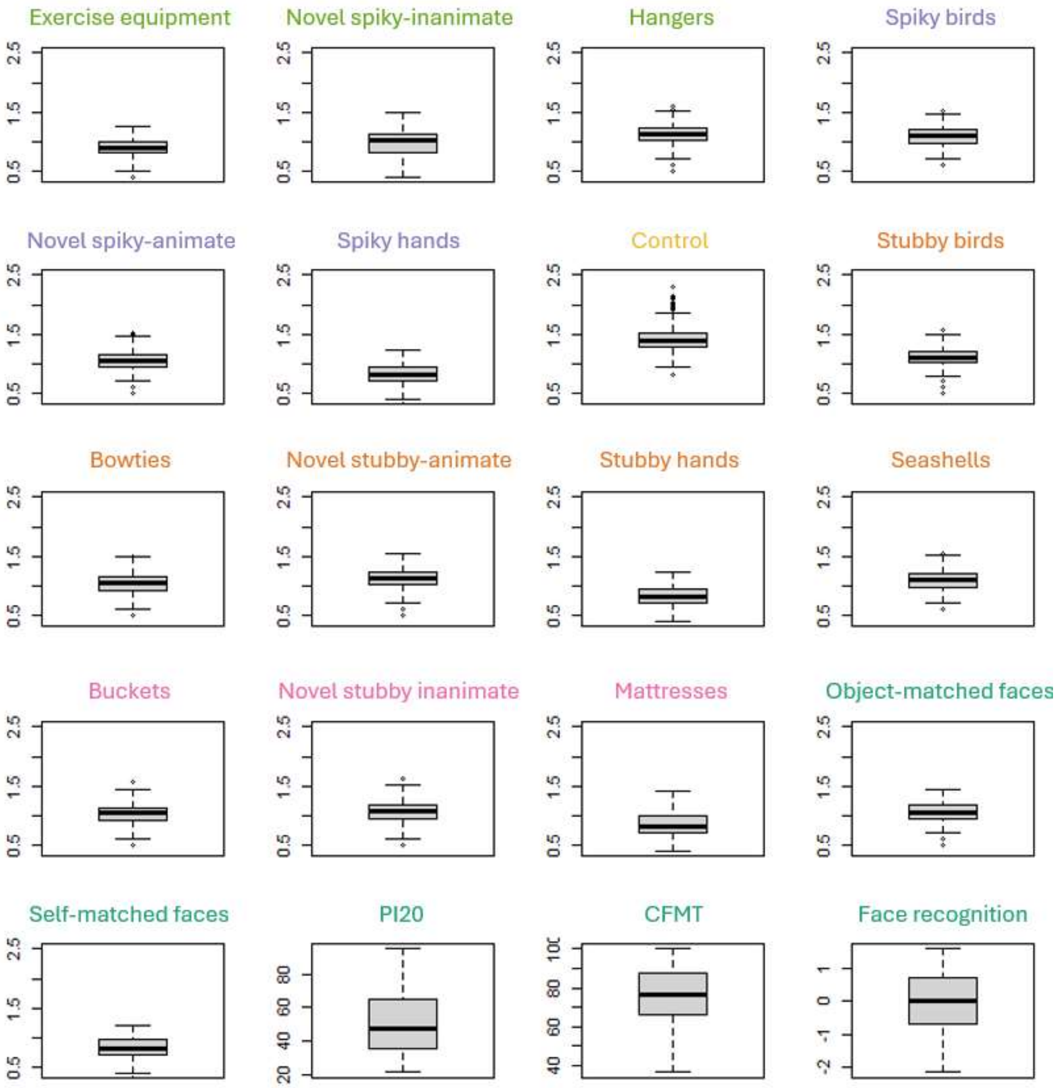
Supplementary Information

Supplementary figure s1 shows the distribution of foraging ability for all foraging conditions and for face recognition ability.

Supplementary figure s1

Boxplot showing the distribution of foraging and face recognition (N = 511).

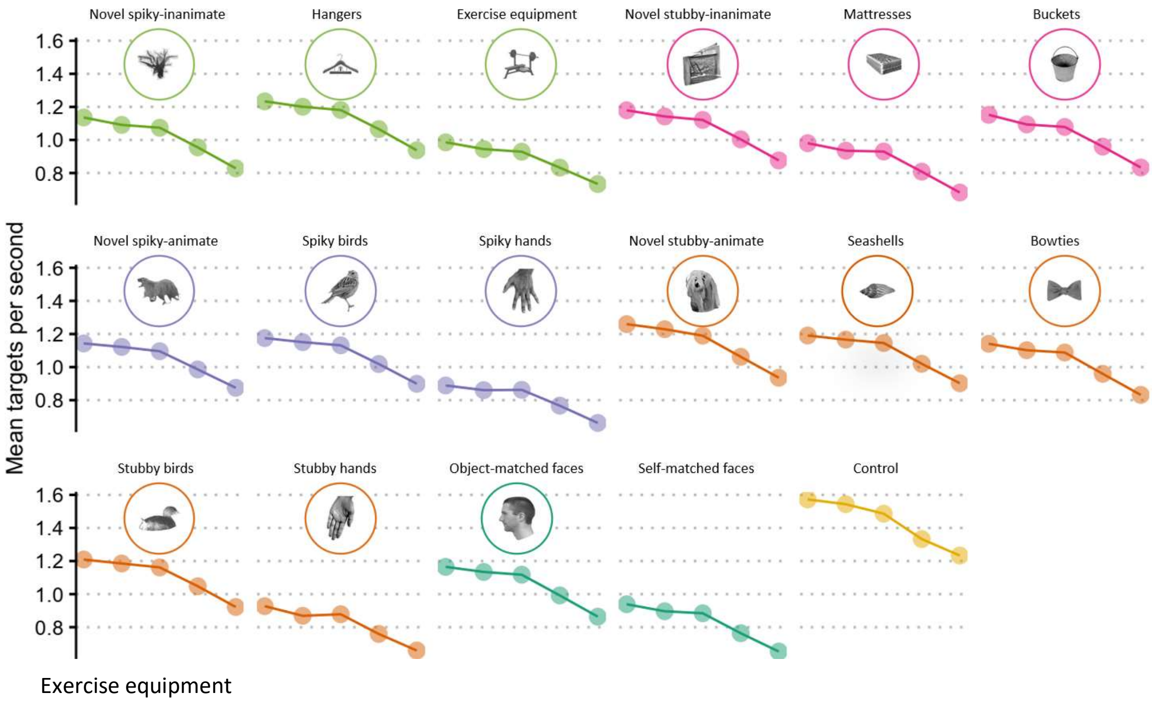


Note: Foraging performance is shown as median targets per second. 20-item prosopagnosia index (PI20) scores can range from 20 (no reported problems with faces) to 100 (most severe problems with faces). Cambridge Face Memory Test (CFMT) scores are in percent correct; chance level performance is 33%. *Face recognition scores are in arbitrary units (scores from PI20 and CFMT were z-scored, the z-score of PI20 was negated, and the mean of these were taken).*

Supplementary figures s2 and s3 show foraging performance by age and education, respectively. Foraging performance decreased with age for all conditions and increased with educational level for all conditions except control trials.

Supplementary figure s2

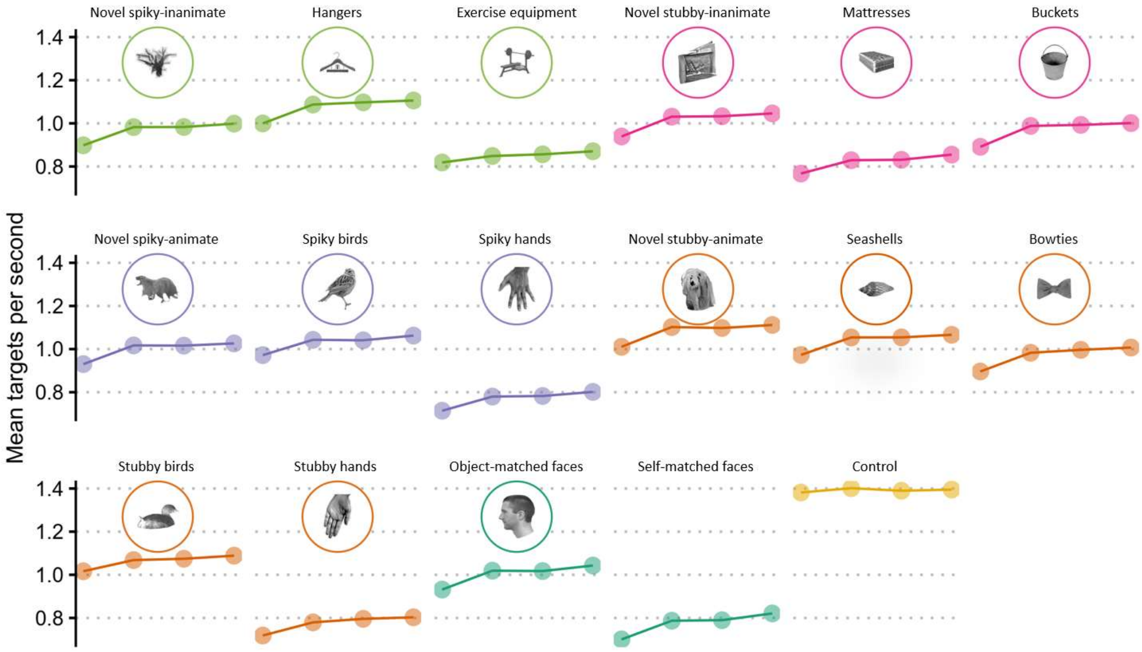
Foraging by age



Note: The five dots in each subplot represent the five age groups. Foraging performance declined with age for all trial types.

Supplementary figure s3

Foraging by education



Note: The four dots in each subplot represent the four educational levels. Foraging performance increased with educational level, with the notable exception of control foraging.

Supplementary table s1

Zero-order correlations between conditions

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	--	.83	.82	.83	.82	.78	.67	.83	.81	.82	.77	.82	.83	.83	.79	.79	.72	.23
2		--	.87	.86	.86	.82	.71	.86	.87	.87	.79	.86	.86	.88	.82	.84	.76	.29
3			--	.88	.90	.77	.80	.90	.89	.91	.78	.91	.89	.90	.82	.87	.73	.25
4				--	.87	.78	.76	.89	.86	.89	.79	.88	.86	.88	.82	.86	.75	.25
5					--	.78	.77	.88	.86	.90	.78	.88	.86	.89	.81	.87	.76	.29
6						--	.63	.78	.79	.79	.80	.78	.77	.81	.77	.76	.71	.21
7							--	.81	.74	.82	.58	.78	.73	.76	.65	.77	.60	.16
8								--	.87	.90	.77	.90	.88	.89	.82	.87	.75	.26
9									--	.89	.81	.89	.88	.88	.84	.86	.78	.29
10										--	.78	.90	.89	.90	.81	.89	.79	.28
11											--	.81	.79	.81	.79	.77	.75	.27
12												--	.89	.89	.83	.86	.76	.29
13													--	.89	.83	.86	.77	.30
14														--	.83	.86	.75	.27
15															--	.80	.75	.28
16																--	.84	.36
17																	--	.46
18																		--

Note: 1. Spiky inanimate-looking exercise equipment; 2. Spiky inanimate-looking novel objects; 3. Spiky inanimate-looking hangers; 4. Spiky animate-looking birds; 5. Spiky animate-looking novel objects; 6. Spiky animate-looking hands; 7. Control foraging; 8. Stubby animate-looking birds; 9. Stubby animate-looking bowties; 10. Stubby animate-looking novel objects; 11. Stubby animate-looking hands; 12. Stubby animate-looking seashells; 13. Stubby inanimate-looking buckets; 14. Stubby inanimate-looking novel objects; 15. Stubby inanimate-looking mattresses; 16. Stubby animate-looking object-matched faces; 17. Stubby animate-looking self-matched faces; 18. Face recognition (aggregate of PI20 and CFMT).

Supplementary table s2

Association between face discrimination (object-matched faces) and discrimination of stubby animate-looking objects using ridge regression

	Hypothesis 1: Novel	Hypothesis 2: Familiar	
Factor	b-value	b-value	Models
Intercept	0.142	0.105	M1
Age	-0.012	-0.009	
Gender	0.006	0.010	
Education	0.009	0.005	
Control foraging	0.094	0.088	
Novel spiky-inanimate	0.143	-	
Hanger spiky-inanimate	-	0.106	
Exer. eq. spiky-inanimate	-	0.047	
Novel stubby-inanimate	0.154	-	
Bucket stubby-inanimate	-	0.106	
Mattr. stubby-inanimate	-	0.052	
Novel spiky-animate	0.208	-	
Bird spiky-animate	-	0.118	
Hand spiky-animate	-	0.040	
Novel stubby-animate	0.234	-	M1 & M2
Bird stubby-animate	-	0.111	
Hand stubby-animate	-	0.074	
Bowtie stubby-animate	-	0.083	
Seashell stubby-animate	-	0.080	

Note: The table shows ridge regression models for preregistered hypotheses 1 and 2. Dependent variable is face discrimination ability (object-matched faces). Regressions are run separately for novel objects and familiar objects. In both cases, M1 includes all factors except for foraging for stubby animate-looking objects, and M2 includes all factors, including foraging for stubby animate-looking objects. For novel objects, M2: $R^2 = 0.819$, with a change from the M1 model without stubby animate-looking objects $\Delta R^2 = 0.010$. For familiar objects, M2: $R^2 = 0.836$ with a change from the M1 model without stubby animate-looking objects $\Delta R^2 = 0.005$. B-values are unstandardized regression coefficients.

A large part of the variance in face discrimination ability seems to be explained by background variables and a general object perception factor, with stubby animate-looking stimuli improving the model by about 1%. The added explanatory value of the model is significant, but not large. To determine whether this improvement of the model was due to the stimuli being stubby animate-looking or solely to the fact that we were adding another predictor to the model, we decided to redo our hierarchical regressions, adding performance for stimuli from three different quadrants of object space to the model in step 3, and adding performance for stimuli from the left-out quadrant in step 4. The results can be seen in supplementary table s3, which displays the change in R^2 between steps 3 and 4 in the original hierarchical regressions, where performance for stubby animate-looking stimuli was added to the models in step 4, and the three alternative regressions where performance for each of the other quadrants was added at step 4. For both novel and familiar objects, adding the stubby animate-looking performance to the regression in step 4 has the largest effect on the explained variance of face discrimination abilities. Interestingly, for familiar objects, performance for spiky inanimate-looking objects does not significantly improve the model. The spiky inanimate-looking objects are the objects that are most different from faces, being neither stubby nor animate-looking.

Supplementary table s3

R^2 change between step 3 and step 4 in hierarchical regression models

Quadrant of object space	ΔR^2 novel objects	ΔR^2 familiar objects
Stubby animate-looking	0.0103***	0.0064***
Spiky animate-looking	0.0073***	0.0038**
Stubby inanimate-looking	0.0027**	0.0035**
Spiky inanimate-looking	0.0032**	0.0018

*Note: **$p < 0.01$, ***$p < 0.001$. This table displays the ΔR^2 between steps 3 and 4 in hierarchical regression models where the dependent variable is face discrimination ability, and stimuli from different quadrants of object space are added to the model in step 4.*

Supplementary table s4 shows three regression models where 1) object-matched faces, 2) self-matched faces, and 3) face recognition are predicted by demographics, control foraging trials, and object foraging trials from each quadrant of object space separately. Interestingly, foraging for spiky inanimate-looking objects, which are the most dissimilar to stubby animate-looking objects, does not significantly improve any of the three models. In all three models, the stubby inanimate foraging trials have the lowest *p*-value and in two out of three models (object-matched faces and self-matched faces) they have the highest b-value of all quadrants.

Supplementary table s4

Predicting object-matched face discrimination, self-matched face discrimination and face recognition.

	M1: Object-matched faces			*M2: Self-matched faces*			*M3: Face recognition*		
Factor	b-value	Std. Err.	p-value	b-value	Std. Err.	p-value	b-value	Std. Err.	p-value
Intercept	0.091	0.035	0.009	0.041	0.049	0.404	-1.970	0.406	1.66×10^{-6}
Age	-0.009	0.003	0.006	-0.015	0.005	0.002	0.089	0.039	0.024
Gender	0.011	0.007	0.126	0.013	0.010	0.188	0.024	0.084	0.774
Education	0.007	0.003	0.056	0.011	0.005	0.030	-0.023	0.041	0.573
Control foraging	0.088	0.023	1.8×10^{-3}	-0.094	0.033	0.005	-0.687	0.274	0.012
Spiky inanimate-looking	0.030	0.024	0.213	-0.021	0.035	0.550	0.223	0.286	0.436
Spiky animate-looking	0.064	0.024	0.007	0.058	0.034	0.089	0.285	0.278	0.307
Stubby inanimate-looking	0.049	0.023	0.035	0.058	0.033	0.077	0.545	0.271	0.045
Stubby animate-looking	0.081	0.018	6.2×10^{-6}	0.125	0.025	8.57×10^{-7}	0.507	0.207	0.015

We performed an additional sensitivity analysis (supplementary tables s5 and s6) where we split our large dataset into odd- and even-numbered participants and redid all analyses from Table 3 in the main manuscript with two independent datasets. In all cases, stubby animate-looking objects were significant independent predictors of face processing ability, and effect sizes (b-values) were in all cases higher for stubby animate-looking compared to other objects.

Supplementary table s5

Predicting object-matched face discrimination, self-matched face discrimination and face recognition for odd-numbered participants.

	M1: Object-matched faces			*M2: Self-matched faces*			*M3: Face recognition*		
Factor	b-value	Std.E.	p-value	b-value	Std.E.	p-value	b-value	Std.E.	p-value
Intercept	0.106	0.049	0.033	0.067	0.073	0.364	-2.515	0.613	5.58×10^{-5}
Age	-0.007	0.005	0.129	-0.017	0.007	0.019	0.089	0.059	0.137
Gender	0.003	0.010	0.759	0.019	0.015	0.216	0.108	0.125	0.388
Education	<0.001	0.005	0.944	0.016	0.007	0.026	0.033	0.058	0.574
Control foraging	0.066	0.029	0.022	-0.082	0.043	0.058	-0.453	0.358	0.207
Other objects	0.047	0.013	3.78×10^{-4}	0.043	0.020	0.031	-0.018	0.164	0.911
Stubby animate-looking	0.087	0.025	6.32×10^{-4}	0.097	0.038	0.011	0.561	0.313	0.074

Note: All reported p-values are two-sided, including for stubby animate-looking objects; a one-sided test (fitting a directional hypothesis of positive b-values) for stubby animate-looking objects would additionally be significant for face recognition.

Supplementary table s6

Predicting object-matched face discrimination, self-matched face discrimination and face recognition for even-numbered participants.

	M1: Object-matched faces			*M2: Self-matched faces*			*M3: Face recognition*		
Factor	b-value	Std.E.	p-value	b-value	Std.E.	p-value	b-value	Std.E.	p-value
Intercept	0.071	0.049	0.152	0.010	0.068	0.884	-1.423	0.549	0.010
Age	-0.011	0.005	0.012	-0.012	0.006	0.063	0.079	0.052	0.130
Gender	0.020	0.010	0.052	0.014	0.014	0.316	-0.052	0.112	0.642
Education	0.015	0.005	0.005	0.006	0.007	0.395	-0.083	0.058	0.151
Control foraging	0.126	0.039	0.001	-0.123	0.053	0.020	-1.283	0.430	0.003
Other objects	0.051	0.014	2.62×10^{-4}	0.021	0.019	0.265	-0.014	0.154	0.928
Stubby animate-looking	0.065	0.025	0.011	0.157	0.035	8.38×10^{-6}	0.658	0.281	0.020

Supplementary table s7

Predicting object-matched face discrimination, self-matched face discrimination and face recognition using linear regression

	M1: Object-matched faces			*M2: Self-matched faces*			*M3: Face recognition*		
Factor	b-value	Std. Error	p-value	b-value	Std. Error	p-value	b-value	Std. Error	p-value
Intercept	0.089	0.035	0.010	0.038	0.049	0.447	-1.974	0.407	1.64×10^{-6}
Age	-0.009	0.003	0.007	-0.015	0.005	0.002	0.080	0.039	0.042
Gender	0.012	0.007	0.095	0.016	0.010	0.123	0.025	0.083	0.765
Education	0.007	0.003	0.047	0.011	0.005	0.021	-0.021	0.041	0.610
Control foraging	0.088	0.023	1.69×10^{-4}	-0.098	0.033	0.003	-0.763	0.272	0.005
Other objects	0.048	0.009	5.67×10^{-7}	0.031	0.013	0.023	0.005	0.110	0.961
Stubby animate-looking	0.081	0.018	4.91×10^{-6}	0.128	0.025	4.55×10^{-7}	0.544	0.207	0.009

Note: The table shows three regression models, M1 with object-matched face discrimination ability, M2 with self-matched face discrimination ability and M3 for face recognition as dependent variables. M1: Residual standard error 0 0.070 on 504 degrees of freedom, $R^2 = 0.840$, adjusted $R^2 = 0.838$, F-statistic = 439.6 on 6 and 504 degrees of freedom, $p < 2.2 \times 10^{-16}$. M2: Residual standard error = 0.100 on 504 degrees of freedom, $R^2 = 0.681$, adjusted $R^2 = 0.677$, F-statistic = 179 on 6 and 504 degrees of freedom, $p < 2.2 \times 10^{-16}$. M3: Residual standard error = 0.826 on 504 degrees of freedom, $R^2 = 0.110$, adjusted $R^2 = 0.099$, F-statistic = 10.33 on 6 and 504 degrees of freedom, $p = 8.34 \times 10^{-11}$. B-values are unstandardized regression coefficients.