

Supplementary Tables for

Species' urbanization time but not present urban tolerance predicts avian fear responses towards human

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Figure S1. Interactive map of bird flight initiation distance (FID) observations across urban green spaces in Prague, Czechia. Each point represents a unique sampling location and point (ID.Area_Point; e.g. 47_1 means locality number 47 and point number 1 within this locality), with colour indicating site type (green = park, black = cemetery). Popups display the location name, site type, and the number of individual observations per point. **For interactive map, see Additional file 1: Fig. S1.** The lower picture shows only preview.

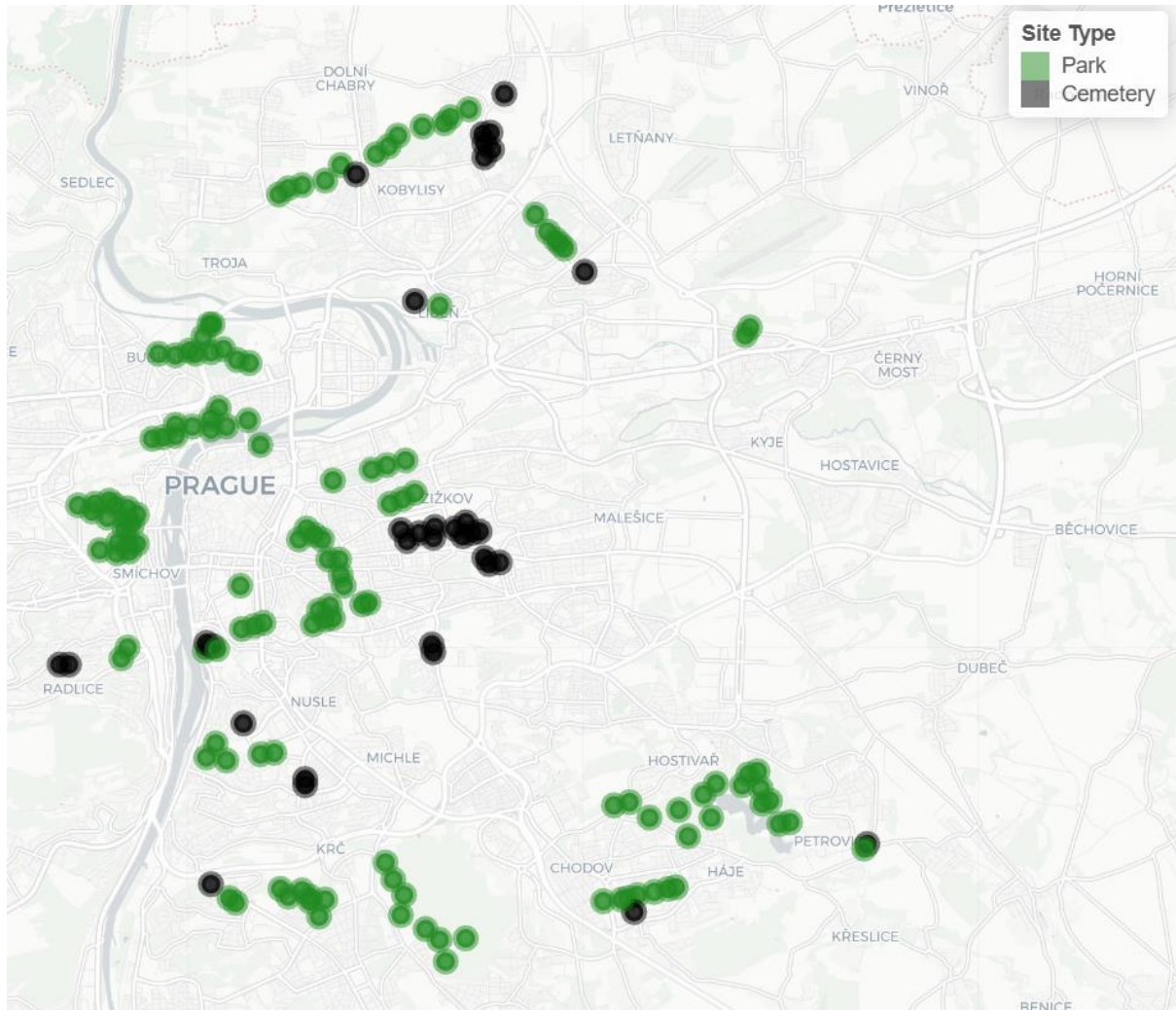


Table S1. Results of a multi-predictor Bayesian phylogenetically informed regression model examining variation in flight initiation distance (response variable) among urban bird species in Prague (Czech Republic) after excluding data from four large peripheral parks. The model included a categorical predictor representing the year of urbanization and urban tolerance (breeding commonness), and a suite of covariates including starting distance (log10-transformed), body mass (log10-transformed), flock size (log10-transformed), time of day (hour), date, year, ambient temperature, human presence (number of people counted during each trial session), and urbanization level (core vs suburban). Species identity together with phylogenetic covariance matrix and locality were included as random effects. Parameter estimates (posterior means) are presented with their 95% credible intervals (2.5% and 97.5% CI, respectively) and Bayesian *p*-values (*p*MCMC). Marginal $R^2 = 0.236$, conditional $R^2 = 0.572$. The analysis was based on 3,738 observations from 61 bird species. Statistically significant results are highlighted in bold.

Predictor	Posterior mean	2.5% CI	97.5% CI	pMCMC
(Intercept)	0.875	0.691	1.081	<0.001
Urbanization time (1901–1945)	0.003	-0.094	0.100	0.956
Urbanization time (≥ 1946)	0.209	0.057	0.336	0.004
Urban tolerance	-0.003	-0.034	0.031	0.877
Starting distance	0.063	0.054	0.072	<0.001
Body mass	0.061	-0.013	0.138	0.094
Flock size	0.006	-0.003	0.015	0.229
Hour	-0.012	-0.025	0.001	0.077
Julian date	0.001	-0.001	0.002	0.383
Year	-0.021	-0.033	-0.009	0.001
Temperature	-0.006	-0.016	0.005	0.285
Human presence	0.004	-0.006	0.015	0.447
Urban level (suburban)	0.055	-0.014	0.125	0.126

Table S2. Results of a multi-predictor Bayesian phylogenetically informed regression model examining variation in flight initiation distance (response variable) among urban bird species in Prague (Czech Republic). The model included a categorical predictor representing the year of urbanization and urban tolerance (night-time light), and a suite of covariates including starting distance (log10-transformed), body mass (log10-transformed), flock size (log10-transformed), time of day (hour), date, year, ambient temperature, and human presence (number of people counted during each trial session). Species identity together with phylogenetic covariance matrix and locality were included as random effects. Parameter estimates (posterior means) are presented with their 95% credible intervals (2.5% and 97.5% CI, respectively) and Bayesian *p*-values (*p*MCMC). Marginal $R^2 = 0.209$, conditional $R^2 = 0.555$. The analysis was based on 4,407 observations from 63 bird species. Statistically significant results are highlighted in bold.

Predictor	Posterior mean	2.5% CI	97.5% CI	pMCMC
(Intercept)	0.874	0.682	1.089	<0.001
Urbanization time (1901–1945)	-0.020	-0.122	0.077	0.677
Urbanization time (≥ 1946)	0.196	0.054	0.327	0.004
Artificial light at night (ALAN)	-0.047	-0.096	0.009	0.084
Starting distance	0.067	0.059	0.075	<0.001
Body mass	0.060	-0.010	0.124	0.078
Flock size	0.005	-0.003	0.014	0.202
Hour	-0.015	-0.028	-0.003	0.020
Julian date	0.000	-0.001	0.002	0.436
Year (continuous)	-0.020	-0.032	-0.009	0.002
Temperature	-0.006	-0.016	0.004	0.217
Human presence	0.003	-0.009	0.012	0.632
Urban level (suburban)	0.060	0.002	0.120	0.046

Table S3. Results of a multi-predictor Bayesian phylogenetically informed regression model examining variation in flight initiation distance (response variable) among urban bird species in Prague (Czech Republic). The model included following predictors: year of urbanization (continuous), urban tolerance (breeding commonness), and a suite of covariates including starting distance (log10-transformed), body mass (log10-transformed), flock size (log10-transformed), time of day (hour), date, year, ambient temperature, human presence (number of people counted during each trial session), and urbanization level (core vs suburban). Species identity together with phylogenetic covariance matrix and locality were included as random effects. Parameter estimates (posterior means) are presented with their 95% credible intervals (2.5% and 97.5% CI, respectively) and Bayesian *p*-values (*p*MCMC). Marginal $R^2 = 0.150$, conditional $R^2 = 0.541$. The analysis was based on 4,420 observations from 68 bird species. Statistically significant results are highlighted in bold.

Predictor	Posterior mean	2.5% CI	97.5% CI	pMCMC
(Intercept)	0.948	0.765	1.145	<0.001
Urbanization time (continuous)	0.036	-0.011	0.085	0.140
Urban tolerance	-0.016	-0.051	0.014	0.337
Starting distance	0.067	0.059	0.076	<0.001
Body mass	0.071	0.005	0.139	0.042
Flock size	0.005	-0.003	0.013	0.233
Hour	-0.015	-0.027	-0.003	0.016
Julian date	0.000	-0.001	0.002	0.423
Year (continuous)	-0.020	-0.032	-0.009	<0.001
Temperature	-0.007	-0.017	0.002	0.166
Human presence	0.003	-0.008	0.013	0.620
Urban level (suburban)	0.058	-0.001	0.120	0.061

Table S4. Summary table showing species means for flight initiation distance (FID) (m), its standard deviation (SD) (m), and sample size per each species. Table divides species based on their urbanization time (Period).

Species	N	Mean FID (m)	SD FID (m)
≥1946			
<i>Accipiter nisus</i>	2	51.5	2.12
<i>Alopochen aegyptiaca</i>	1	18	NA
<i>Ardea cinerea</i>	15	27.73	13.2
<i>Aythya fuligula</i>	9	16.89	1.69
<i>Buteo buteo</i>	4	56.05	23.36
<i>Columba palumbus</i>	938	10.68	7.53
<i>Cygnus olor</i>	5	15.4	8.2
<i>Dendrocopos medius</i>	5	11.11	8.62
<i>Falco tinnunculus</i>	3	37.77	17.96
<i>Mergus merganser</i>	1	39	NA
<i>Pica pica</i>	421	16.39	10.4
<i>Streptopelia decaocto</i>	53	10.85	6.23
<i>Tachybaptus ruficollis</i>	1	43	NA
<i>Turdus pilaris</i>	24	8.18	4.79
1901–1945			
<i>Acrocephalus arundinaceus</i>	1	3.61	NA
<i>Aegithalos caudatus</i>	34	4.62	2.03
<i>Carduelis carduelis</i>	11	9.62	4.75
<i>Carduelis chloris</i>	2	9.53	2.08
<i>Carduelis spinus</i>	1	13	NA
<i>Certhia brachydactyla</i>	49	4.93	2.43
<i>Certhia familiaris</i>	5	7.32	0.85
<i>Coccothraustes coccothraustes</i>	7	15.15	3.91
<i>Corvus corone</i>	6	35.31	18.52
<i>Cuculus canorus</i>	1	15.23	NA
<i>Dendrocopos major</i>	116	13.32	8.68
<i>Dryocopus martius</i>	7	24.53	12.54
<i>Emberiza citrinella</i>	2	9	4.24
<i>Erithacus rubecula</i>	86	8.27	5.12
<i>Ficedula albicollis</i>	7	9.45	2.05
<i>Ficedula hypoleuca</i>	2	7.67	0.55
<i>Fulica atra</i>	6	5.33	1.63
<i>Garrulus glandarius</i>	142	11.59	8.41
<i>Oriolus oriolus</i>	3	21.93	4.58
<i>Parus caeruleus</i>	93	4.86	2.36
<i>Parus palustris</i>	2	10.92	7.19
<i>Passer montanus</i>	20	7.23	3.55
<i>Phasianus colchicus</i>	1	15	NA
<i>Phylloscopus collybita</i>	62	6.69	2.97
<i>Phylloscopus sibilatrix</i>	16	9.68	2.56

<i>Phylloscopus trochilus</i>	5	6.05	2.11
<i>Prunella modularis</i>	1	19.21	NA
<i>Regulus ignicapilla</i>	2	4.3	0.99
<i>Sitta europaea</i>	83	4.94	2.59
<i>Sturnus vulgaris</i>	165	14.34	7.6
<i>Sylvia atricapilla</i>	150	7.06	3.26
<i>Sylvia borin</i>	3	7.55	1.75
<i>Troglodytes troglodytes</i>	33	8.81	2.95
<i>Turdus philomelos</i>	60	10.77	7.87
<i>Turdus viscivorus</i>	5	12.79	9.14
≤1900			
<i>Anas platyrhynchos</i>	98	9.52	9.5
<i>Columba livia</i>	307	4.1	3.87
<i>Corvus frugilegus</i>	12	23.36	19.58
<i>Corvus monedula</i>	158	9.54	7.4
<i>Fringilla coelebs</i>	85	7.04	3.94
<i>Gallinula chloropus</i>	21	14.48	6.76
<i>Hippolais icterina</i>	1	9.49	NA
<i>Luscinia megarhynchos</i>	27	4.93	1.61
<i>Motacilla alba</i>	4	13.55	5.95
<i>Motacilla cinerea</i>	7	16.46	4.81
<i>Muscicapa striata</i>	2	11	1.41
<i>Parus major</i>	312	5.28	3.14
<i>Passer domesticus</i>	2	8.02	4.27
<i>Phoenicurus ochruros</i>	26	11.05	5.45
<i>Phoenicurus phoenicurus</i>	93	9.96	4.22
<i>Picus viridis</i>	65	20.38	12.46
<i>Sylvia communis</i>	10	9.48	3.92
<i>Sylvia curruca</i>	17	5.87	1.83
<i>Turdus merula</i>	502	9.74	8.47