

Grass and gravel: Investigating visual properties preschool children and adults use when distinguishing naturalistic images

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Supplementary Result Tables B.

Classification Task

The following tables include all results of the GLMMs conducted individually on visual properties and true categories (Table B. 1) and assigned categories.

Table B. 1

Category Membership of the Images Predicted by Visual Properties

Property	True categories								
	Artifacts			Natural Elements			Vegetation		
	Log-odds	CI low	High ^a	Log-odds	CI low	High ^a	Log-odds	CI low	High ^a
Curvature	0.46	-0.10	1.02	-0.37	-0.93	.19	-0.09	-0.63	0.45
Depth	-0.51	-1.07	0.05	-0.29	-0.84	.25	0.99*	0.27	1.70
Gloss	0.21	-0.32	0.74	0.18	-0.35	.71	-0.46	-1.09	0.18
Regularity	0.13	-0.41	0.67	-0.52	-1.11	.07	0.35	-0.20	0.90
Size	-0.44	-1.00	0.11	0.29	-0.28	.86	0.17	-0.39	0.72
Symmetry	0.38	-0.18	0.95	-1.13**	-1.81	-.45	0.67	0.06	1.27
Alpha	-0.78*	-1.44	-0.12	0.93*	0.26	1.59	-0.14	-0.69	0.41
Deviation	0.87*	0.25	1.49	-0.72	-1.39	-.06	-0.20	-0.76	0.36
Cocor	0.40	-0.27	1.06	-0.44	-1.00	.11	0.13	-0.44	0.70
Skew	0.70*	0.10	1.29	-0.28	-0.86	.31	-0.48	-1.11	0.16

* adjusted $p < .05$; ** adjusted $p < .01$ (method: Benjamini and Hochberg, 1995)

^a Confidence intervals with low = 2.5%, high = 97.5%.

Visual Properties Averaged within Categories

Category	Curvature	Depth	Gloss	Regularity	Size	Symmetry	CooCor	Alpha	Deviation	Skew
Artifact	0.378	-0.427	-0.439	0.538	-0.039	0.655	0.205	-0.448	0.329	-0.063
N_Element	-0.881	-0.214	-0.523	0.581	0.196	0.358	-0.016	0.567	-0.457	-0.058
Vegetation	-0.117	0.811	-0.328	0.448	0.167	0.717	0.422	-0.377	-0.020	-0.388

Note: Values are standardized, but not centered, and may differ from the means in Figure 3, main text.

Table B. 2*Visual Properties Predicting Assigned Categories in Children*

Property	Assigned Categories Children								
	Artifacts			Natural Elements			Vegetation		
	Log- Odds	C/low	high ^a	Log- Odds	C/low	high ^a	Log- Odds	C/low	high ^a
Curvature	.38	-.11	.87	-.08	-.48	.32	-.24	-.85	.37
Depth	-.69*	-1.16	-.22	-.44	-.83	-.05	1.15**	.60	1.69
Gloss	.27	-.22	.76	.01	-.39	.41	-.27	-.88	.35
Regularity	.05	-.45	.55	-.21	-.60	.19	.22	-.39	.83
Size	-.51	-1.0	-.03	.16	-.25	.56	.32	-.29	.93
Symmetry	.16	-.34	.65	-.65**	-1.01	-.28	.44	-.16	1.05
Alpha	-.32	-.81	.17	.49	.11	.87	-.06	-.67	.54
Deviation	.80**	.35	1.25	-.18	-.58	.22	-.64	-1.24	-.05
CooCor	.06	-.44	.56	-.32	-.71	.07	.13	-.47	.74
Skew	.71*	.25	1.17	-.11	-.52	.29	-.65	-1.25	-.05

* adjusted $p < .05$. ** adjusted $p < .01$, (method: Benjamini and Hochberg, 1995).

^a Confidence intervals with low = 2.5%, high = 97.5%.

Table B. 3*Visual Properties Predicting Assigned Categories in Adults*

Property	Assigned Categories Adults								
	Artifacts			Natural Elements			Vegetation		
	Log-Odds	CI low	high ^a	Log-Odds	CI low	high ^a	Log-Odds	CI low	high ^a
Curvature	3.0*	.85	5.14	-.33	-1.73	1.08	-1.64	-3.85	.58
Depth	-.68	-2.99	1.63	-1.37	-2.81	.07	2.93**	1.17	4.70
Gloss	1.33	-2.32	4.99	.42	-.97	1.81	-.59	-2.56	1.38
Regularity	.76	-1.81	3.34	-.83	-2.28	.62	.26	-1.72	2.23
Size	-3.05*	-5.26	-.85	.34	-1.06	1.74	1.04	1.04	1.04
Symmetry	2.28	-.64	5.19	-2.81**	-4.16	-1.46	1.06	-.83	2.95
Alpha	-3.04*	-5.12	-.97	1.89*	.61	3.18	-.30	-2.20	1.60
Deviation	3.72**	1.60	5.84	-.99	-2.37	.38	-2.21*	-4.08	-.34
CooCor	2.08	-.34	4.49	-1.26	-2.59	.07	.31	-1.43	2.06
Skew	4.54*	1.48	7.60	-.97	-2.47	.54	-2.66**	-4.34	-.99

* adjusted $p < .05$. ** adjusted $p < .01$, (method: Benjamini and Hochberg, 1995)

^a Confidence intervals with low = 2.5%, high = 97.5%.

Table B. 4*Visual Properties, Participant Groups, and their Interaction Predicting Assigned Categories*

Property	Assigned Categories Group Interaction								
	Artifacts			Natural Elements			Vegetation		
	Log-Odds	CI low	high ^a	Log-Odds	CI low	high ^a	Log-Odds	CI low	high ^a
Group [c] (Curvature)	-.01	-.26	.24	-.19	-.45	.06	.24	-.07	.56
Curvature	.57	-.10	1.24	-.23	-.79	.33	-.23	-.99	.52
Curvature × Group [c]	-.18	-.37	.02	.17*	.01	.34	-.05	-.25	.14
Group [c] (Depth)	-.06	-.31	.19	-.19	-.44	.07	.29	-.03	.60
Depth	-.76	-1.42	-.11	-.66*	-1.20	-.11	1.46**	.78	2.14
Depth × Group [c]	-.08	-.28	.11	.18*	.00	.36	-.23	-.45	-.01
Group [c] (Gloss)	-.06	-.30	.19	-.16	-.42	.10	.24	-.08	.55
Gloss	.25	-.42	.92	.22	-.34	.78	-.52	-1.28	.24
Gloss × Group [c]	.11	-.07	.29	-.25*	-.42	-.09	.30*	.09	.52
Group [c] (Regularity)	-.03	-.28	.22	-.17	-.43	.09	.25	-.07	.56
Regularity	.18	-.50	.86	-.54	-1.10	.01	.50	-.26	1.25
Regularity × Group [c]	-.18	-.35	-.00	.38**	.21	.55	-.32**	-.52	-.12
Group [c] (Size)	-.04	-.29	.21	-.21	-.46	.05	.27	-.05	.59
Size	-.66	-1.33	-.00	.26	-.30	.83	.21	-.54	.97
Size × Group [c]	.05	-.14	.24	-.18*	-.36	-.00	.21	.00	.42
Group [c] (Symmetry)	-.02	-.27	.23	-.11	-.37	.15	.22	-.09	.54
Symmetry	.54	-.14	1.22	-1.40**	-1.92	-.89	.85	.11	1.60
Symmetry × Group [c]	-.50**	-.69	-.31	.76**	.58	.95	-.48**	-.69	-.27
Group [c] (Alpha)	-.00	-.25	.25	-.14	-.40	.12	.24	-.07	.56
Alpha	-1.02*	-1.70	-.34	1.19**	.65	1.73	-.18	-.93	.57
Alpha × Group [c]	.81**	.60	1.02	-.76**	-.95	-.57	.15	-.06	.35
Group [c] (Deviation)	.03	-.22	.28	-.20	-.45	.06	.23	-.09	.54
Deviation	1.19**	.57	1.81	-.60	-1.15	-.04	-.46	-1.20	.28
Deviation × Group [c]	-.30**	-.48	-.12	.50**	.33	.67	-.39**	-.60	-.18
Group [c] (CooCor)	-.01	-.26	.24	-.18	-.43	.08	.25	-.07	.56
CooCor	.52	-.17	1.21	-.70*	-1.25	-.15	.19	-.56	.93
CooCor × Group [c]	-.57**	-.80	-.34	.41**	.23	.58	-.04	-.22	.15
Group [c] (Skew)	.01	-.24	.25	-.19	-.45	.07	.26	-.06	.58
Skew	1.23**	.60	1.87	-.39	-.95	.17	-.95	-1.70	-.21
Skew × Group [c]	-.45**	-.63	-.26	.33**	.14	.52	.23	.00	.45

* adjusted p < .05. ** adjusted p < .01, (method: Benjamini and Hochberg, 1995).

^a Confidence intervals with low = 2.5%, high = 97.5%.

Similarity-sorting Task

Table B. 5

*R*² values of the Agglomeration Process HCA

This data is uploaded to:

https://osf.io/8xy5n/?view_only=6ddced286c31456fae7d20dd86e072e6

file: Explained_Similarity_HCA_sorttask_public.txt

Contrasts of the ANOVAs on the HCA R² values:

Table B. 6

Tukey's HSD Contrasts of R² Visual Properties, Children's HCA

Contrast	Difference	CI low	CI high^a	adjusted p
Deviation-Alpha	.054	.027	.08	<.001
CooCor-Alpha	.072	.046	.099	<.001
Curve-Alpha	.011	-.015	.038	.944
Depth-Alpha	.149	.122	.175	<.001
Gloss-Alpha	-.009	-.036	.017	.986
Regularity-Alpha	.106	.079	.132	<.001
Size-Alpha	.046	.02	.073	<.001
Skew-Alpha	.113	.087	.14	<.001
Symmetry-Alpha	.046	.019	.072	<.001
CooCor-Deviation	.018	-.008	.045	.469
Curve-Deviation	-.043	-.069	-.016	<.001
Depth-Deviation	.095	.068	.121	<.001
Gloss-Deviation	-.063	-.089	-.036	<.001
Regularity-Deviation	.052	.026	.079	<.001
Size-Deviation	-.008	-.034	.019	.996
Skew-Deviation	.06	.033	.086	<.001
Symmetry-Deviation	-.008	-.034	.019	.995
Curve-CooCor	-.061	-.087	-.034	<.001
Depth-CooCor	.077	.05	.103	<.001
Gloss-CooCor	-.081	-.108	-.055	<.001
Regularity-CooCor	.034	.007	.06	.002
Size-CooCor	-.026	-.052	.001	.063
Skew-CooCor	.041	.015	.068	<.001
Symmetry-CooCor	-.026	-.053	0	.059
Depth-Curve	.137	.111	.164	<.001
Gloss-Curve	-.02	-.047	.006	.311
Regularity-Curve	.095	.068	.121	<.001
Size-Curve	.035	.009	.061	.001
Skew-Curve	.102	.076	.129	<.001

(Table B. 6 *continued*)

Contrast	Difference	C/low	C/high^a	adjusted p
Symmetry-Curve	.035	.008	.061	.001
Gloss-Depth	-.158	-.184	-.131	<.001
Regularity-Depth	-.043	-.069	-.016	<.001
Size-Depth	-.102	-.129	-.076	<.001
Skew-Depth	-.035	-.062	-.009	.001
Symmetry-Depth	-.103	-.129	-.076	<.001
Regularity-Gloss	.115	.088	.141	<.001
Size-Gloss	.055	.029	.082	<.001
Skew-Gloss	.122	.096	.149	<.001
Symmetry-Gloss	.055	.029	.082	<.001
Size-Regularity	-.06	-.086	-.033	<.001
Skew-Regularity	.007	-.019	.034	.996
Symmetry-Regularity	-.06	-.086	-.033	<.001
Skew-Size	.067	.041	.094	<.001
Symmetry-Size	0	-.027	.026	1
Symmetry-Skew	-.067	-.094	-.041	<.001

Table B. 7

Tukey's HSD Contrasts of R² Assigned Categories, Children's HCA

Contrast	Difference	C/low	C/high^a	adjusted p
n.perc-a.perc	0	-.026	.025	.999
v.perc-a.perc	.066	.041	.091	<.001
v.perc-n.perc	.066	.041	.092	<.001

Table B. 8*Tukey's HSD Contrasts of R² Visual Properties, Adults' HCA*

Contrast	Difference	CI low	CI high^a	adjusted p
Deviation-Alpha	.131	.097	.164	<.001
CooCor-Alpha	-.012	-.045	.022	.981
Curve-Alpha	.12	.087	.153	<.001
Depth-Alpha	.113	.08	.147	<.001
Gloss-Alpha	-.078	-.111	-.045	<.001
Regularity-Alpha	.174	.141	.207	<.001
Size-Alpha	.1	.067	.134	<.001
Skew-Alpha	.068	.034	.101	<.001
Symmetry-Alpha	.157	.124	.191	<.001
CooCor-Deviation	-.143	-.176	-.109	<.001
Curve-Deviation	-.011	-.044	.023	.99
Depth-Deviation	-.018	-.051	.016	.802
Gloss-Deviation	-.209	-.242	-.176	<.001
Regularity-Deviation	.043	.01	.077	.002
Size-Deviation	-.03	-.064	.003	.109
Skew-Deviation	-.063	-.097	-.03	<.001
Symmetry-Deviation	.026	-.007	.06	.27
Curve-CooCor	.132	.099	.165	<.001
Depth-CooCor	.125	.092	.158	<.001
Gloss-CooCor	-.066	-.1	-.033	<.001
Regularity-CooCor	.186	.153	.219	<.001
Size-CooCor	.112	.079	.146	<.001
Skew-CooCor	.08	.046	.113	<.001
Symmetry-CooCor	.169	.136	.202	<.001
Depth-Curve	-.007	-.04	.026	1
Gloss-Curve	-.198	-.232	-.165	<.001
Regularity-Curve	.054	.021	.087	<.001
Size-Curve	-.02	-.053	.014	.692
Skew-Curve	-.052	-.086	-.019	<.001
Symmetry-Curve	.037	.004	.071	.016
Gloss-Depth	-.191	-.225	-.158	<.001
Regularity-Depth	.061	.027	.094	<.001
Size-Depth	-.013	-.046	.021	.971

(Table B. 8 *continued*)

Contrast	Difference	CI/low	CI/high^a	adjusted p
Skew-Depth	-.045	-.079	-.012	.001
Symmetry-Depth	.044	.011	.077	.001
Regularity-Gloss	.252	.219	.286	<.001
Size-Gloss	.179	.145	.212	<.001
Skew-Gloss	.146	.112	.179	<.001
Symmetry-Gloss	.235	.202	.269	<.001
Size-Regularity	-.074	-.107	-.04	<.001
Skew-Regularity	-.106	-.14	-.073	<.001
Symmetry-Regularity	-.017	-.05	.017	.847
Skew-Size	-.033	-.066	.001	.062
Symmetry-Size	.057	.023	.09	<.001
Symmetry-Skew	.089	.056	.123	<.001

Table B. 9

Tukey's HSD Contrasts of R² Assigned Categories, Adults' HCA

Contrast	Difference	CI/low	CI/high^a	adjusted p
N_Element-Artifact	.031	.008	.059	.006
Vegetation-Artifact	.081	.057	.105	<.001
Vegetation- N_Element	.049	.025	.073	<.001

Table B. 10*Tukey's HSD Contrasts of R² Comparison Children and Adults, Visual Properties*

Contrast	Difference	CI/low	CI/high^a	adjusted p
Children-Adults	-.045	-.051	-.039	<.001
Alpha:Children-Alpha:Adults	-.027	-.061	.007	.372
Deviation:Children-Deviation:Adults	-.104	-.138	-.07	<.001
CooCor:Children-CooCor:Adults	.057	.023	.091	<.001
Curve:Children-Curve:Adults	-.136	-.17	-.101	<.001
Depth:Children-Depth:Adults	.009	-.026	.043	1
Gloss:Children-Gloss:Adults	.042	.008	.076	.002
Regularity:Children-Regularity:Adults	-.095	-.129	-.061	<.001
Size:Children-Size:Adults	-.081	-.115	-.047	<.001
Skew:Children-Skew:Adults	.019	-.015	.053	.921
Symmetry:Children-Symmetry:Adults	-.138	-.172	-.104	0

Table B. 11*Tukey's HSD Contrasts of R² Comparison Children and Adults, Assigned Categories*

Contrast	Difference	CI/low	CI/high^a	adjusted p
N_Element -Artifact	-.016	-.001	.032	.072
Vegetation-Artifact	-.074	-.057	-.090	<.001
Vegetation- N_Element	-.058	-.041	-.075	<.001

^a Confidence intervals of Table 7–13 with low = 2.5%, high = 97.5%