavo	0.100787	-0.770562	0.982556	3792.38	0.81328
traitale	0.405666	-0.463115	1.263920	10773.48	0.35192
traitoth	-0.121668	-1.205073	0.929594	13690.52	0.80520
traitsURVf.2	15.619601	1.570770	29.618376	17.65	0.00840 **
traitREPROdf.2	9.292958	0.876821	17.702782	24.62	0.01392 *
traitshy:YEARf2017	0.121557	-0.244491	0.467962	1730.52	0.50368
traitexp:YEARf2017	-1.108426	-1.461601	-0.760858	6845.81	< 4e-05 ***
traitact:YEARf2017	0.503757	0.165455	0.847537	1818.88	0.00520 **
traitsoc:YEARf2017	0.184787	-0.193505	0.551690	1535.49	0.33072
traitavo:YEARf2017	-0.066917	-0.435642	0.313044	1527.36	0.72104
traitale:YEARf2017	-0.538437	-0.907734	-0.190492	6168.33	0.00424 **
traitoth:YEARf2017	0.692412	0.351986	1.032533	2800.58	< 4e-05 ***
traitsURVf.2:YEARf2017	-13.473165	-24.019416	-1.126401	15.70	0.00088 ***

traitREPROdf.2:YEARf2017	-15.095600	-26.302849	-3.548984	11.92	0.00056	***
traitshy:bm	0.066327	-0.118193	0.235195	5557.90	0.46112	
traitexp:bm	0.003173	-0.173628	0.183141	9472.29	0.96664	
traitact:bm	-0.026641	-0.191822	0.149788	5777.09	0.76160	
traitsoc:bm	0.115250	-0.079092	0.314374	3218.33	0.26032	
traitavo:bm	-0.119380	-0.315427	0.082363	3912.81	0.23736	
traitale:bm	-0.151250	-0.339749	0.037604	13102.77	0.11216	
traitoth:bm	0.010104	-0.159341	0.182861	5486.92	0.90920	
traitSURVf.2:bm	0.197193	-6.818316	7.446056	36.57	0.92360	
traitREPROdf.2:bm	11.903997	3.397128	18.845164	14.60	< 4e-05	***
at.level(trait, c(1:8))1:SEXff	-0.233876	-0.586801	0.131086	5436.31	0.20168	
at.level(trait, c(1:8))2:SEXff	0.101325	-0.223025	0.431025	7671.72	0.53784	
at.level(trait, c(1:8))3:SEXff	0.163528	-0.169043	0.503771	5059.85	0.33208	
at.level(trait, c(1:8))4:SEXff	0.441338	0.052591	0.829225	3502.01	0.02624	*
at.level(trait, c(1:8))5:SEXff	-0.489774	-0.880947	-0.091996	3660.74	0.01560	*
at.level(trait, c(1:8))6:SEXff	0.160428	-0.184485	0.494966	19406.24	0.35440	
at.level(trait, c(1:8))7:SEXff	0.035042	-0.290760	0.379344	7201.79	0.83312	
at.level(trait, c(1:8))8:SEXff	1.297157	-10.222725	14.227834	69.45	0.82088	
at.level(trait, c(1:7))1:ORDERf1	-0.605576	-1.235622	0.040786	5067.78	0.06248	.
at.level(trait, c(1:7))2:ORDERf1	-0.037040	-0.812554	0.710633	4798.85	0.92800	
at.level(trait, c(1:7))3:ORDERf1	1.069601	0.422443	1.695958	5862.15	0.00056	***
at.level(trait, c(1:7))4:ORDERf1	0.123340	-0.625891	0.886699	3321.08	0.74624	
at.level(trait, c(1:7))5:ORDERf1	-0.017095	-0.781526	0.745803	3403.37	0.96512	
at.level(trait, c(1:7))6:ORDERf1	-0.133293	-0.931693	0.632124	8497.02	0.74416	
at.level(trait, c(1:7))7:ORDERf1	-0.229615	-0.900973	0.430848	4803.88	0.50152	
at.level(trait, c(1:7))1:ORDERf2	-0.087528	-0.703917	0.516738	6260.46	0.77776	
at.level(trait, c(1:7))2:ORDERf2	-0.062594	-0.807038	0.685480	7484.21	0.87144	
at.level(trait, c(1:7))3:ORDERf2	0.409888	-0.197294	1.019065	7257.06	0.18664	
at.level(trait, c(1:7))4:ORDERf2	-0.040151	-0.760730	0.697518	4047.89	0.91208	
at.level(trait, c(1:7))5:ORDERf2	0.203927	-0.540920	0.939868	4087.94	0.58424	
at.level(trait, c(1:7))6:ORDERf2	-0.107427	-0.885603	0.662220	12261.36	0.78704	
at.level(trait, c(1:7))7:ORDERf2	-0.250367	-0.875992	0.401256	7328.51	0.43904	
at.level(trait, c(1:7))1:ORDERf3	-0.022180	-0.594297	0.577718	14566.01	0.94240	
at.level(trait, c(1:7))2:ORDERf3	-0.256356	-1.020652	0.541961	15096.39	0.52320	
at.level(trait, c(1:7))3:ORDERf3	0.107910	-0.486900	0.708794	17363.56	0.71952	
at.level(trait, c(1:7))4:ORDERf3	-0.072124	-0.797569	0.655146	8258.43	0.84208	
at.level(trait, c(1:7))5:ORDERf3	0.156826	-0.599808	0.886188	10163.26	0.67152	
at.level(trait, c(1:7))6:ORDERf3	0.116265	-0.713454	0.913952	15858.71	0.77976	
at.level(trait, c(1:7))7:ORDERf3	-0.548719	-1.158044	0.105964	14159.91	0.09416	.

Correlation analysis

correlation with survival

Correlation estimates for shyness-survival

Mean: 0.04871845

Marginal parameters posterior mode: 0.08606807

Highest Posterior Density interval: -0.282412 0.3881313

Correlation estimates for exploration-survival

Mean: -0.1932554

Marginal parameters posterior mode: -0.3180277

Highest Posterior Density interval: -0.8203025 0.4839247

Correlation estimates for activity-survival

Mean: -0.1191214

Marginal parameters posterior mode: -0.09732655

Highest Posterior Density interval: -0.4944661 0.2441474

Correlation estimates for sociability-survival

Mean: -0.06168476

Marginal parameters posterior mode: -0.003457743

Highest Posterior Density interval: -0.4806388 0.3565331

Correlation estimates for avoidance-survival

Mean: 0.03805248

Marginal parameters posterior mode: 0.0006237439

Highest Posterior Density interval: -0.3767508 0.4259202

Correlation estimates for alert-survival

Mean: -0.0879861
 Marginal parameters posterior mode: -0.05722858
 Highest Posterior Density interval: -0.8434349 0.6343751

Correlation estimates for other-survival

Mean: -0.2093157
 Marginal parameters posterior mode: -0.2560751
 Highest Posterior Density interval: -0.6122165 0.2230251

correlation with reproduction

Correlation estimates for shyness-reproduction

Mean: 0.06526915
 Marginal parameters posterior mode: 0.006928147
 Highest Posterior Density interval: -0.4018751 0.5720033

Correlation estimates for exploration-reproduction

Mean: -0.233665
 Marginal parameters posterior mode: -0.4370985
 Highest Posterior Density interval: -0.9203873 0.476229

Correlation estimates for activity-reproduction

Mean: -0.08938369
 Marginal parameters posterior mode: 0.006218858
 Highest Posterior Density interval: -0.626288 0.4060403

Correlation estimates for sociability-reproduction

Mean: -0.2964138
 Marginal parameters posterior mode: -0.3517965
 Highest Posterior Density interval: -0.767487 0.2324247

Correlation estimates for avoidance-reproduction

Mean: 0.2614671
 Marginal parameters posterior mode: 0.3286697
 Highest Posterior Density interval: -0.278389 0.7261405

Correlation estimates for alert-reproduction

Mean: 0.07561613
 Marginal parameters posterior mode: 0.1612611
 Highest Posterior Density interval: -0.7131155 0.8202925

Correlation estimates for other-reproduction

Mean: -0.1687436
 Marginal parameters posterior mode: -0.2102566
 Highest Posterior Density interval: -0.6901834 0.376124

2. Red only areas summary

 Iterations = 50001:1049961
 Thinning interval = 40
 Sample size = 25000

DIC: 1527.789

G-structure: ~us(trait):IDf

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.IDf	5.297e-01	2.117e-01	8.847e-01	3943.617
traitemp:traitshy.IDf	-2.708e-01	-4.977e-01	-4.572e-02	1719.021
traitact:traitshy.IDf	-4.799e-01	-7.909e-01	-1.833e-01	4372.810
traitsoc:traitshy.IDf	-5.860e-02	-2.107e-01	8.704e-02	2119.751
traitavo:traitshy.IDf	1.408e-01	-2.867e-02	3.265e-01	1576.750
traitale:traitshy.IDf	-7.758e-02	-2.636e-01	1.055e-01	1014.462
traitoth:traitshy.IDf	-4.094e-01	-6.953e-01	-1.378e-01	2581.700
traitsURVf.2:traitshy.IDf	3.557e+00	-3.317e+00	1.178e+01	124.945
traitREPROd.2:traitshy.IDf	-1.479e+01	-3.523e+01	2.457e+00	11.033
traitshy:traitemp.IDf	-2.708e-01	-4.977e-01	-4.572e-02	1719.021

traitexp:traitexp.IDf	2.377e-01	4.962e-02	4.511e-01	1465.441
traitact:traitexp.IDf	2.224e-01	2.651e-02	4.294e-01	1998.522
traitsoc:traitexp.IDf	4.852e-02	-5.037e-02	1.578e-01	1410.132
traitavo:traitexp.IDf	-7.738e-02	-2.064e-01	3.714e-02	1585.550
traitale:traitexp.IDf	3.528e-02	-9.630e-02	1.665e-01	1080.735
traitoth:traitexp.IDf	2.214e-01	2.541e-02	4.260e-01	3085.816
traitsURVf.2:traitexp.IDf	-5.196e+00	-1.499e+01	1.553e+00	39.049
traitREPROdf.2:traitexp.IDf	1.062e+01	-1.025e+00	2.238e+01	49.830
traitshy:traitact.IDf	-4.799e-01	-7.909e-01	-1.833e-01	4372.810
traitexp:traitact.IDf	2.224e-01	2.651e-02	4.294e-01	1998.522
traitact:traitact.IDf	4.911e-01	2.082e-01	7.997e-01	5037.580
traitsoc:traitact.IDf	5.360e-02	-8.365e-02	1.989e-01	2153.132
traitavo:traitact.IDf	-1.360e-01	-3.043e-01	2.763e-02	2203.481
traitale:traitact.IDf	9.802e-02	-6.984e-02	2.776e-01	1574.836
traitoth:traitact.IDf	4.051e-01	1.585e-01	6.793e-01	2619.872
traitsURVf.2:traitact.IDf	-1.531e+00	-8.980e+00	5.264e+00	236.261
traitREPROdf.2:traitact.IDf	1.256e+01	-4.557e+00	3.235e+01	10.031
traitshy:traitsoc.IDf	-5.860e-02	-2.107e-01	8.704e-02	2119.751
traitexp:traitsoc.IDf	4.852e-02	-5.037e-02	1.578e-01	1410.132
traitact:traitsoc.IDf	5.360e-02	-8.365e-02	1.989e-01	2153.132
traitsoc:traitsoc.IDf	6.444e-02	5.266e-03	1.441e-01	1647.586
traitavo:traitsoc.IDf	-6.067e-02	-1.512e-01	4.456e-03	2107.655
traitale:traitsoc.IDf	9.223e-03	-6.844e-02	8.598e-02	939.829
traitoth:traitsoc.IDf	5.677e-02	-7.715e-02	1.958e-01	2305.063
traitsURVf.2:traitsoc.IDf	-2.382e+00	-8.682e+00	2.865e+00	565.215
traitREPROdf.2:traitsoc.IDf	3.130e+00	-4.928e+00	1.271e+01	357.090
traitshy:traitavo.IDf	1.408e-01	-2.867e-02	3.265e-01	1576.750
traitexp:traitavo.IDf	-7.738e-02	-2.064e-01	3.714e-02	1585.550
traitact:traitavo.IDf	-1.360e-01	-3.043e-01	2.763e-02	2203.481
traitsoc:traitavo.IDf	-6.067e-02	-1.512e-01	4.456e-03	2107.655
traitavo:traitavo.IDf	9.517e-02	7.135e-03	2.077e-01	2295.804
traitale:traitavo.IDf	-3.959e-02	-1.355e-01	4.310e-02	2194.784
traitoth:traitavo.IDf	-1.457e-01	-3.204e-01	1.578e-02	2212.509
traitsURVf.2:traitavo.IDf	1.531e+00	-4.948e+00	7.885e+00	537.643
traitREPROdf.2:traitavo.IDf	-3.644e+00	-1.376e+01	4.489e+00	512.535
traitshy:traitale.IDf	-7.758e-02	-2.636e-01	1.055e-01	1014.462
traitexp:traitale.IDf	3.528e-02	-9.630e-02	1.665e-01	1080.735
traitact:traitale.IDf	9.802e-02	-6.984e-02	2.776e-01	1574.836
traitsoc:traitale.IDf	9.223e-03	-6.844e-02	8.598e-02	939.829
traitavo:traitale.IDf	-3.959e-02	-1.355e-01	4.310e-02	2194.784
traitale:traitale.IDf	1.123e-01	1.104e-02	2.465e-01	1483.731
traitoth:traitale.IDf	9.593e-02	-6.235e-02	2.729e-01	2961.637
traitsURVf.2:traitale.IDf	6.798e-01	-6.719e+00	7.830e+00	268.147
traitREPROdf.2:traitale.IDf	3.011e+00	-7.140e+00	1.386e+01	133.107
traitshy:traitoth.IDf	-4.094e-01	-6.953e-01	-1.378e-01	2581.700
traitexp:traitoth.IDf	2.214e-01	2.541e-02	4.260e-01	3085.816
traitact:traitoth.IDf	4.051e-01	1.585e-01	6.793e-01	2619.872
traitsoc:traitoth.IDf	5.677e-02	-7.715e-02	1.958e-01	2305.063
traitavo:traitoth.IDf	-1.457e-01	-3.204e-01	1.578e-02	2212.509
traitale:traitoth.IDf	9.593e-02	-6.235e-02	2.729e-01	2961.637
traitoth:traitoth.IDf	4.509e-01	1.462e-01	7.678e-01	2232.288
traitsURVf.2:traitoth.IDf	-1.908e+00	-1.069e+01	5.693e+00	116.509
traitREPROdf.2:traitoth.IDf	7.772e+00	-8.281e+00	2.694e+01	17.087
traitshy:traitsURVf.2.IDf	3.557e+00	-3.317e+00	1.178e+01	124.945
traitexp:traitsURVf.2.IDf	-5.196e+00	-1.499e+01	1.553e+00	39.049
traitact:traitsURVf.2.IDf	-1.531e+00	-8.980e+00	5.264e+00	236.261
traitsoc:traitsURVf.2.IDf	-2.382e+00	-8.682e+00	2.865e+00	565.215
traitavo:traitsURVf.2.IDf	1.531e+00	-4.948e+00	7.885e+00	537.643
traitale:traitsURVf.2.IDf	6.798e-01	-6.719e+00	7.830e+00	268.147
traitoth:traitsURVf.2.IDf	-1.908e+00	-1.069e+01	5.693e+00	116.509
traitsURVf.2:traitsURVf.2.IDf	7.679e+02	5.534e+00	1.863e+03	2.649
traitREPROdf.2:traitsURVf.2.IDf	-5.917e+02	-1.836e+03	2.905e+01	3.133
traitshy:traitREPROdf.2.IDf	-1.479e+01	-3.523e+01	2.457e+00	11.033
traitexp:traitREPROdf.2.IDf	1.062e+01	-1.025e+00	2.238e+01	49.830
traitact:traitREPROdf.2.IDf	1.256e+01	-4.557e+00	3.235e+01	10.031
traitsoc:traitREPROdf.2.IDf	3.130e+00	-4.928e+00	1.271e+01	357.090
traitavo:traitREPROdf.2.IDf	-3.644e+00	-1.376e+01	4.489e+00	512.535
traitale:traitREPROdf.2.IDf	3.011e+00	-7.140e+00	1.386e+01	133.107
traitoth:traitREPROdf.2.IDf	7.772e+00	-8.281e+00	2.694e+01	17.087
traitsURVf.2:traitREPROdf.2.IDf	-5.917e+02	-1.836e+03	2.905e+01	3.133
traitREPROdf.2:traitREPROdf.2.IDf	1.702e+03	3.320e+01	3.092e+03	3.807

~idh(trait):AREAf

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy.AREaf	0.05823	6.570e-05	0.06840	25000
traitexp.AREaf	0.28311	8.641e-05	0.53534	25000
traitact.AREaf	0.04289	7.031e-05	0.07033	25000
traitsoc.AREaf	0.11718	8.381e-05	0.22016	25000
traitavo.AREaf	0.04035	6.355e-05	0.10382	25000
traitale.AREaf	0.11086	6.975e-05	0.16826	25000
traitoth.AREaf	0.17399	7.201e-05	0.23767	25000
traitSURVf.2.AREaf	59.04039	9.327e-05	47.41397	25000
traitREPROdf.2.AREaf	216.45379	7.286e-05	429.63253	24270

R-structure: ~us(trait):units

	post.mean	l-95% CI	u-95% CI	eff.samp
traitshy:traitshy.units	0.5620600	0.33785	0.81216	3529
traitexp:traitshy.units	-0.2715002	-0.44723	-0.10257	1816
traitact:traitshy.units	-0.4911917	-0.71671	-0.28486	4776
traitsoc:traitshy.units	-0.0743685	-0.22052	0.06201	2296
traitavo:traitshy.units	0.1984121	0.04311	0.35730	1681
traitale:traitshy.units	-0.0561358	-0.21873	0.11053	1155
traitoth:traitshy.units	-0.2398584	-0.43946	-0.05436	2876
traitSURVf.2:traitshy.units	0.0060043	-0.37216	0.36431	1736
traitREPROdf.2:traitshy.units	0.0030406	-0.36034	0.37542	3625
traitshy:traitexp.units	-0.2715002	-0.44723	-0.10257	1816
traitexp:traitexp.units	0.6588662	0.46201	0.87688	3260
traitact:traitexp.units	0.1820036	0.02951	0.35068	2097
traitsoc:traitexp.units	0.0422185	-0.09914	0.17639	4354
traitavo:traitexp.units	-0.0955224	-0.24641	0.05051	4449
traitale:traitexp.units	0.0449301	-0.11387	0.19249	2498
traitoth:traitexp.units	0.0474047	-0.11180	0.21851	4285
traitSURVf.2:traitexp.units	-0.0006673	-0.38176	0.36656	2081
traitREPROdf.2:traitexp.units	-0.0003525	-0.38132	0.37239	3771
traitshy:traitact.units	-0.4911917	-0.71671	-0.28486	4776
traitexp:traitact.units	0.1820036	0.02951	0.35068	2097
traitact:traitact.units	0.5498820	0.33420	0.78078	5279
traitsoc:traitact.units	0.0398950	-0.09915	0.18233	3049
traitavo:traitact.units	-0.1369323	-0.30501	0.01064	2092
traitale:traitact.units	0.0817461	-0.07424	0.25329	1879
traitoth:traitact.units	0.2011782	0.02946	0.39792	2424
traitSURVf.2:traitact.units	-0.0027230	-0.35911	0.36065	2150
traitREPROdf.2:traitact.units	-0.0035360	-0.36676	0.34891	3882
traitshy:traitsoc.units	-0.0743685	-0.22052	0.06201	2296
traitexp:traitsoc.units	0.0422185	-0.09914	0.17639	4354
traitact:traitsoc.units	0.0398950	-0.09915	0.18233	3049
traitsoc:traitsoc.units	0.7632689	0.57379	0.97047	18363
traitavo:traitsoc.units	-0.7299801	-0.92153	-0.54885	15619
traitale:traitsoc.units	-0.0767856	-0.22786	0.07194	6090
traitoth:traitsoc.units	0.1281871	-0.02089	0.27704	7570
traitSURVf.2:traitsoc.units	-0.0317100	-0.42502	0.36471	1793
traitREPROdf.2:traitsoc.units	0.0015618	-0.41563	0.39339	3026
traitshy:traitavo.units	0.1984121	0.04311	0.35730	1681
traitexp:traitavo.units	-0.0955224	-0.24641	0.05051	4449
traitact:traitavo.units	-0.1369323	-0.30501	0.01064	2092
traitsoc:traitavo.units	-0.7299801	-0.92153	-0.54885	15619
traitavo:traitavo.units	0.8778153	0.66556	1.11593	13689
traitale:traitavo.units	-0.0704603	-0.23655	0.08490	10099
traitoth:traitavo.units	-0.3202071	-0.49495	-0.15260	5429
traitSURVf.2:traitavo.units	0.0376822	-0.40220	0.46691	1646
traitREPROdf.2:traitavo.units	-0.0022087	-0.44882	0.43015	2827
traitshy:traitale.units	-0.0561358	-0.21873	0.11053	1155
traitexp:traitale.units	0.0449301	-0.11387	0.19249	2498
traitact:traitale.units	0.0817461	-0.07424	0.25329	1879
traitsoc:traitale.units	-0.0767856	-0.22786	0.07194	6090
traitavo:traitale.units	-0.0704603	-0.23655	0.08490	10099
traitale:traitale.units	0.8707663	0.65169	1.10749	5521
traitoth:traitale.units	0.0117040	-0.15824	0.18183	5069
traitSURVf.2:traitale.units	0.0009537	-0.45012	0.43941	1848
traitREPROdf.2:traitale.units	0.0104348	-0.44781	0.44874	2871
traitshy:traitoth.units	-0.2398584	-0.43946	-0.05436	2876
traitexp:traitoth.units	0.0474047	-0.11180	0.21851	4285
traitact:traitoth.units	0.2011782	0.02946	0.39792	2424
traitsoc:traitoth.units	0.1281871	-0.02089	0.27704	7570

traitavo:traitoth.units	-0.3202071	-0.49495	-0.15260	5429
traitale:traitoth.units	0.0117040	-0.15824	0.18183	5069
traitoth:traitoth.units	0.6522748	0.41474	0.90377	2487
traitsURVf.2:traitoth.units	-0.0185928	-0.41892	0.37589	2291
traitREPROdf.2:traitoth.units	-0.0020804	-0.37409	0.38453	3546
traitshy:traitsURVf.2.units	0.0060043	-0.37216	0.36431	1736
traitexp:traitsURVf.2.units	-0.0006673	-0.38176	0.36656	2081
traitact:traitsURVf.2.units	-0.0027230	-0.35911	0.36065	2150
traitsoc:traitsURVf.2.units	-0.0317100	-0.42502	0.36471	1793
traitavo:traitsURVf.2.units	0.0376822	-0.40220	0.46691	1646
traitale:traitsURVf.2.units	0.0009537	-0.45012	0.43941	1848
traitoth:traitsURVf.2.units	-0.0185928	-0.41892	0.37589	2291
traitsURVf.2:traitsURVf.2.units	0.5000000	0.50000	0.50000	0
traitREPROdf.2:traitsURVf.2.units	0.0000000	0.00000	0.00000	0
traitshy:traitREPROdf.2.units	0.0030406	-0.36034	0.37542	3625
traitexp:traitREPROdf.2.units	-0.0003525	-0.38132	0.37239	3771
traitact:traitREPROdf.2.units	-0.0035360	-0.36676	0.34891	3882
traitsoc:traitREPROdf.2.units	0.0015618	-0.41563	0.39339	3026
traitavo:traitREPROdf.2.units	-0.0022087	-0.44882	0.43015	2827
traitale:traitREPROdf.2.units	0.0104348	-0.44781	0.44874	2871
traitoth:traitREPROdf.2.units	-0.0020804	-0.37409	0.38453	3546
traitsURVf.2:traitREPROdf.2.units	0.0000000	0.00000	0.00000	0
traitREPROdf.2:traitREPROdf.2.units	0.5000000	0.50000	0.50000	0

Location effects: cbind(shy, exp, act, soc, avo, ale, oth, SURVf, REPROdf)
~ trait - 1 + trait:YEARf + trait:bm + at.level(trait, c(1:8)):SEXf
+ at.level(trait, c(1:7)):ORDERf

	post.mean	l-95% CI	u-95% CI	eff.samp	pMCMC	
traitshy	1.163e+00	3.860e-01	1.947e+00	1142.963	0.00584	**
traitexp	-1.082e+00	-1.899e+00	-2.476e-01	7206.673	0.01768	*
traitact	-1.142e+00	-1.938e+00	-3.802e-01	1207.407	0.00584	**
traitsoc	3.867e-01	-3.783e-01	1.152e+00	17386.903	0.30568	
traitavo	-4.133e-01	-1.210e+00	3.761e-01	15426.094	0.30160	
traitale	7.859e-01	-2.536e-02	1.620e+00	10654.590	0.05968	.
traitoth	-1.079e+00	-1.934e+00	-2.472e-01	6120.889	0.01496	*
traitsURVf.2	2.006e+01	2.404e+00	3.820e+01	15.840	0.00352	**
traitREPROdf.2	5.231e+01	9.045e+00	8.762e+01	5.016	0.00464	**
traitshy:YEARf2017	-3.657e-01	-7.515e-01	-3.357e-04	594.488	0.05584	.
traitexp:YEARf2017	5.352e-01	1.967e-01	8.770e-01	1262.366	0.00176	**
traitact:YEARf2017	2.873e-01	-7.349e-02	6.612e-01	771.762	0.12584	
traitsoc:YEARf2017	1.999e-01	-1.218e-01	5.228e-01	7843.611	0.22544	
traitavo:YEARf2017	-1.889e-01	-5.384e-01	1.598e-01	7482.196	0.29032	
traitale:YEARf2017	-1.012e+00	-1.368e+00	-6.565e-01	5093.180	< 4e-05	***
traitoth:YEARf2017	9.940e-01	6.091e-01	1.366e+00	1932.287	< 4e-05	***
traitsURVf.2:YEARf2017	-1.282e+01	-2.488e+01	-7.537e-01	16.274	0.00360	**
traitREPROdf.2:YEARf2017	-3.665e+01	-5.956e+01	-8.274e+00	7.730	< 4e-05	***
traitshy:bm	-2.331e-02	-2.209e-01	1.724e-01	423.709	0.80328	
traitexp:bm	1.074e-01	-6.690e-02	2.872e-01	1124.699	0.22864	
traitact:bm	-3.828e-02	-2.299e-01	1.564e-01	555.309	0.69840	
traitsoc:bm	4.543e-02	-1.143e-01	2.184e-01	7386.125	0.59152	
traitavo:bm	-6.584e-02	-2.410e-01	1.188e-01	9276.265	0.47200	
traitale:bm	-3.108e-02	-2.134e-01	1.548e-01	4643.310	0.74120	
traitoth:bm	9.067e-02	-1.009e-01	2.944e-01	1470.563	0.35728	
traitsURVf.2:bm	5.168e+00	-6.038e-01	1.376e+01	33.977	0.06960	.
traitREPROdf.2:bm	3.380e+01	9.216e+00	5.585e+01	6.287	< 4e-05	***
at.level(trait, c(1:8))1:SEXfF	-9.220e-02	-5.081e-01	3.590e-01	641.722	0.66024	
at.level(trait, c(1:8))2:SEXfF	-1.123e-01	-5.049e-01	2.650e-01	1390.806	0.56376	
at.level(trait, c(1:8))3:SEXfF	2.812e-01	-1.537e-01	7.004e-01	824.295	0.19976	
at.level(trait, c(1:8))4:SEXfF	1.918e-02	-3.611e-01	3.757e-01	7707.227	0.91888	
at.level(trait, c(1:8))5:SEXfF	-8.581e-02	-4.812e-01	3.115e-01	12057.052	0.67792	
at.level(trait, c(1:8))6:SEXfF	4.603e-02	-3.559e-01	4.511e-01	5922.144	0.82168	
at.level(trait, c(1:8))7:SEXfF	-7.188e-02	-5.112e-01	3.763e-01	2107.016	0.75104	
at.level(trait, c(1:8))8:SEXfF	5.933e+00	-7.654e+00	2.076e+01	44.138	0.38544	
at.level(trait, c(1:7))1:ORDERf1	-1.302e+00	-1.983e+00	-5.981e-01	1137.946	0.00064	***
at.level(trait, c(1:7))2:ORDERf1	1.156e+00	4.910e-01	1.842e+00	5411.995	0.00056	***
at.level(trait, c(1:7))3:ORDERf1	1.267e+00	5.860e-01	1.968e+00	1133.775	0.00088	***
at.level(trait, c(1:7))4:ORDERf1	-9.238e-01	-1.589e+00	-2.037e-01	15884.551	0.00936	**
at.level(trait, c(1:7))5:ORDERf1	7.733e-01	2.161e-02	1.518e+00	15328.803	0.04192	*
at.level(trait, c(1:7))6:ORDERf1	-3.904e-01	-1.137e+00	3.699e-01	11061.712	0.31080	
at.level(trait, c(1:7))7:ORDERf1	9.066e-01	1.869e-01	1.629e+00	5175.626	0.01432	*
at.level(trait, c(1:7))1:ORDERf2	-5.485e-01	-1.225e+00	1.401e-01	1660.388	0.11344	
at.level(trait, c(1:7))2:ORDERf2	6.090e-01	-8.695e-02	1.261e+00	6790.527	0.07768	.

```

at.level(trait, c(1:7))3:ORDERf2  5.116e-01 -1.478e-01  1.210e+00  1535.643  0.13512
at.level(trait, c(1:7))4:ORDERf2 -6.174e-01 -1.330e+00  7.908e-02  18001.470  0.08512 .
at.level(trait, c(1:7))5:ORDERf2  5.807e-01 -1.816e-01  1.351e+00  15534.290  0.13584
at.level(trait, c(1:7))6:ORDERf2 -3.472e-01 -1.118e+00  4.223e-01  13443.915  0.37600
at.level(trait, c(1:7))7:ORDERf2  5.388e-01 -1.754e-01  1.252e+00  7257.387  0.13736
at.level(trait, c(1:7))1:ORDERf3 -6.775e-01 -1.362e+00  1.316e-02  6844.801  0.05280 .
at.level(trait, c(1:7))2:ORDERf3  8.257e-01  8.915e-02  1.557e+00  13999.990  0.02816 *
at.level(trait, c(1:7))3:ORDERf3  7.884e-01  9.720e-02  1.452e+00  8834.228  0.02432 *
at.level(trait, c(1:7))4:ORDERf3 -5.728e-01 -1.368e+00  1.902e-01  21141.031  0.15184
at.level(trait, c(1:7))5:ORDERf3  5.280e-01 -3.351e-01  1.352e+00  19538.430  0.21664
at.level(trait, c(1:7))6:ORDERf3 -1.111e-01 -9.648e-01  7.125e-01  18603.313  0.79704
at.level(trait, c(1:7))7:ORDERf3  7.053e-01 -5.125e-02  1.417e+00  19213.410  0.06040 .

```

Correlation analysis

correlation with survival

Correlation estimates for shyness-survival

Mean: 0.1831626

Marginal parameters posterior mode: 0.2095492

Highest Posterior Density interval: -0.1991068 0.5522757

Correlation estimates for exploration-survival

Mean: -0.3849028

Marginal parameters posterior mode: -0.4722765

Highest Posterior Density interval: -0.832006 0.08709697

Correlation estimates for activity-survival

Mean: -0.08559423

Marginal parameters posterior mode: -0.1089444

Highest Posterior Density interval: -0.4744907 0.2906504

Correlation estimates for sociability-survival

Mean: -0.3765683

Marginal parameters posterior mode: -0.7013156

Highest Posterior Density interval: -0.9602636 0.3722449

Correlation estimates for avoidance-survival

Mean: 0.1932249

Marginal parameters posterior mode: 0.3753593

Highest Posterior Density interval: -0.5249633 0.8858688

Correlation estimates for alert-survival

Mean: 0.1072261

Marginal parameters posterior mode: 0.1480126

Highest Posterior Density interval: -0.6155345 0.8529692

Correlation estimates for other-survival

Mean: -0.1013331

Marginal parameters posterior mode: -0.1225898

Highest Posterior Density interval: -0.5289756 0.3397948

correlation with reproduction

Correlation estimates for shyness-reproduction

Mean: -0.5307868

Marginal parameters posterior mode: -0.9621812

Highest Posterior Density interval: -0.9969874 0.01824822

Correlation estimates for exploration-reproduction

Mean: 0.5747016

Marginal parameters posterior mode: 0.6180477

Highest Posterior Density interval: 0.1146062 0.9829026

Correlation estimates for activity-reproduction

Mean: 0.4613425

Marginal parameters posterior mode: 0.7992988

Highest Posterior Density interval: -0.1323227 0.9889971

Correlation estimates for sociability-reproduction

Mean: 0.3048538

Marginal parameters posterior mode: 0.4881044

Highest Posterior Density interval: -0.450145 0.920923

Correlation estimates for avoidance-reproduction

Mean: -0.3035649

Marginal parameters posterior mode: -0.3901898

Highest Posterior Density interval: -0.9253046 0.357138

Correlation estimates for alert-reproduction

Mean: 0.190059

Marginal parameters posterior mode: 0.3306692

Highest Posterior Density interval: -0.6079487 0.916729

Correlation estimates for other-reproduction

Mean: 0.3300943

Marginal parameters posterior mode: 0.1276445

Highest Posterior Density interval: -0.2284801 0.9731371

3. Differences between Red-Grey and Red-only areas

Iterations = 50001:1049961

Thinning interval = 40

Number of chains = 1

Sample size per chain = 25000

differences between areas for shyness and survival

Mean	SD	Naive SE	Time-series SE
-0.134444	0.260377	0.001647	0.017764

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.63786	-0.31287	-0.13533	0.04219	0.38445

differences between areas for exploration and survival

Mean	SD	Naive SE	Time-series SE
0.191647	0.439804	0.002782	0.030417

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.6319	-0.1200	0.1761	0.4984	1.0652

differences between areas for activity and survival

Mean	SD	Naive SE	Time-series SE
-0.033527	0.278090	0.001759	0.020115

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.55900	-0.22549	-0.03935	0.15418	0.52301

differences between areas for sociability and survival

Mean	SD	Naive SE	Time-series SE
0.314884	0.422907	0.002675	0.015759

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.61575	0.04598	0.35763	0.62009	1.02673

differences between areas for avoidance and survival

Mean	SD	Naive SE	Time-series SE
-0.155172	0.430969	0.002726	0.020038

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.9406	-0.4669	-0.1704	0.1378	0.7237

differences between areas for alert and survival

Mean	SD	Naive SE	Time-series SE
-0.195212	0.519388	0.003285	0.025106

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.1718	-0.5589	-0.2095	0.1625	0.8360

differences between areas for other and survival

Mean	SD	Naive SE	Time-series SE
-0.107983	0.325613	0.002059	0.031546

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.7169	-0.3355	-0.1182	0.1112	0.5510

differences between areas for shyness and reproduction

Mean	SD	Naive SE	Time-series SE
0.596056	0.466259	0.002949	0.101868

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.3528	0.2900	0.5768	0.9279	1.4546

differences between areas for exploration and reproduction

Mean	SD	Naive SE	Time-series SE
-0.808367	0.483519	0.003058	0.048845

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.6404	-1.1740	-0.8371	-0.4739	0.1819

differences between areas for activity and reproduction

Mean	SD	Naive SE	Time-series SE
-0.550726	0.469683	0.002971	0.103216

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.4052	-0.8821	-0.5527	-0.2493	0.4452

differences between areas for sociability and reproduction

Mean	SD	Naive SE	Time-series SE
-0.60127	0.43805	0.00277	0.02059

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.3863	-0.9142	-0.6244	-0.3078	0.3114

differences between areas for avoidance and reproduction

Mean	SD	Naive SE	Time-series SE
0.565032	0.449247	0.002841	0.030783

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-0.3661	0.2633	0.5852	0.8892	1.3653

differences between areas for alert and reproduction

Mean	SD	Naive SE	Time-series SE
-0.114443	0.611074	0.003865	0.053770

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.2518	-0.5622	-0.1235	0.3200	1.0877

differences between areas for other and reproduction

Mean	SD	Naive SE	Time-series SE
-0.498838	0.492757	0.003116	0.111526

Quantiles for each variable:

2.5%	25%	50%	75%	97.5%
-1.4371	-0.8622	-0.4516	-0.1489	0.4021