

Shorter headed dogs, visually cooperative breeds, younger and playful dogs form eye contact faster with an unfamiliar human

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Supplementary information

Supplementary Table S1. Name, breed, breed function, *cephalic index* value, sex (and sexual status), age of the dogs and the experimenter's monogram, who conducted the test.

	Dog	Breed	Cephalic index	Breed function	Age (month)	Sex (i=intact)	Experimenter
1	Áfonya1	Mixed	51.54	Mixed	138.8	Female	ZB
2	Áfonya2	Mixed	48.40	Mixed	51.2	Female	VH
3	Alec	Labrador Retriever	53.89	Cooperative	126.1	Male (i)	ZB
4	Alfi	Belgian Shepherd Dog (Tervuren)	48.41	Cooperative	55.7	Male	AD
5	Alice	Mixed	56.79	Mixed	163.4	Female	ZB
6	Andi	Mixed	55.18	Mixed	79.3	Female (i)	BS
7	Angelo	Rhodesian Ridgeback	48.38	Non-cooperative	104.5	Male	DS
8	Apache	Border Collie	57.66	Cooperative	137.9	Male (i)	DS
9	Archibald	Mixed	47.71	Mixed	167.4	Male (i)	ZB
10	Bajsz	Mixed	44.93	Mixed	131.3	Female (i)	RB
11	Balu	Mixed	53.79	Mixed	73.3	Male	AD
12	Bambi	Mixed	53.17	Mixed	96.9	Female	AE
13	Barbason	Whippet	48.91	Non-cooperative	110.4	Male	DS
14	Barka	English Cocker Spaniel	45.66	Cooperative	76.9	Male (i)	AE
15	Bejgli	Beagle	58.79	Non-cooperative	45.3	Male	BS
16	Bijou	Whippet	48.18	Non-cooperative	142.8	Female	ZB
17	Bizsu	Labrador Retriever	56.16	Cooperative	98.7	Female	RB
18	Bob	Mixed	61.50	Mixed	43.8	Male	ZB
19	Bodor	Mixed	54.31	Mixed	140.5	Male	SM
20	Bodza1	Giant Schnauzer	47.45	Non-cooperative	113.6	Male	SM
21	Bodza2	Golden Retriever	57.56	Cooperative	115.0	Male (i)	VH
22	Bogyó1	Mixed	56.14	Mixed	135.4	Male	ZB
23	Bogyó2	Beagle	61.47	Non-cooperative	75.1	Male (i)	AE
24	Borisz	Whippet	48.42	Non-cooperative	130.2	Male (i)	BS
25	Brutus	Mixed	59.25	Mixed	134.7	Male	DS
26	Bucka	Mixed	49.24	Mixed	124.7	Female	SM
27	Buddha	Bouvier des Flandres	46.00	Cooperative	36.4	Male (i)	AD
28	Bukó	Mixed	55.92	Mixed	101.7	Male	VH
29	Creasy	Bernese Mountain Dog	52.19	Non-cooperative	139.9	Male	DS
30	Csingi	Mixed	56.66	Mixed	106.5	Female	SM
31	Csoki	German Shorthaired Pointer	49.51	Cooperative	132.5	Female (i)	SM
32	Csutka	Mixed	48.81	Mixed	59.1	Female	ZB
33	Cuki	Mixed	49.77	Mixed	80.8	Female	ZB
34	Dancey	Mixed	58.70	Mixed	75.9	Female (i)	BS
35	Dása	Mixed	52.58	Mixed	94.9	Female	DS
36	Delko	Doberman Pinscher	43.47	Non-cooperative	58.1	Male	BS
37	Dexter	Mixed	54.11	Mixed	98.7	Male	SM
38	Dolli	Boxer	67.47	Non-cooperative	43.2	Female	AD
39	Dolores	Mixed	54.36	Mixed	42.5	Female	BS
40	Dominó	Border Collie	55.11	Cooperative	128.6	Female	RB
41	Dorell	Dalmatian	49.54	Non-cooperative	43.8	Male	BS
42	Dóme	English Cocker Spaniel	47.53	Cooperative	59.8	Male	AD
43	Elza	German Wirehaired Pointer	48.92	Cooperative	138.0	Female	ZB
44	Fickó	Mixed	43.75	Mixed	67.1	Male	VH
45	Frida	Basset Hound	46.28	Non-cooperative	37.3	Female	AD
46	Frutti	Mixed	52.23	Mixed	95.7	Female	SM
47	Füge	Mixed	52.71	Mixed	75.7	Female	AE
48	Füles	Mixed	48.38	Mixed	174.5	Female	BS
49	Füli	Mixed	51.47	Mixed	163.6	Male	DS
50	Fülöp	Mixed	53.17	Mixed	123.0	Male	ZB
51	Gonzó	Siberian Husky	54.85	Non-cooperative	130.1	Male	BS
52	Hetty	Cavalier King Charles Spaniel	67.58	Cooperative	126.8	Female	ZB
53	Huba	Mixed	48.34	Mixed	76.5	Male (i)	ZB
54	Jackson	Doberman Pinscher	45.19	Non-cooperative	63.3	Male (i)	VH
55	Janda	Mixed	58.16	Mixed	137.1	Male	DS
56	Jenna	American Pit Bull Terrier	56.72	Non-cooperative	53.6	Female	BS
57	Jollie	Vizsla	55.33	Cooperative	79.4	Female	ZB
58	Kai	Mixed	50.77	Mixed	37.6	Male (i)	AD
59	Káldor	Mixed	50.45	Mixed	106.2	Male (i)	DS
60	Kiki	Border Collie	55.57	Cooperative	36.9	Female (i)	ZB
61	Knut	Mixed	67.99	Mixed	134.8	Male	DS
62	Koda	Siberian Husky	54.49	Non-cooperative	40.3	Male (i)	ZB
63	Kópé1	Mixed	52.10	Mixed	147.9	Male	VH
64	Kópé2	Cairn Terrier	66.39	Non-cooperative	122.9	Male	SM

65	Kópé3	Transylvanian Hound	49.44	Non-cooperative	62.3	Male	BS
66	Kuszi	Mixed	52.51	Mixed	143.1	Female	BS
67	Lajka	Mixed	49.85	Mixed	35.8	Female	AD
68	Lara	Border Collie	56.80	Cooperative	33.5	Female	ZB
69	Letty	Mixed	48.32	Mixed	57.7	Female	AD
70	Lisa	Vizsla	50.73	Cooperative	162.6	Female	ZB
71	Liza	Vizsla	50.50	Cooperative	163.4	Female	DS
72	Lizi	Border Collie	60.26	Cooperative	106.5	Female	BS
73	Luna	Mixed	57.50	Mixed	98.7	Female	VH
74	Lupita	Border Collie	54.52	Cooperative	122.6	Female	DS
75	Maci	Mixed	58.07	Mixed	104.0	Male	ZB
76	Maja	Mixed	49.43	Mixed	127.6	Female	RB
77	Manó	Mixed	52.74	Mixed	96.2	Female	VH
78	Mara	Shetland Sheepdog	45.01	Cooperative	40.5	Female	ZB
79	Mazsi	Mixed	53.70	Mixed	75.6	Female	ZB
80	Merlin	Labrador Retriever	56.27	Cooperative	97.0	Male	ZB
81	Metró	Mixed	51.27	Mixed	109.1	Male	DS
82	Mira	Border Collie	57.69	Cooperative	144.1	Female	BS
83	Mixi	Mixed	53.86	Mixed	39.1	Female	VH
84	Molly	English Cocker Spaniel	44.75	Cooperative	58.9	Female	AD
85	Momo	American Pit Bull Terrier	60.51	Non-cooperative	37.8	Male (i)	AD
86	Monti	Boxer	74.68	Non-cooperative	108.2	Male	DS
87	Móric	Border Collie	54.32	Cooperative	150.8	Male	BS
88	Néró	Labrador Retriever	50.82	Cooperative	143.0	Male (i)	BS
89	Niké	Border Collie	57.76	Cooperative	152.3	Female	BS
90	Nina	Mixed	57.43	Mixed	43.9	Female (i)	AE
91	Nova	Mixed	44.83	Mixed	39.4	Male (i)	ZB
92	Olivér	Mixed	69.84	Mixed	98.9	Male	DS
93	Panka1	Mixed	48.81	Mixed	147.3	Female	BS
94	Panka2	Vizsla	50.02	Cooperative	122.5	Female	ZB
95	Pedro	Poodle	50.66	Cooperative	79.7	Male (i)	BS
96	Pepi	Mixed	56.73	Mixed	160.9	Male (i)	RB
97	Perec	Border Collie	49.16	Cooperative	31.4	Male	AE
98	Pinky	Cairn Terrier	70.84	Non-cooperative	105.3	Female	ZB
99	Pletyka	Mudi	59.70	Cooperative	138.7	Female	ZB
100	Queeny	Border Collie	55.35	Cooperative	123.2	Female	BS
101	Roger	Border Collie	51.22	Cooperative	137.2	Male	DS
102	Roni	Shetland Sheepdog	44.49	Cooperative	93.4	Male	SM
103	Rozi1	Border Collie	58.12	Cooperative	132.1	Female	BS
104	Rozi2	Mixed	55.22	Mixed	100.4	Female	SM
105	Rudi	Vizsla	55.32	Cooperative	127.9	Male	BS
106	Sunny	Mixed	53.52	Mixed	36.5	Female	ZB
107	Szamóca	Whippet	47.10	Non-cooperative	127.3	Female	RB
108	Tappancs	Mixed	62.61	Mixed	120.4	Male	DS
109	Tapsi	Whippet	47.39	Non-cooperative	119.7	Male	ZB
110	Tashi	Tibetan Terrier	58.83	Cooperative	111.2	Male	ZB
111	Tasli	Mixed	53.75	Mixed	122.6	Female	ZB
112	Teo	German Shepherd Dog	49.04	Cooperative	131.7	Male	BS
113	Terka	Wirehaired Vizsla	45.16	Cooperative	69.7	Female (i)	ZB
114	Titi	Tibetan Terrier	61.42	Cooperative	137.3	Male (i)	RB
115	Tony	Beagle	55.32	Non-cooperative	96.3	Male (i)	DS
116	Vackor	Puli	57.74	Cooperative	128.6	Male	BS
117	Velvet	Whippet	49.73	Non-cooperative	142.1	Male	VH
118	Vilja	Airedale Terrier	52.11	Non-cooperative	113.2	Female	DS
119	Viola	Mixed	54.55	Mixed	41.8	Female	ZB
120	Zazi	Mixed	62.29	Mixed	150.1	Female (i)	SM
121	Zeller	Airedale Terrier	48.28	Non-cooperative	43.8	Female (i)	VH
122	Zenit	Shetland Sheepdog	56.18	Cooperative	122.1	Female (i)	DS
123	Zserbó1	Mixed	53.56	Mixed	108.4	Male	ZB
124	Zserbó2	Vizsla	50.83	Cooperative	111.6	Male	AE
125	Zsömi	Mixed	47.15	Mixed	135.2	Female	RB

Supplementary Table S2. VIF scores of the independent variables.

Independent variables	VIF score	Df
Cephalic index	1.016	1
Breed function group	1.061	2
Age	1.421	1
Greeting behaviour	1.269	1
Playfulness	1.547	1
Trial number	1.008	14

Details of model selection

We also added the full script of the analysis (Bognar_et_al_EyeContact_ms_suppl_analysis.pdf) as supplementary material.

Supplementary Table S3. Results of Mixed Effects Cox Regression Models' bottom-up model selection.

Models	loglik	Chisq	Df	P(> Chi)
Nullmodel	-10920			
Nullmodel+ Cephalic index	-10918	3.005	1	0.083
Nullmodel + Breed group	-10918	3.729	2	0.155
Nullmodel + Age	-10915	9.516	1	0.002
Nullmodel + Greeting	-10921	2.411	1	0.121
Nullmodel + Playfulness	-10920	1.375	1	0.241
Nullmodel + Trial number	-10866	108.23	14	< 0.001
Nullmodel + Trial number + Cephalic index	-10864	3.223	1	0.073
Nullmodel + Trial number + Breed group	-10861	9.753	2	0.008
Nullmodel + Trial number + Age	-10864	3.676	1	0.055
Nullmodel + Trial number + Greeting	-10866	1.294	1	0.255
Nullmodel + Trial number + Playfulness	-10870	8.369	1	0.004
Nullmodel + Trial number + Breed group + Cephalic index	-10864	6.449	1	0.011
Nullmodel + Trial number + Breed group + Age	-10856	9.963	1	0.002
Nullmodel + Trial number + Breed group + Greeting	-10864	6.870	1	0.009
Nullmodel + Trial number + Breed group + Playfulness	-10865	7.973	1	0.005
Nullmodel + Trial number + Breed group + Age + Cephalic index	-10851	10.066	1	0.002
Nullmodel + Trial number + Breed group + Age + Greeting	-10858	3.757	1	0.053
Nullmodel + Trial number + Breed group + Age + Playfulness	-10858	3.645	1	0.056
Nullmodel + Trial number + Breed group + Age + Cephalic index + Greeting	-10852	2.780	1	0.095
Nullmodel + Trial number + Breed group + Age + Cephalic index + Playfulness	-10852	2.883	1	0.090
Nullmodel + Trial number + Breed group + Age + Cephalic index + Playfulness + Greeting	-10853	2.214	1	0.137

Although at the stage of the bottom-up model selection when we added Playfulness to the model, the statistic indicated a trend for worsening our model, in the end we decided to add it anyway because the difference is not significant, but Playfulness has a significant impact on our examined variable. Unlike Greeting behaviour, which had no effect.

Supplementary Table S4. Results of Binomial Generalized Linear Models' AIC based model selection for Greeting behaviour (with "dredge" function)

Intercept	Cephalic index	Breed group	Age	df	loglik	AICc	delta	weight
1.313			-0.010	2	-82.864	169.8	0.00	0.263
2.032		+	-0.011	4	-80.787	169.9	0.08	0.252
-0.065	0.027		-0.010	3	-82.507	171.2	1.39	0.131
0.528	0.029	+	-0.012	5	-80.367	171.2	1.41	0.130
0.339				1	-84.871	171.8	1.95	0.099
0.802		+		3	-83.315	172.8	3.00	0.059
-0.576	0.017			2	-84.717	173.5	3.71	0.041
-0.200	0.019	+		4	-83.131	174.6	4.77	0.024

Supplementary Table S5. Results of Binomial Generalized Linear Models' AIC based model selection for Playfulness (with “dredge” function)

Intercept	Cephalic index	Breed group	Age	df	loglik	AICc	delta	weight
1.867			-0.019	2	-78.693	161.5	0.00	0.488
2.508		+	-0.021	4	-77.229	162.8	1.31	0.254
1.768	0.002		-0.019	3	-78.691	163.6	2.10	0.171
2.274	0.005	+	-0.021	5	-77.219	164.9	3.46	0.087
-0.080				1	-86.543	175.1	13.64	0.001
0.739	-0.015			2	-86.416	176.9	15.45	0.000
0.191		+		3	-85.861	177.9	16.44	0.000
0.974	-0.015	+		4	-85.745	179.8	18.34	0.000