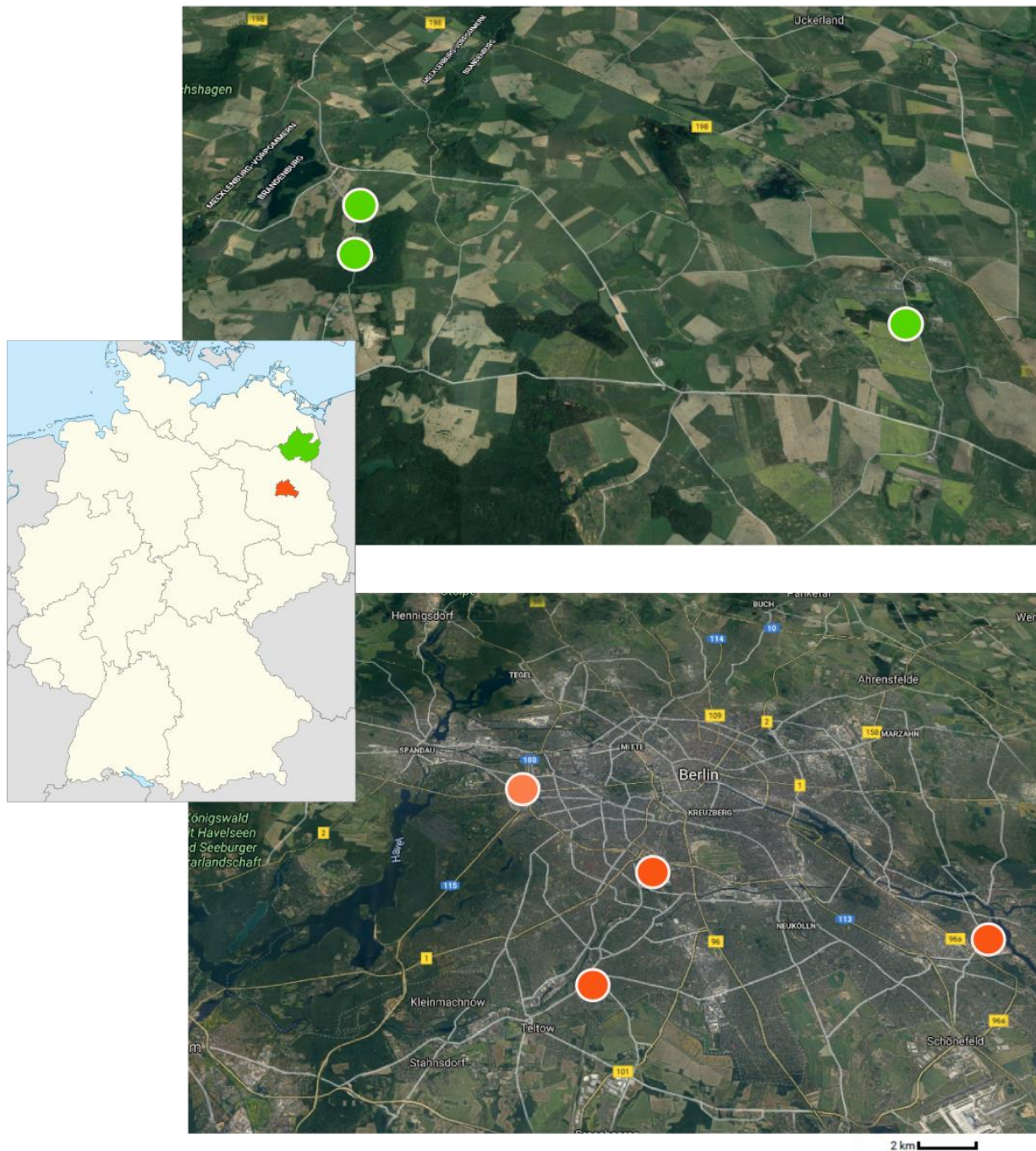
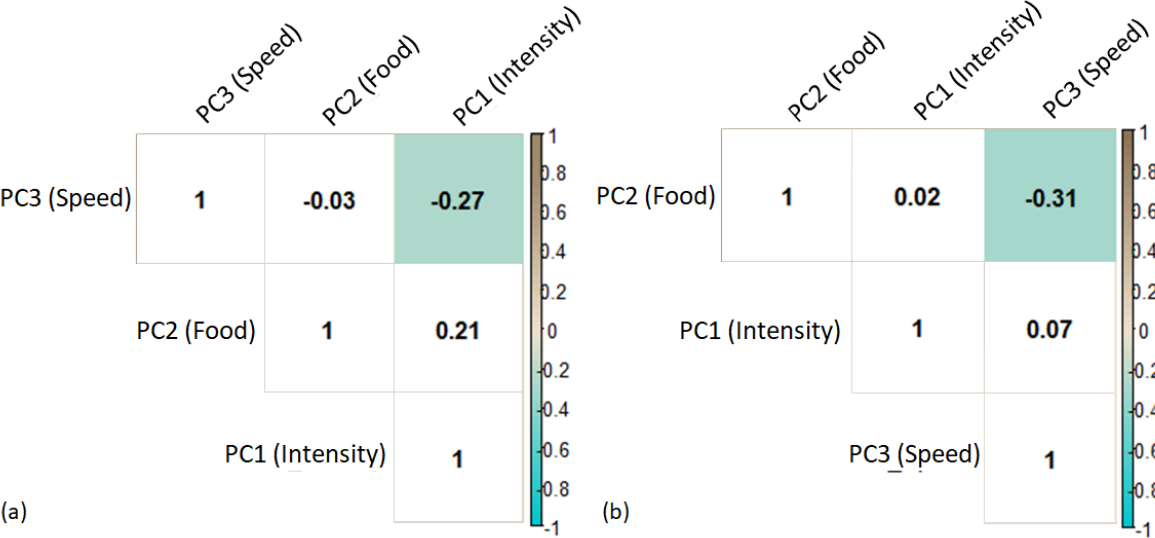


Supplementary Material



Supplementary Figure A1. Location and distances of the rural (green, upper) and urban (orange, lower) trapping sites (adapted from Mazza et al., 2020). Light orange = only common voles.



Supplementary Figure A2. Phenotypic correlations between composite variables for (a) 47 common voles (*Microtus arvalis*) and (b) 41 striped field mice (*Apodemus agrarius*). Colored background indicates a significant difference from zero.

Supplementary Table A1. Adjusted individual repeatabilities of behavioral responses to novelty for 47 common voles (*Microtus arvalis*) and 41 striped field mice (*Apodemus agrarius*) quantified in a battery of three tests (novel object, novel food, novel space). Shown are mean estimates and 95 % credibility intervals of the posterior distribution of the MCMCglmm output.

Variable	Common voles			Striped field mice		
	R_{adjusted}	CI lower	CI upper	R_{adjusted}	CI lower	CI upper
Latency NO	0.456	0.284	0.638	0.354	0.172	0.545
Latency NF	0.369	0.197	0.544	0.229	0.084	0.405
Latency NS	0.425	0.244	0.618	0.380	0.189	0.602
Duration NO	0.347	0.150	0.534	0.324	0.141	0.529
Duration NF	0.472	0.231	0.712	0.329	0.119	0.548
Duration NS	0.566	0.426	0.705	0.623	0.489	0.760
Frequency NO	0.581	0.430	0.711	0.610	0.453	0.740
Frequency NF	0.550	0.367	0.733	0.547	0.365	0.710
Frequency NS	0.589	0.457	0.726	0.629	0.492	0.763

Supplementary Table A2. Results of model comparisons between our 10 candidate models. Smaller AIC (Akaike Information Criterion) values are given to models that better fit the data. Models whose AIC values differ from that of the top model (ΔAIC) by more than 2 are considered to lack explanatory power relative to the top model. We also present the values for the Normed Fit Index (NFI) which represents the proportion in the improvement of the overall fit of a given hypothesized model compared to the independence model (Moiron et al., 2019). The Parsimonious Normed Fit Index (PNFI) is a modification of the NFI that takes parsimony of the model into account. (P)NFI values range from 0 (poor improvement) to 1 (perfect improvement). The minimum fit function (FMIN) describes how close the model-implied co-variances (i.e., those calculated based on the model parameter estimates), are to the actual co-variances calculated from the sample. Smaller FMIN values are given to models with the smallest discrepancy.

	Model	FMIN	χ^2	df	p	NFI	PNFI	AIC
Common voles	Model 0	0.314	48.92	36	0.074	0.000	0.000	2357.49
	Model 1	0.100	15.62	27	0.960	0.681	0.511	2342.20
	Model 2	0.088	13.75	24	0.952	0.406	0.479	2346.33
	Model 3	0.186	29.075	25	0.261	0.406	0.282	2359.65
	Model 4	0.093	14.52	26	0.966	0.703	0.508	2343.10
	Model 5	0.093	14.52	26	0.966	0.703	0.508	2343.10
	Model 6	Model did not converge						
	Model 7	Model did not converge						
	Model 8	0.065	10.17	24	0.994	0.751	0.521	2342.78
Striped field mice	Model 9	0.078	12.20	25	0.985	0.792	0.528	2342.75
	Model 0	0.298	47.63	36	0.093	0.000	0.000	2089.36
	Model 1	0.124	19.91	27	0.834	0.582	0.436	2079.64
	Model 2	0.030	4.78	24	1.000	0.640	0.600	2070.51
	Model 3	0.107	17.16	25	0.876	0.640	0.444	2080.89
	Model 4	0.030	4.79	26	1.000	0.899	0.650	2066.52
	Model 5	0.030	4.79	25	1.000	0.899	0.625	2068.52
	Model 6	0.022	3.46	24	1.000	0.927	0.618	2069.19
	Model 7	0.022	3.46	24	1.000	0.927	0.618	2069.19
	Model 8	Model did not converge						
	Model 9	0.088	14.09	24	0.945	0.704	0.47	2079.82

Supplementary Table A3. Model results composite scores (PC) describing responses to novelty in relation to area of origin (rural vs. urban), and test round for 47 common voles (*Microtus arvalis*) and 41 striped field mice (*Apodemus agrarius*). R_m reports the marginal R^2 value based on the fixed factors, R_c the conditional R^2 value including individual identity as a random factor. Reference levels are given in (). For statistically significant effects, p values are highlighted in bold.

	<i>Variable</i>	<i>Fixed factors</i>	<i>Estimate</i>	<i>SE</i>	<i>t/Z</i>	<i>P</i>	R^2_m	R^2_c
Common voles	<i>PC1</i> (Intensity)	Intercept	-1.03	0.32	-3.24	0.001		
		Origin (Urban)	-0.03	0.23	-0.13	0.896	0.13	0.31
		Test round	0.72	0.20	3.69	< 0.001		
	<i>PC2</i> (Speed, i.e. latency)	Intercept	1.57	0.31	5.10	0.000		
		Origin (Urban)	-0.46	0.19	-2.36	0.018	0.28	0.28
		Test round	-0.93	0.20	-4.73	< 0.001		
Striped field mice	<i>PC3</i> (Food)	Intercept	-0.25	0.30	-0.86	0.391		
		Origin (Urban)	-0.44	0.26	-1.69	0.090	0.07	0.52
		Test round	0.32	0.17	1.90	0.058		
	<i>PC1</i> (Intensity)	Intercept	0.93	0.25	3.78	0.000		
		Origin (Urban)	-0.30	0.29	-1.04	0.300	0.09	0.75
		Test round	-0.55	0.12	-4.75	< 0.001		
	<i>PC2</i> (Speed, i.e. latency)	Intercept	0.83	0.31	2.65	0.008		
		Origin (Urban)	-0.31	0.26	-1.20	0.229	0.08	0.38
		Test round	-0.47	0.18	-2.61	0.009		
	<i>PC3</i> (Food)	Intercept	-0.42	0.36	-1.18	0.240		
		Origin (Urban)	0.10	0.24	0.43	0.664	0.02	0.05
		Test round	0.26	0.22	1.17	0.243		

Supplementary Table A4 . Results from the *anova* comparison of random structure on the model fit. R_m reports the marginal R^2 value based on the fixed factors, R_c the conditional R^2 value including individual identity as a random factor. AIC: Akaike information criterion; BIC: Bayesian information criterion.

	<i>Variable</i>	<i>Model</i>	R^2_m	R^2_c	<i>Df</i>	<i>AIC</i>	<i>BIC</i>	<i>logLik</i>	<i>deviance</i>	X^2	<i>P</i>
Common voles	<i>PC3</i> (Food)	1 Site/ID	0.07	0.52	5	216.62	228.41	-103.310	206.620		
		1 ID	0.07	0.52	6	218.62	232.76	-103.310	206.620	0	1
	<i>PC1</i> (Intensity)	1 Site/ID	0.13	0.31	4	216.47	225.89	-104.230	208.470		
		1 ID	0.12	0.31	5	218.41	230.19	-104.200	208.410	0	1
	<i>PC2</i> (Speed, i.e. latency)	1 Site/ID	0.28	0.28	5	204.22	216.00	-97.111	194.220		
		1 ID	0.28	0.28	6	206.19	220.33	-97.097	194.190	0	1
Striped field mice	<i>PC1</i> (Intensity)	1 Site/ID	0.09	0.75	5	199.04	210.95	-94.520	189.040		
		1 ID	0.09	0.74	6	201.90	216.19	-94.948	189.900	0	1
	<i>PC2</i> (Speed, i.e. latency)	1 Site/ID	0.08	0.38	5	228.87	240.78	-109.440	218.870		
		1 ID	0.09	0.38	6	230.97	245.26	-109.490	218.970	0	1
	<i>PC3</i> (Food)	1 Site/ID	0.02	0.05	5	233.96	245.88	-111.980	223.960		
		1 ID	0.02	0.03	6	235.96	250.26	-111.980	223.960	0	1

Supplementary Table A5. Mean and standard deviation of variables measured for 47 common voles (*Microtus arvalis*) and 41 striped field mice (*Apodemus agrarius*) in a repeated battery of three novelty tests (novel object NO, novel food NF, novel space NS).

	Variable	All		Rural		Urban	
		Mean	SD	Mean	SD	Mean	SD
<i>Common voles</i>	Latency NO	783.9	2,174.5	793.4	1,545.5	774.5	2,681.9
	Duration NO	250.4	395.0	229.2	420.1	271.6	372.4
	Frequency NO	16.4	14.0	16.4	12.0	16.5	16.0
	Latency NF	783.8	2,069.0	546.4	965.9	1,021.2	2,761.4
	Duration NF	95.2	258.0	150.9	355.5	39.4	46.1
	Frequency NF	7.9	5.3	9.1	6.5	6.7	3.3
	Latency NS	1,172.4	2,174.0	1,213.5	1,616.7	1,131.3	2,638.1
	Duration NS	1,275.1	936.3	1,476.5	1,064.6	1,073.6	748.1
	Frequency NS	38.8	48.0	28.2	37.2	41.4	56.6
<i>Striped field mice</i>	Latency NO	60.2	284.1	41.8	191.2	90.8	395.6
	Duration NO	887.2	785.0	1,003.7	868.5	693.2	584.9
	Frequency NO	20.6	14.1	21.0	14.8	20.0	13.0
	Latency NF	88.0	416.7	99.9	506.8	68.3	196.2
	Duration NF	57.5	66.0	70.0	77.6	35.3	29.5
	Frequency NF	7.3	4.7	7.9	4.6	6.2	4.7
	Latency NS	231.1	1,115.8	228.4	1,182.9	235.7	1,013.4
	Duration NS	1,489.8	1,011.6	1,316.8	903.4	1,778.3	1,127.5
	Frequency NS	16.8	15.9	18.7	18.8	13.6	8.6