

To Stylize or not to Stylize?

Effect of Shape and Material Stylization on the Perception of Computer Generated Faces

— *Supplementary Material* —

Eduard Zell¹ Carlos Aliaga² Adrian Jarabo² Katja Zibrek³
Diego Gutierrez² Rachel McDonnell³ Mario Botsch¹

¹Bielefeld University ²Universidad de Zaragoza ³Trinity College Dublin

This is the supplementary material for the paper *To Stylize or not to Stylize? Effect of Shape and Material Stylization on the Perception of Computer Generated Faces*. It includes the following sections:

- **A Stimuli** (p.2)
 - **A.1 Experiment 1a. Shape and Material** (p.2)
 - **A.2 Experiment 1b. Shading and Lighting** (p.4)
 - **A.3 Experiment 2. Further Investigation of Shape and Material** (p.8)
- **B Effect of Expressions in Experiments 1a and 1b** (p.18)
- **C Additional Diagrams** (p.19)
- **D Statistical Analysis of the Experiments** (p.24)

In addition to the present document, we include the post-hoc tests in the separate file. For each experiment a separate MS Excel document has been created. Within each file a separate spreadsheet exists for each rating. All files will be also available at: <http://graphics.uni-bielefeld.de/publications/sigasia2015/>

A Stimuli

A.1 Experiment 1a. Shape and Material

Each of the following figures shows every material - expression combination for a particular level of shape stylization. The x and y axes represent the expressions and the material stylization levels respectively.

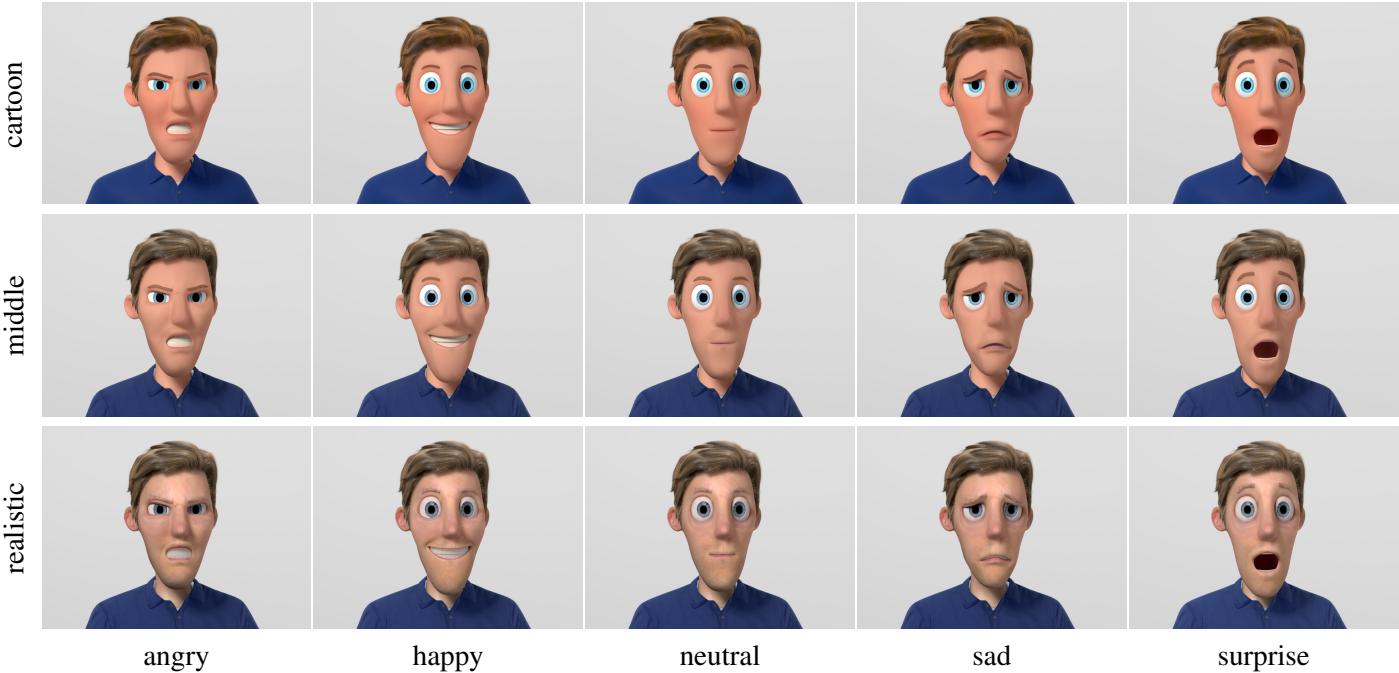


Figure A.1: Experiment 1a, shape and material. The five expressions (x axis) of the cartoon shape combined with the three levels of material stylization (y axis).

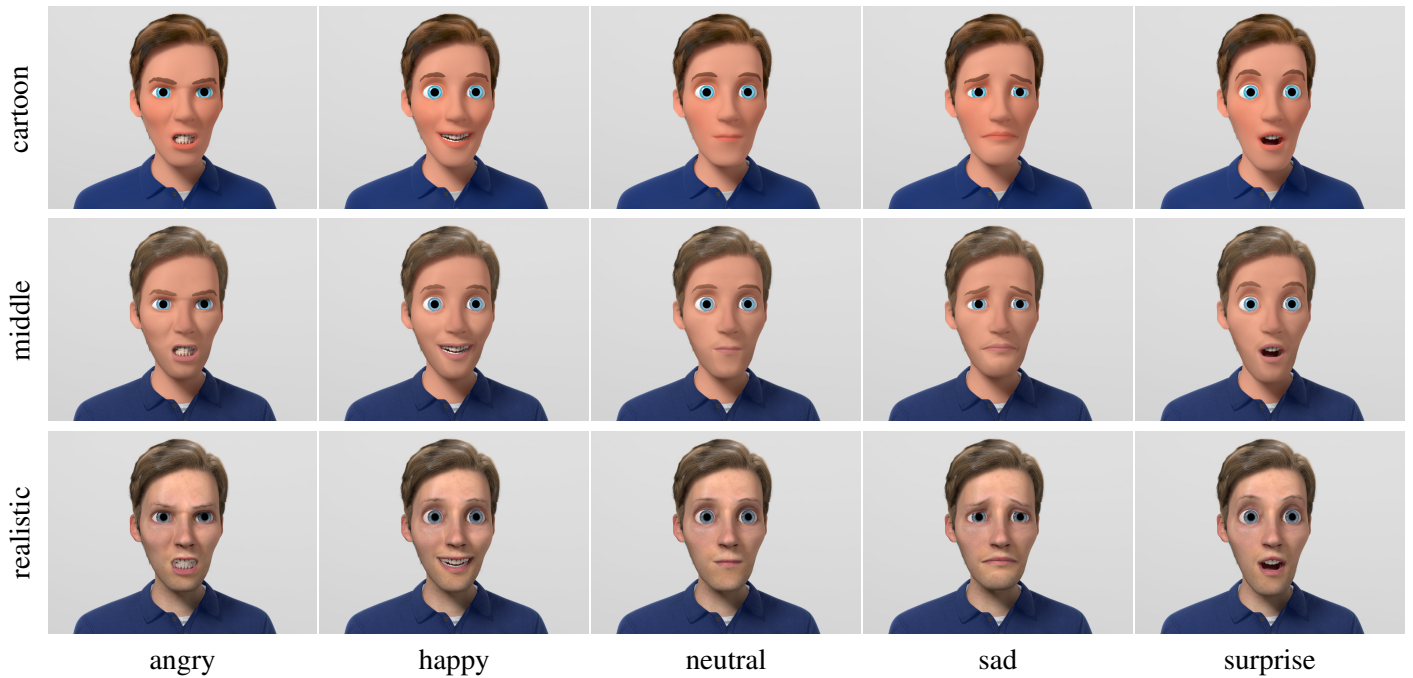


Figure A.2: *Experiment 1a, shape and material. The five expressions (x axis) of the middle shape combined with the three levels of material stylization (y axis).*

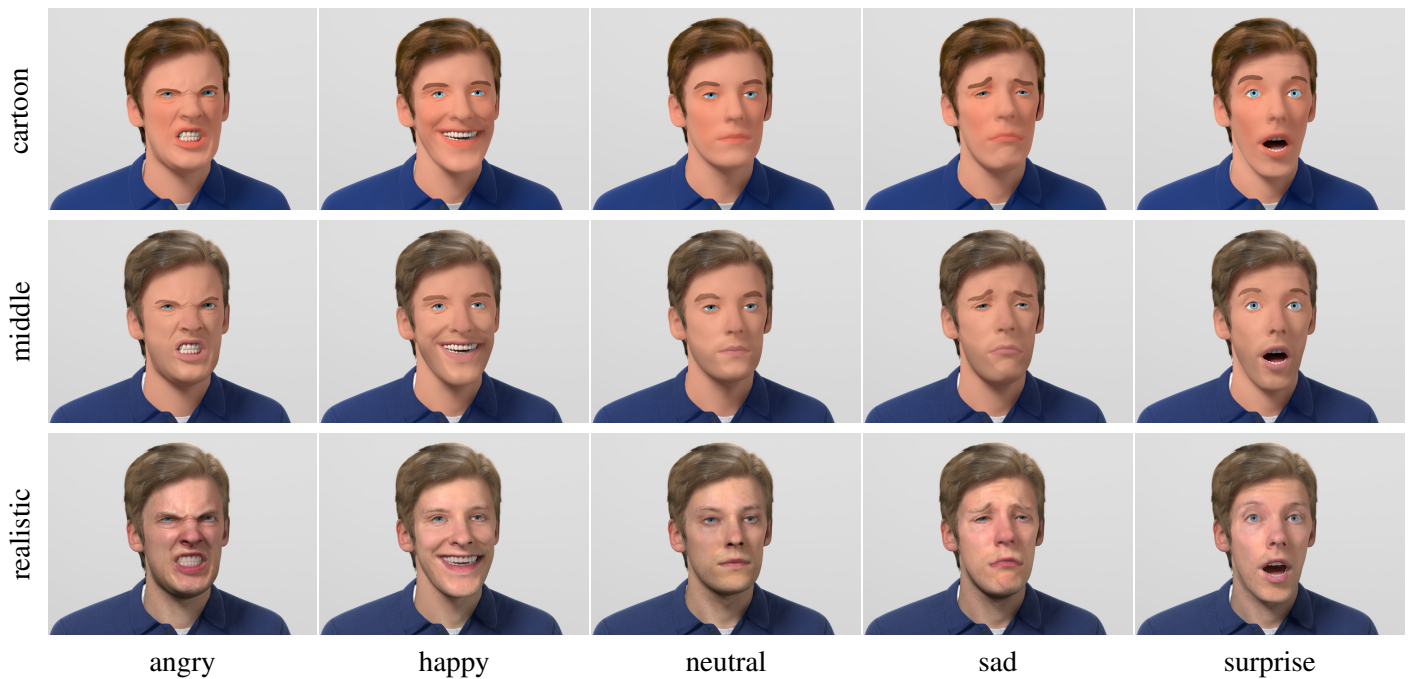


Figure A.3: *Experiment 1a, shape and material. The five expressions (x axis) of the realistic shape combined with the three levels of material stylization (y axis).*

A.2 Experiment 1b. Shading and Lighting

Each of the following figures shows every lighting - expression combination for a particular level of shape and material pairs. The x axis represents the facial expressions. The y axis represents lighting setup, from top to bottom rows: direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS). There are two figures per shape stylization, one for each of the two shaders used (Phong and SSS skin).

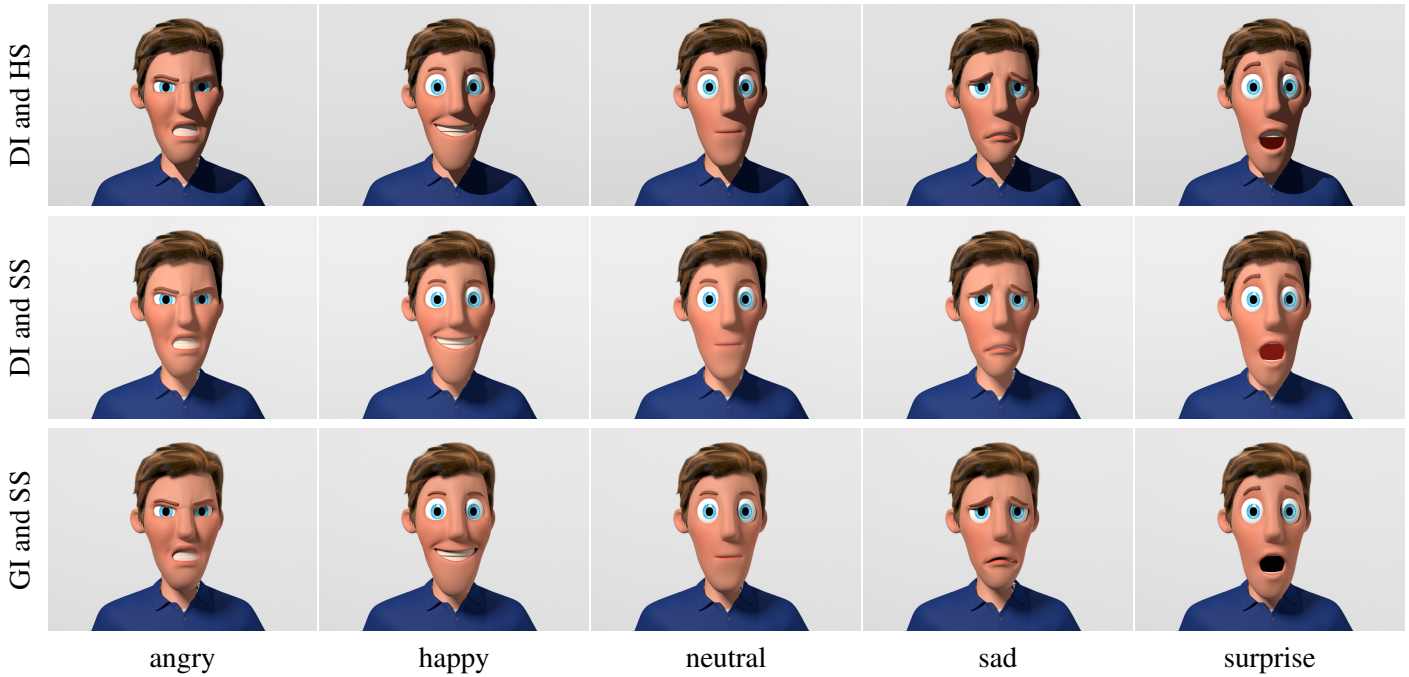


Figure A.4: *Experiment 1b: shading and lighting. The five expressions (x axis) of the cartoon shape with Phong shader, under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).*

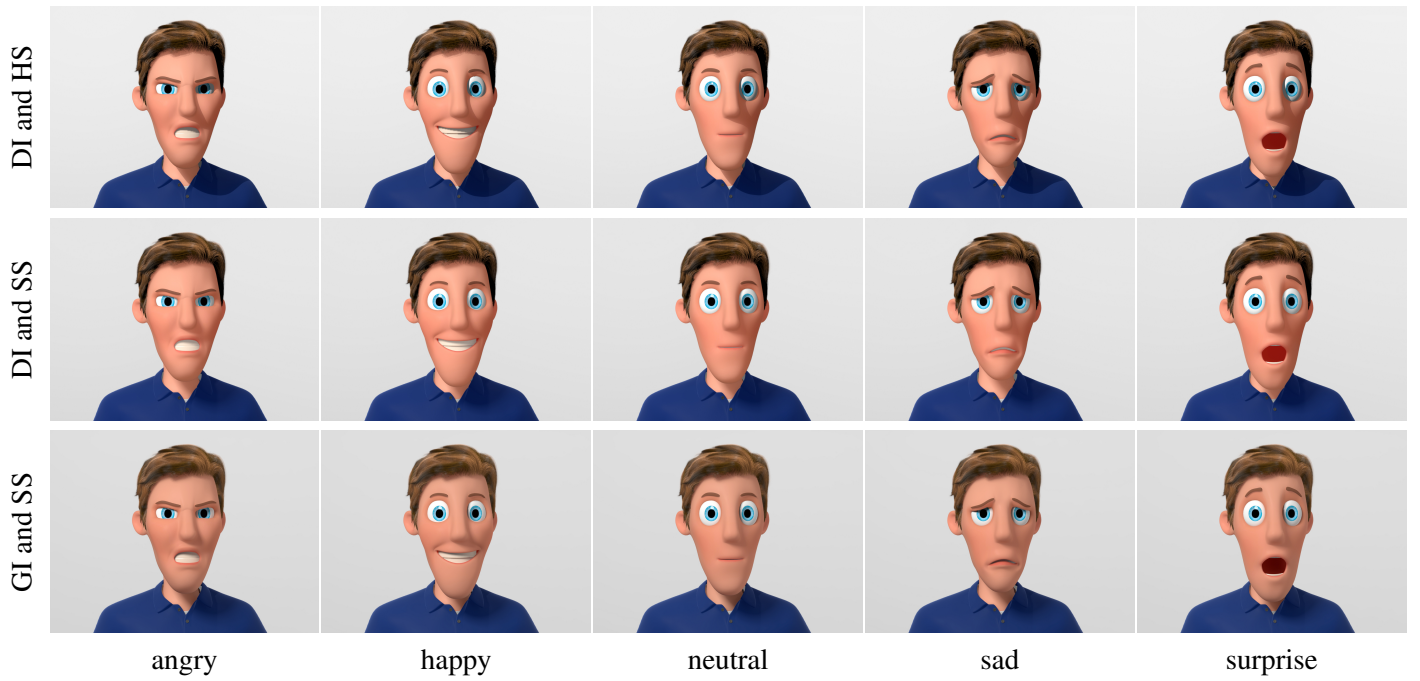


Figure A.5: Experiment 1b, shading and lighting. The five expressions (x axis) of the cartoon shape with skin SSS shader; under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).

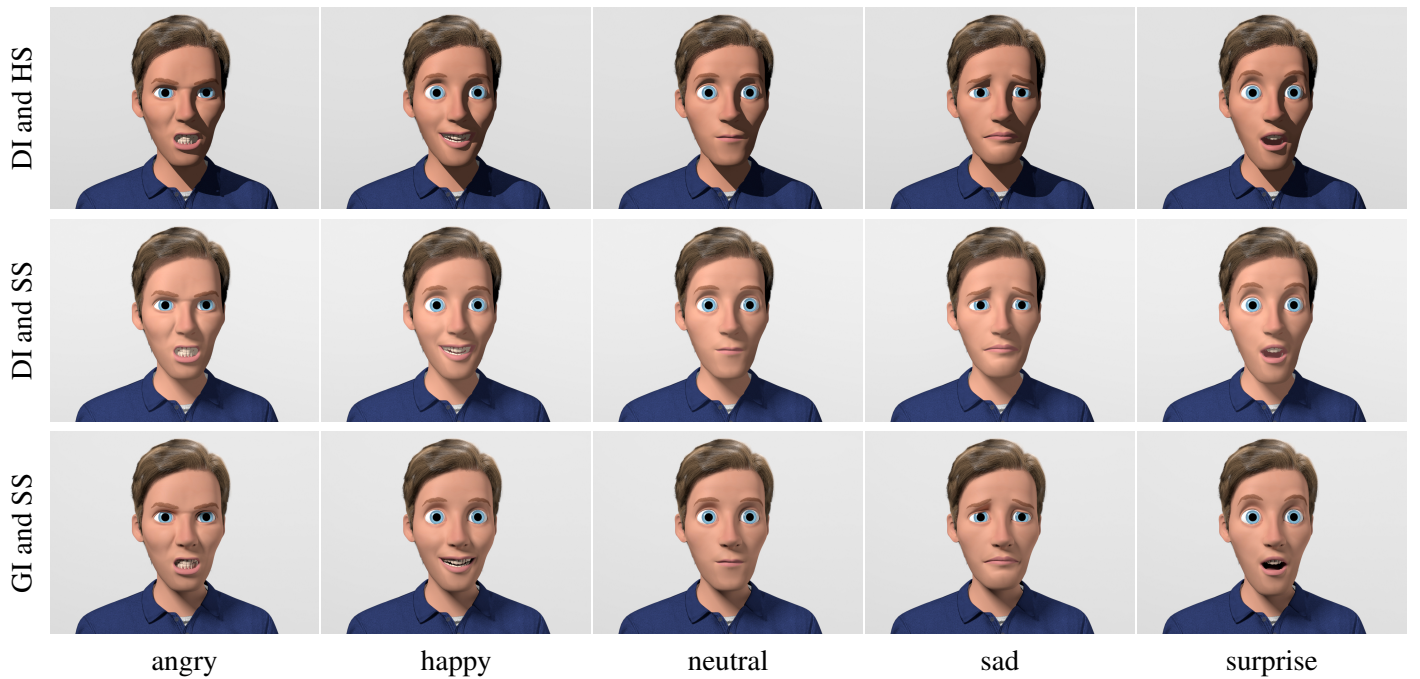


Figure A.6: Experiment 1b, shading and lighting. The five expressions (x axis) of the middle shape with Phong shader; under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).

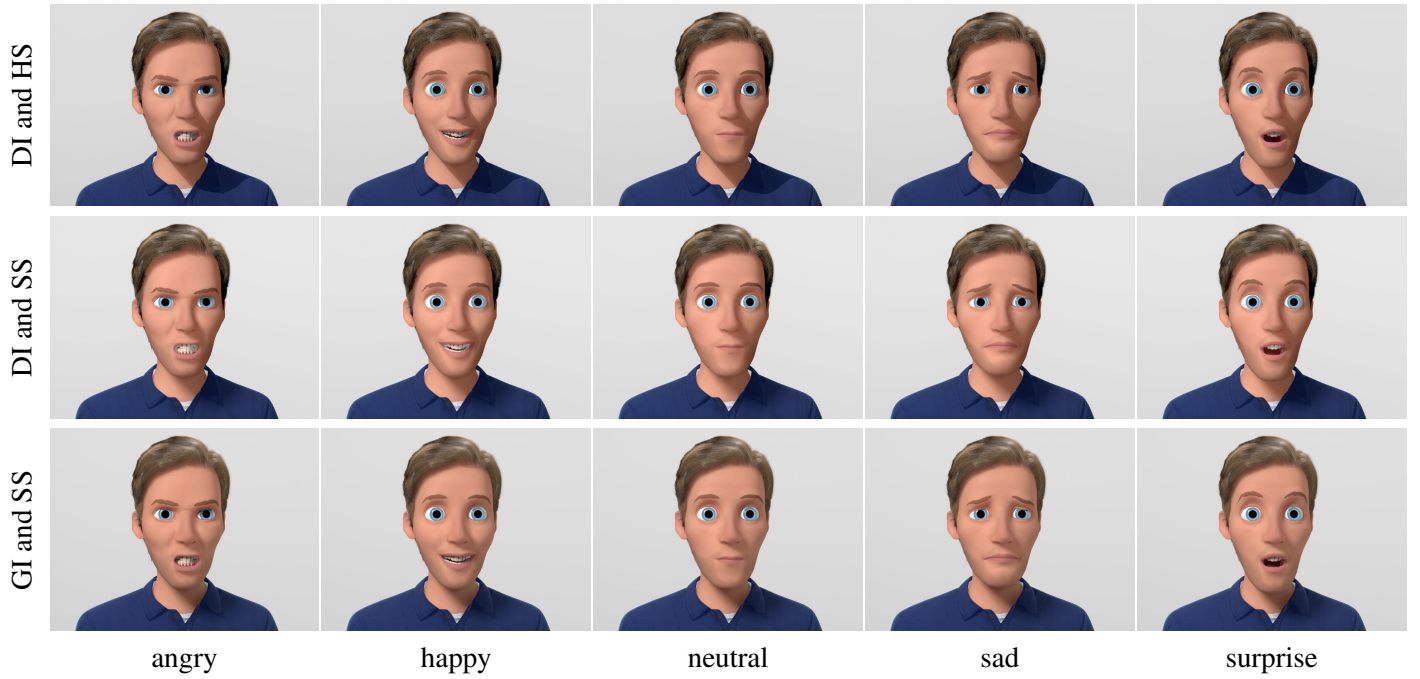


Figure A.7: Experiment 1b, shading and lighting. The five expressions (x axis) of the middle shape with skin SSS shader; under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).

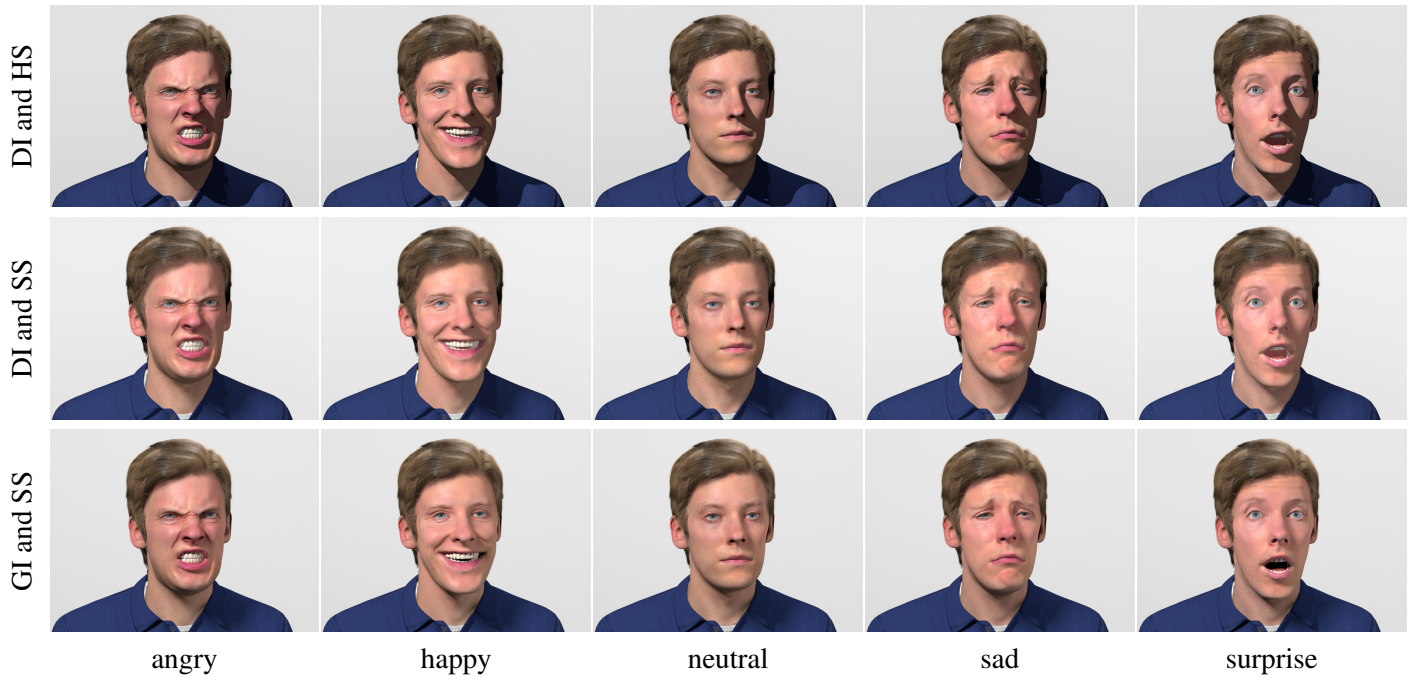


Figure A.8: Experiment 1b, shading and lighting. The five expressions (x axis) of the realistic shape with Phong shader; under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).

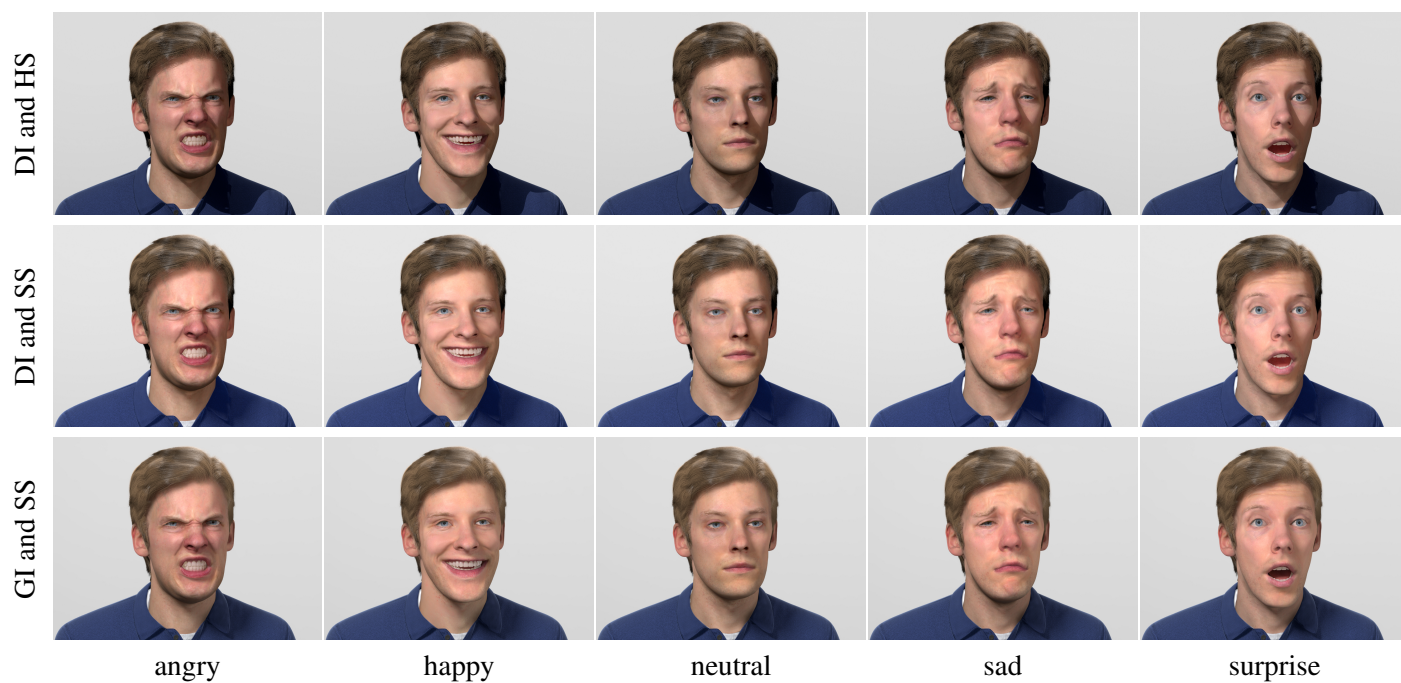


Figure A.9: *Experiment 1b, shading and lighting. The five expressions (x axis) of the realistic shape with skin SSS shader; under three different lighting setups (y axis) - from top to bottom row, direct illumination with hard shadows (DI and HS), direct illumination with soft shadows (DI and SS), and global illumination with soft shadows (GI and SS).*

A.3 Experiment 2. Further Investigation of Shape and Material

Each of the following figures shows every material - expression combination for a particular level of shape stylization. The x and y axes represent the expressions and the material stylization levels respectively.



Figure A.10: Experiment 2. Five expressions (x axis) of the most abstract shape (level s_0) of the male character, combined with the five levels of material stylization (y axis).

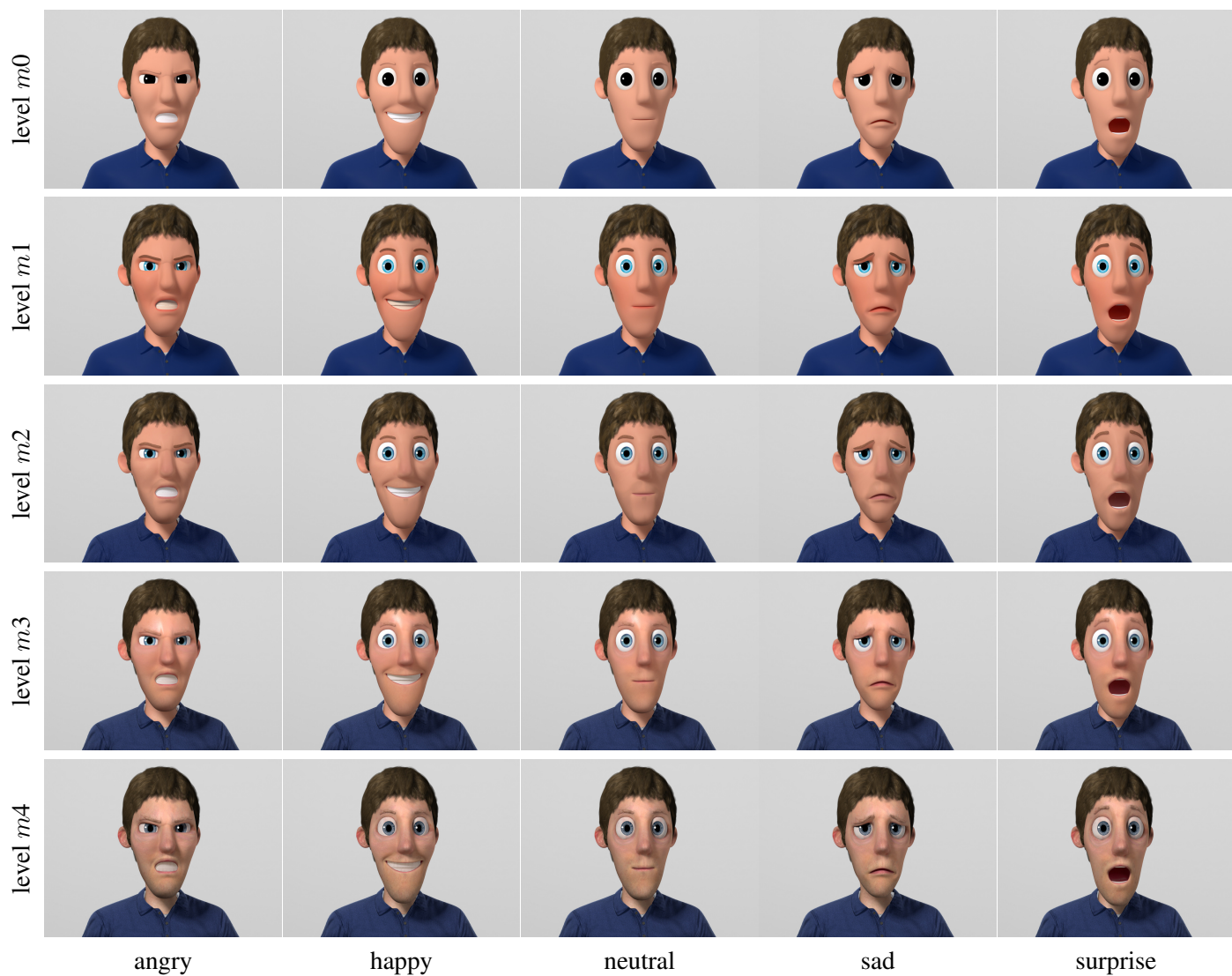


Figure A.11: Experiment 2. Five expressions (x axis) of the level s_1 shape of the male character, combined with the five levels of material stylization (y axis).

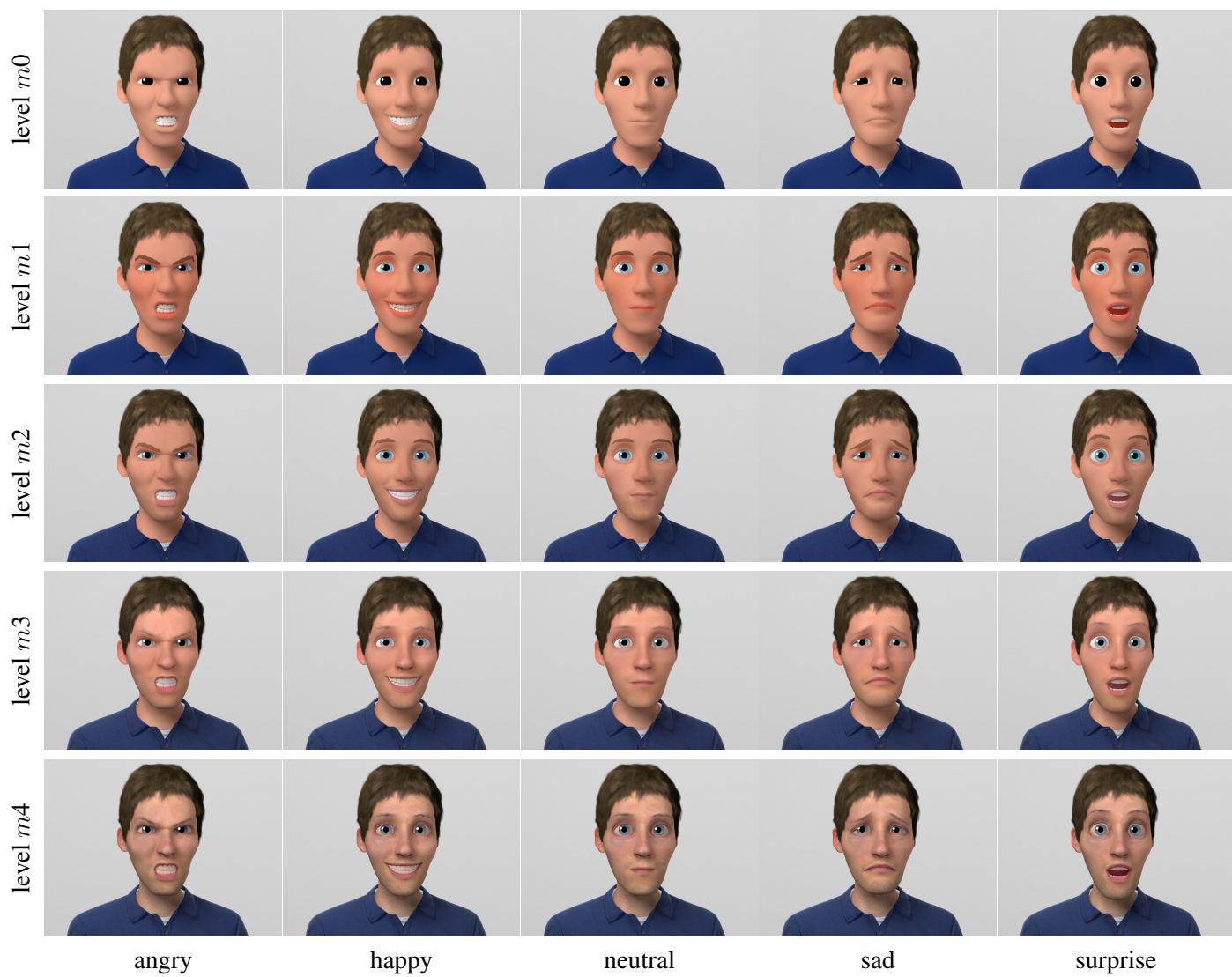


Figure A.12: Experiment 2. Five expressions (x axis) of the level s_2 shape of the male character, combined with the five levels of material stylization (y axis).



Figure A.13: Experiment 2. Five expressions (x axis) of the level $s3$ shape of the male character, combined with the five levels of material stylization (y axis).



Figure A.14: Experiment 2. Five expressions (x axis) of the most realistic shape (level s_4) of the male character, combined with the five levels of material stylization (y axis).



Figure A.15: Experiment 2. Five expressions (*x* axis) of the most abstract shape (*level s0*) of the female character, combined with the five levels of material stylization (*y* axis).

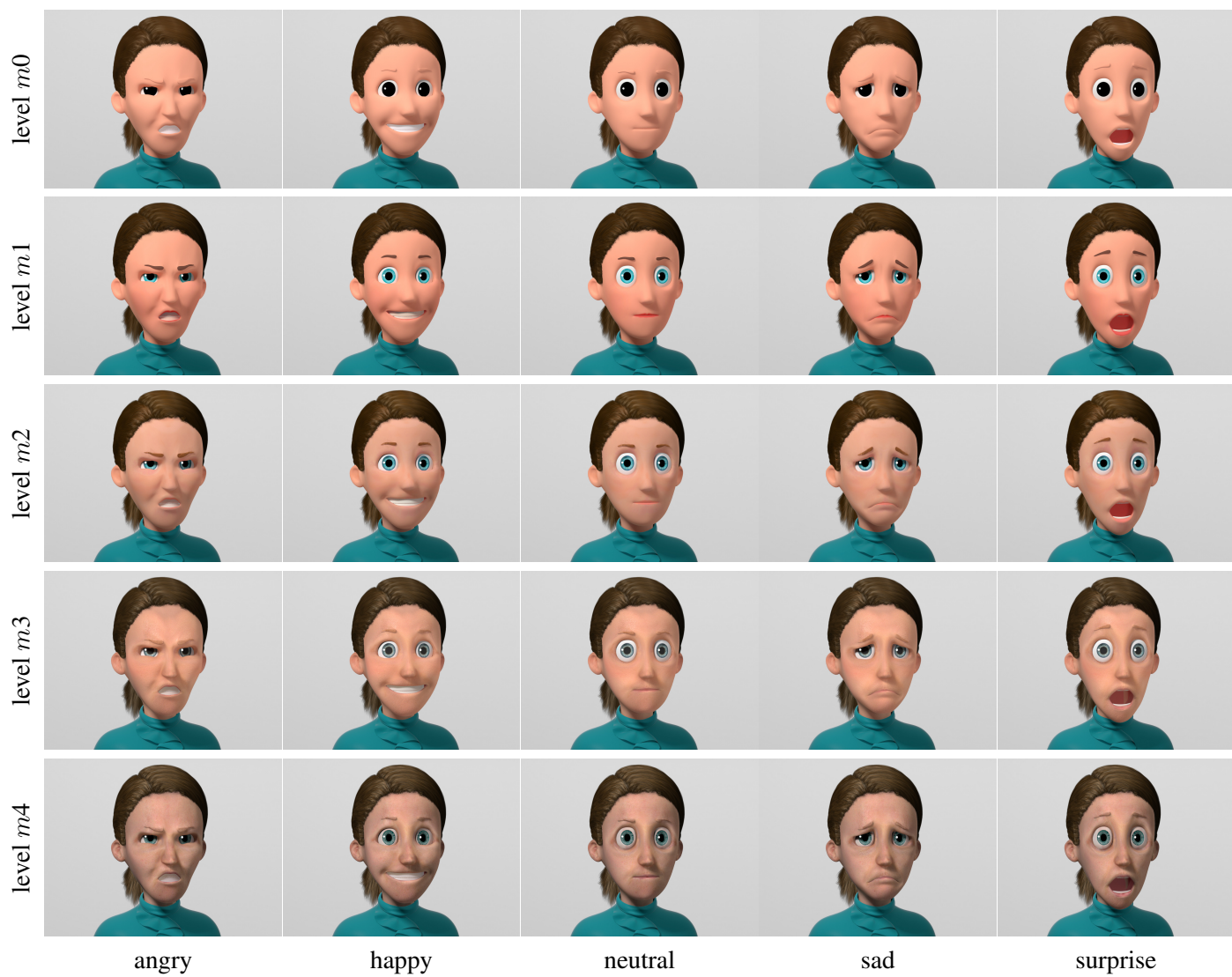


Figure A.16: *Experiment 1, shape and material. Five expressions (x axis) of the level $s1$ shape of the female character, combined with the five levels of material stylization (y axis).*

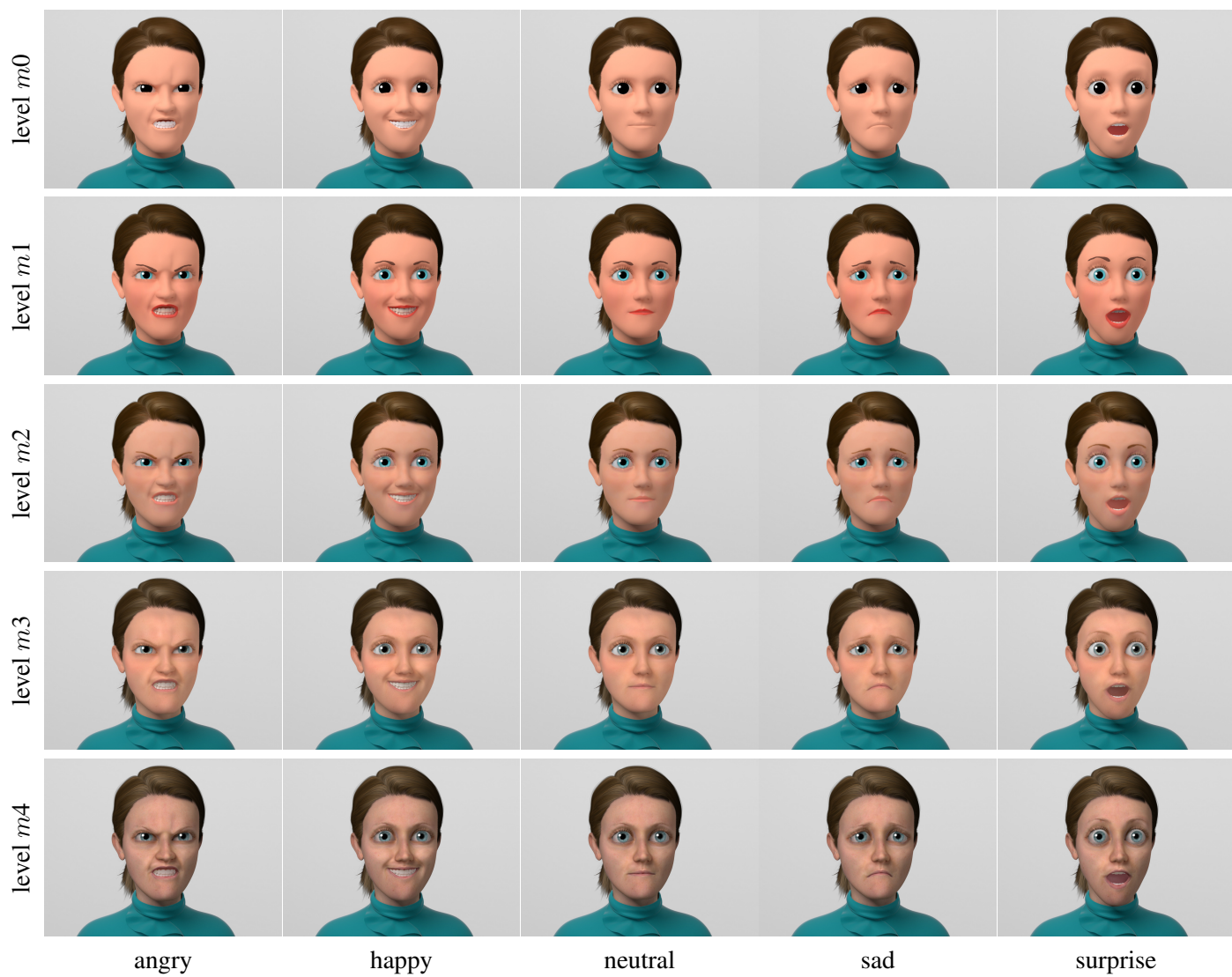


Figure A.17: Experiment 2. Five expressions (*x* axis) of the level *s2* shape of the female character, combined with the five levels of material stylization (*y* axis).

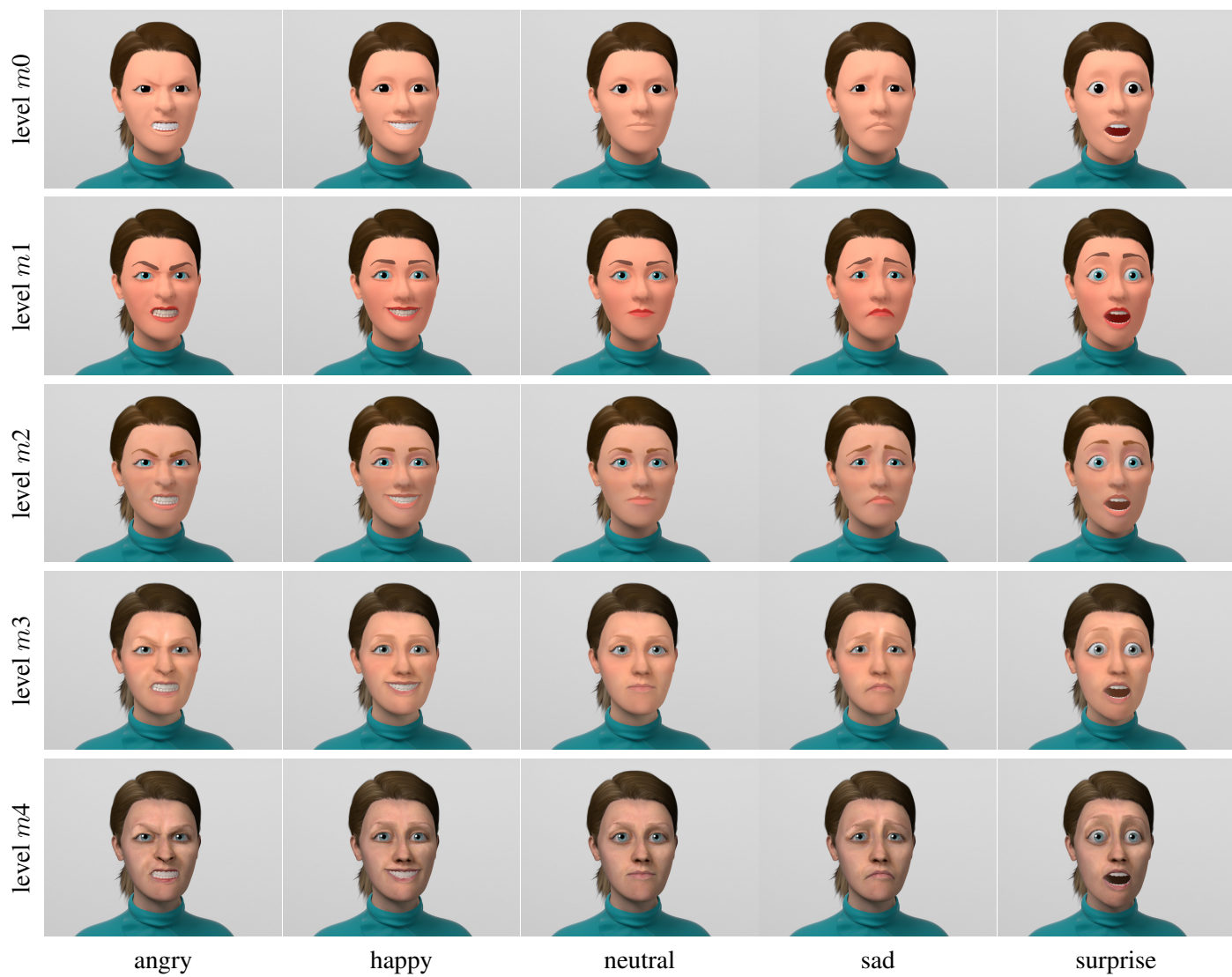


Figure A.18: Experiment 2. Five expressions (x axis) of the level $s3$ shape of the female character, combined with the five levels of material stylization (y axis).



Figure A.19: Experiment 2. Five expressions (x axis) of the most realistic shape (level s_4) of the female character, combined with the five levels of material stylization (y axis).

B Effect of Expressions in Experiments 1a and 1b

In this section, we discuss the results of Experiment 1a (shape and material) and Experiment 1b (shading and lighting), analyzing the particular *expressions* of the stimuli. For the analysis we conducted a three-way repeated measure ANOVA. A Tukey HSD test was used for pairwise comparisons within each experiment. Figure B.1 shows the results, which we proceed now to analyze.

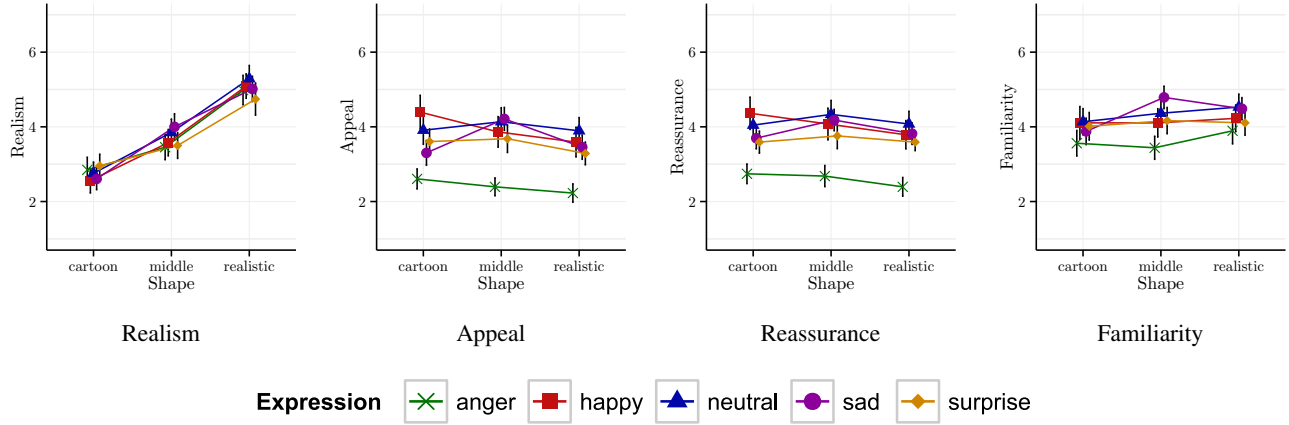


Figure B.1: Results of Expressions in Experiments 1a: While emotions do not differ in realism, the anger expression was perceived as more eerie and unappealing for all stylization levels.

Realism A main effect of expression for realism was found in the shading and lighting experiment (Exp. 1b: $F(4, 76) = 3.78, p = 0.007$), but not in the shape and material experiment. The effect could mainly be attributed to the sad expression, which has been rated slightly more realistic ($p = 0.005$) than others. Because the means (3.90 ± 0.15) of all groups are within a small range, we classify this effect as noise and omit similar examples for the rest of this section.

Appeal and Reassurance A main effect was found for appeal in both experiments (Exp. 1a: $F^*(2.57, 54.01) = 33.14, pp < 0.0001, \epsilon = 0.643$; Exp. 1b: $F^*(1.53, 29.10) = 22.22, p < 0.0001, \epsilon = 0.383$), which is primarily caused by the anger expression ($p < 0.0001$). Similarly, there is a main effect of expression for reassurance in both experiments (Exp. 1a: $F^*(2.61, 54.77) = 24.61, p < 0.0001, \epsilon = 0.652$; Exp. 1b: $F^*(1.68, 31.92) = 18.61, p < 0.0001, \epsilon = 0.420$), again mainly caused by the anger expression ($p < 0.0001$).

Familiarity A similar main effect is obtained for familiarity (Exp. 1a: $F(4, 84) = 8.80, p < 0.0001$; Exp. 1b: $F^*(2.04, 38.84) = 5.15, p = 0.001, \epsilon = 0.511$). In this case anger is the only reason for the significant differences of the means. But the anger expression is only significantly different from the happy ($p = 0.003$) and neutral expressions ($p = 0.001$).

C Additional Diagrams

C.1 Experiment 1a: *Shape and Material*

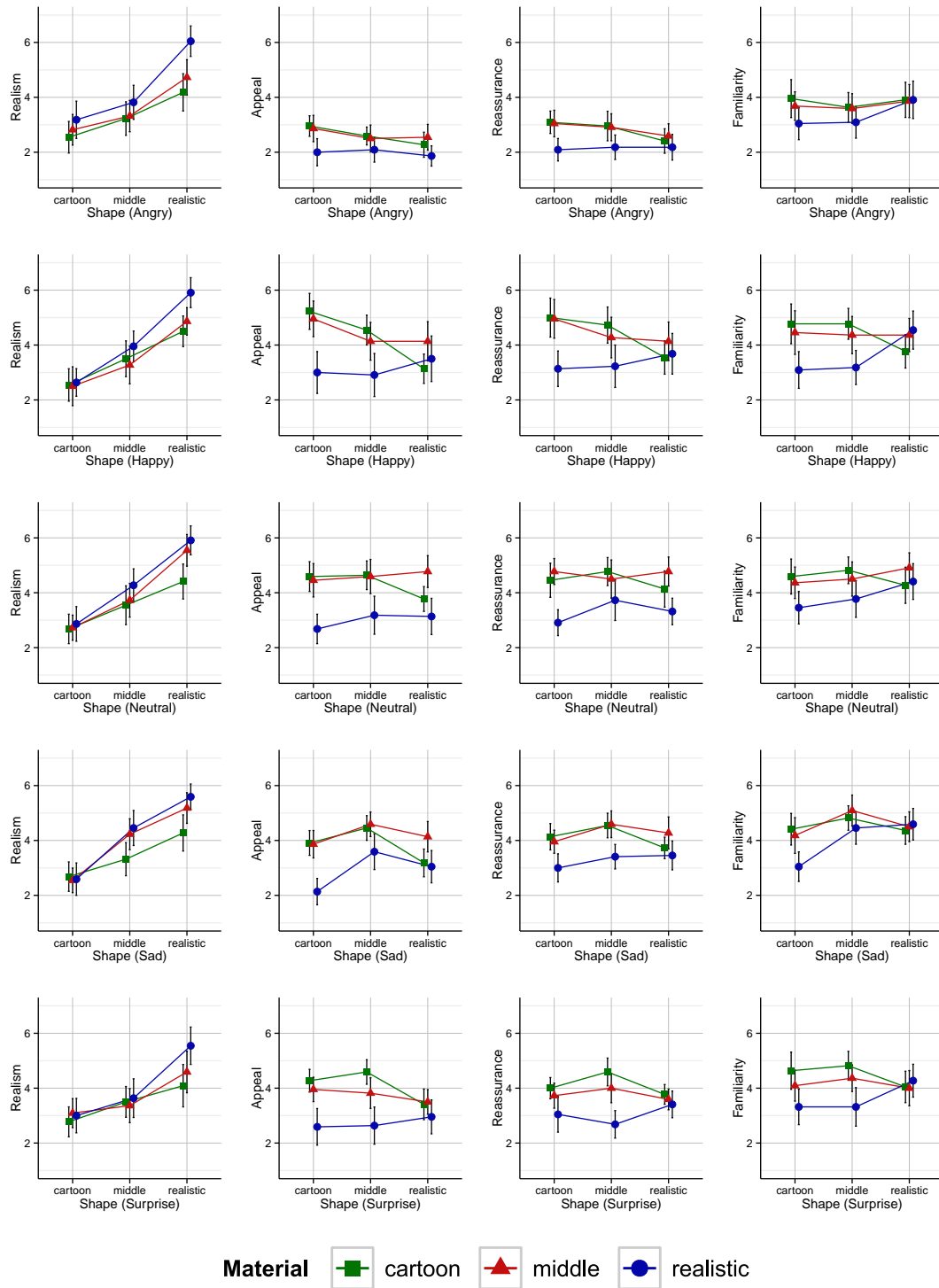


Figure C.1: Results for Experiment 1a: Ratings for perceived realism, appeal, reassurance and familiarity, separated by expression.

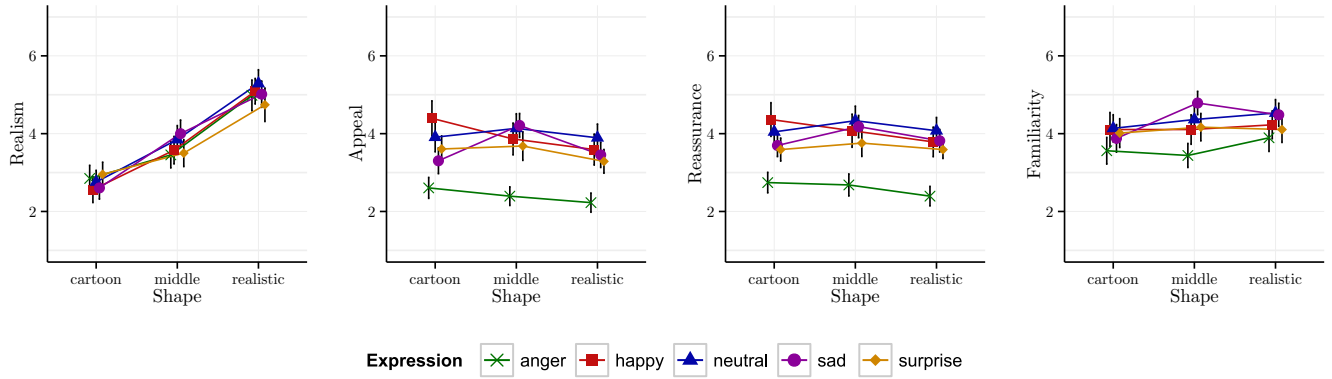


Figure C.2: Results for Experiment 1a: Ratings for perceived realism, appeal, reassurance and familiarity averaged over all materials and grouped by shape and expression.

C.2 Experiment 1b: *Shading and Lighting*

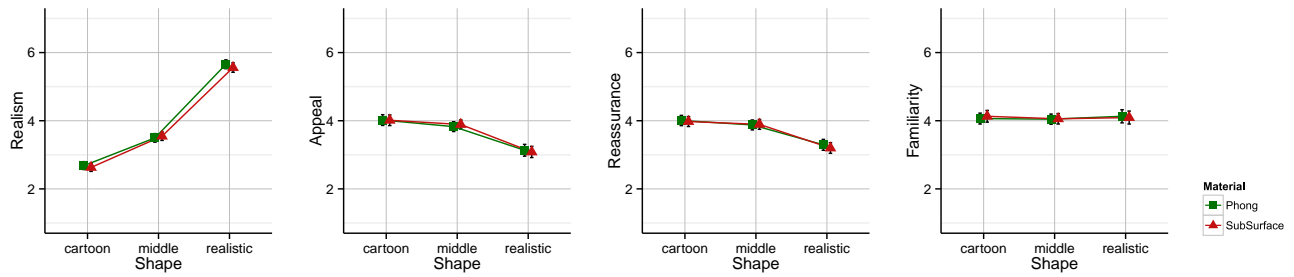


Figure C.3: Results for Experiment 1b: Ratings for perceived realism, appeal, reassurance and familiarity grouped by stylization level and shading.

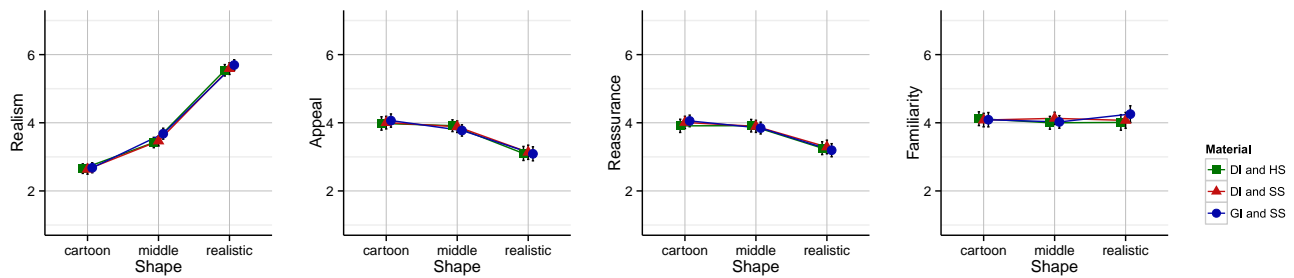


Figure C.4: Results for Experiment 1b: Ratings for perceived realism, appeal, reassurance and familiarity grouped by stylization level and lighting.

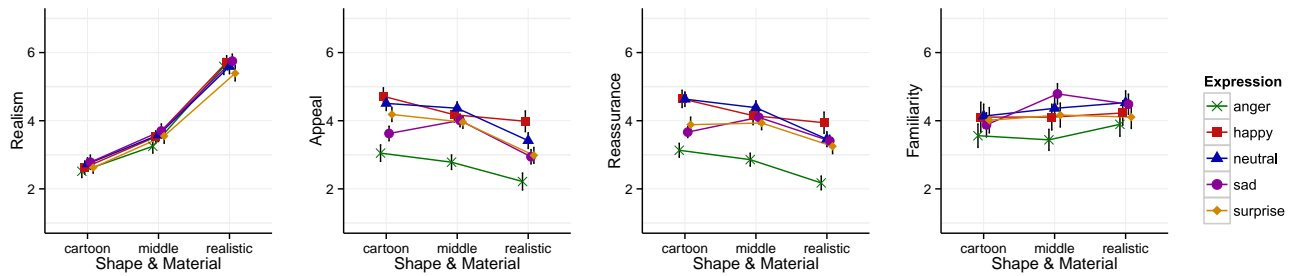


Figure C.5: Results for Experiment 1b: Ratings for perceived realism, appeal, reassurance and familiarity grouped by stylization level and expression.

C.3 Experiment 2: *Further Investigation of Shape and Material*

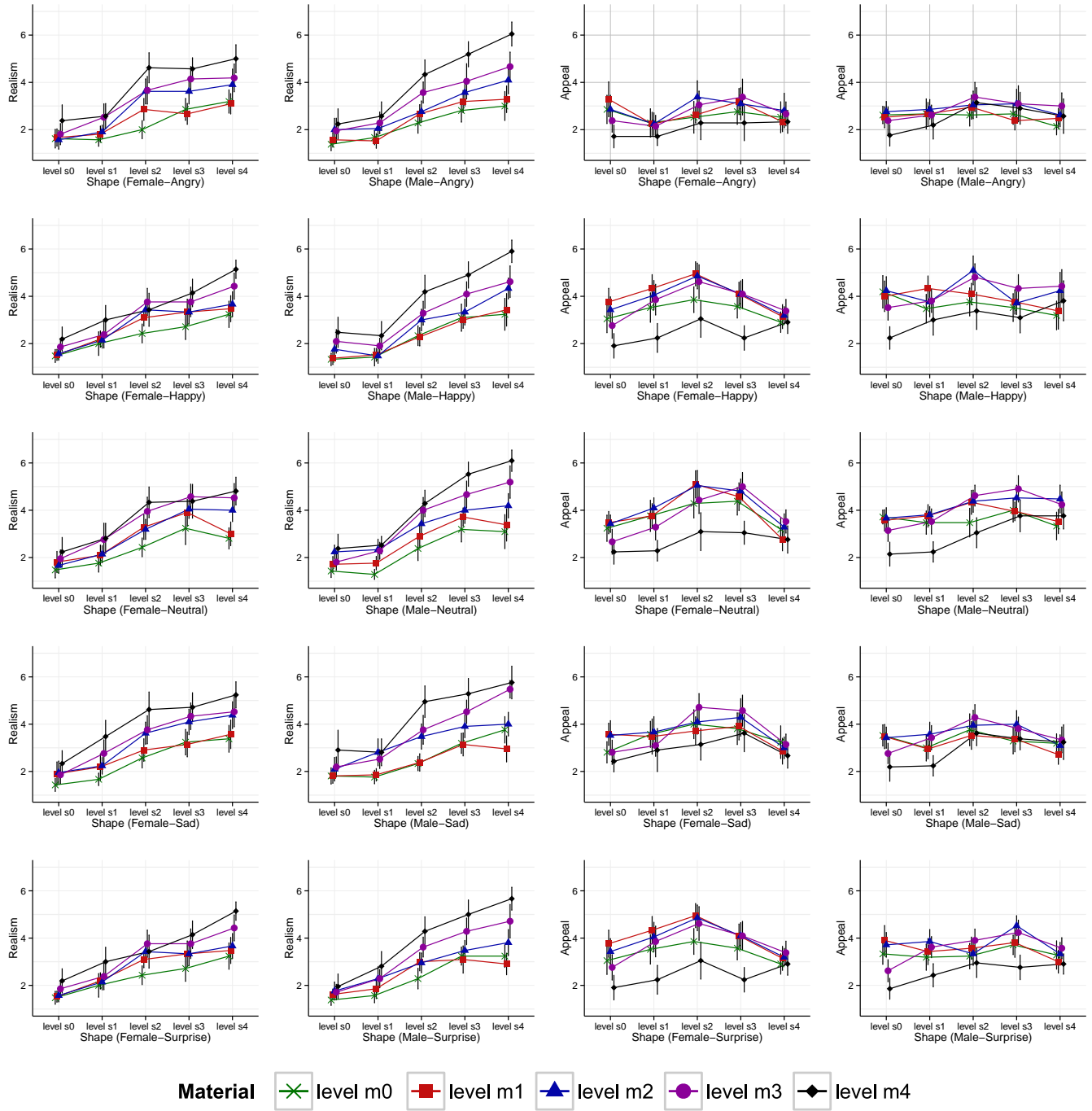


Figure C.6: *Results for Experiment 2: Ratings for perceived realism and appeal, separated by expression, male and female.*

C.4 Experiment 3: *Recognition and Intensity*

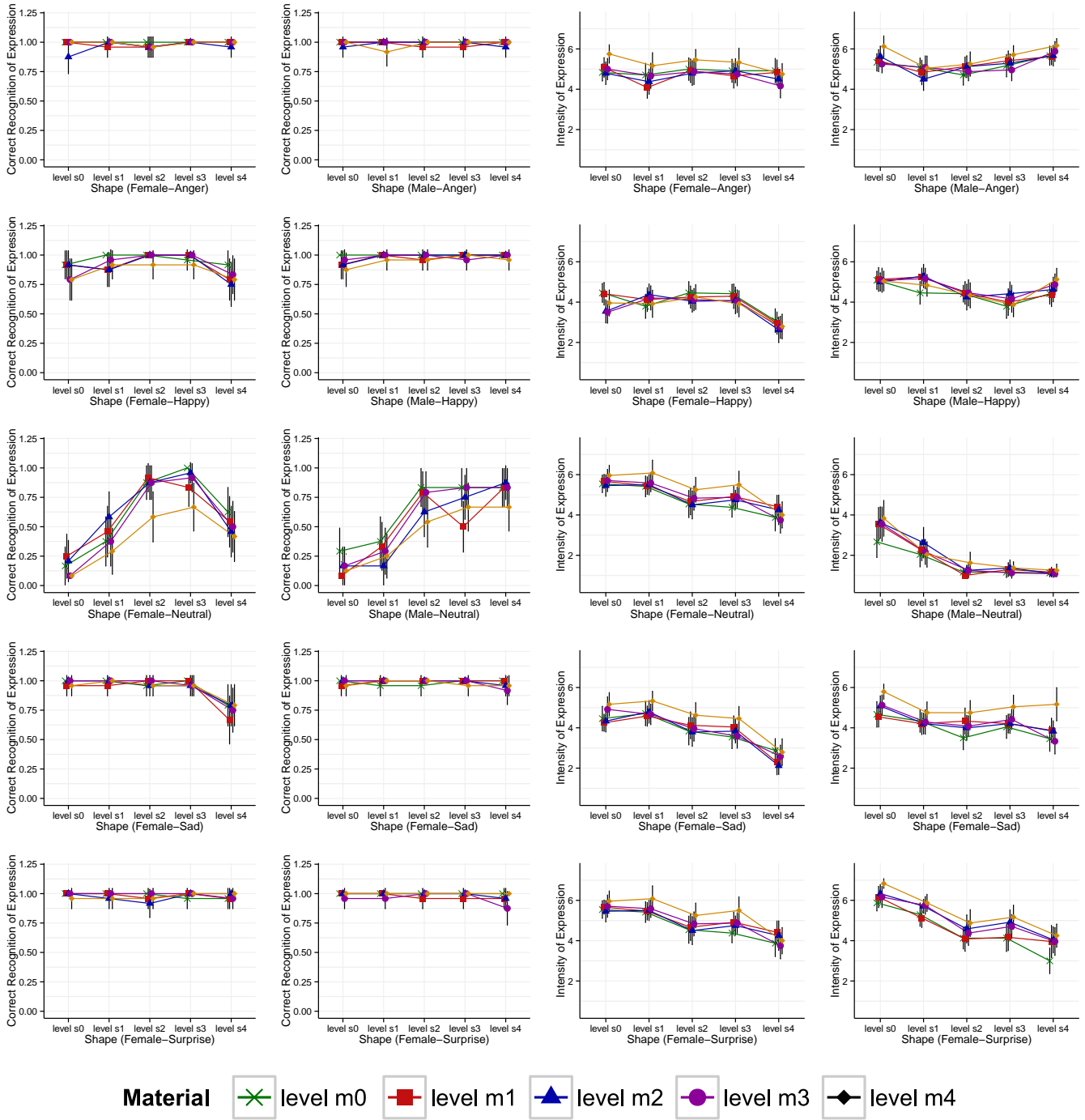


Figure C.7: Results for Experiment 3: Ratings for correct recognition and intensity, separated by expression male and female.

D Statistical Analysis of the Experiments

Here we include the complete set of tables summarizing the results of the analyses described in the main paper. The tables include repeated measures ANOVA to find significant values, Mauchly's test to evaluate the sphericity of the results, and the results of correcting such sphericity. We refer the reader to textbooks on experimental design for more details on these tests ¹. For all tests, we highlight the significant effects in **green**, and the non-significant in **red**. In particular, the content of this section is:

- **D.1** Experiment 1a: *Shape and Material*
 - **D.1.1** Appeal
 - **D.1.2** Reassurance
 - **D.1.3** Familiarity
 - **D.1.4** Realism
- **D.2** Experiment 1b: *Shading and Lighting*
 - **D.2.1** Appeal
 - **D.2.2** Reassurance
 - **D.2.3** Familiarity
 - **D.2.4** Realism
- **D.3** Experiment 1c: *Texture*
 - **D.3.1** Appeal
 - **D.3.2** Reassurance
 - **D.3.3** Attractiveness
 - **D.3.4** Realism
- **D.4** Experiment 2: *Further Investigation of Shape and Material*
 - **D.4.1** Appeal
 - **D.4.2** Realism
- **D.5** Experiment 3: *Effect of Expressions*
 - **D.5.1** Recognition
 - **D.5.2** Intensity

¹See for instance D. Cunningham and C. Wallraven: *Experimental Design: From User Studies to Psychophysics*, AK Peters/CRC Press 2011

D.1 Experiment 1a: *Shape and Material*

D.1.1 Appeal

Source	DFn	DFd	F	p
Shape	2	42	2.6423	0.0830
Material	2	42	42.6890	0.0000
Expression	4	84	33.1389	0.0000
Shape:Material	4	84	13.9734	0.0000
Shape:Expression	8	168	4.8828	0.0000
Material:Expression	8	168	4.0428	0.0002
Shape:Material:Expression	16	336	1.5289	0.0873

Table D.1: ANOVA results for Appeal on Experiment 1: Shape and Material.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.8847	0.2938	0.8966	0.0897
Material	0.5844	0.0046	0.7064	0.0000
Expression	0.3153	0.0080	0.6431	0.0000
Shape:Material	0.6053	0.3740	0.8188	0.0000
Shape:Expression	0.1386	0.4496	0.7032	0.0002
Material:Expression	0.1935	0.7331	0.7519	0.0010
Shape:Material:Expression	0.0000	0.0030	0.4993	0.1507

Table D.2: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Appeal on Experiment 1: Shape and Material.

D.1.2 Reassurance

Source	DFn	DFd	F	p
Shape	2	42	1.8529	0.1694
Material	2	42	49.0692	0.0000
Expression	4	84	24.6137	0.0000
Shape:Material	4	84	12.0185	0.0000
Shape:Expression	8	168	1.8039	0.0795
Material:Expression	8	168	2.4801	0.0144
Shape:Material:Expression	16	336	1.7032	0.0444

Table D.3: ANOVA results for Reassurance on Experiment 1a: Shape and Material.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.8337	0.1623	0.8574	0.1758
Material	0.6751	0.0197	0.7548	0.0000
Expression	0.3776	0.0267	0.6518	0.0000
Shape:Material	0.6869	0.6089	0.8569	0.0000
Shape:Expression	0.1531	0.5351	0.6856	0.1109
Material:Expression	0.0659	0.0626	0.6472	0.0344
Shape:Material:Expression	0.0000	0.0618	0.4669	0.1068

Table D.4: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Reassurance on Experiment 1a: Shape and Material.

D.1.3 Familiarity

Source	DFn	DFd	F	p
Shape	2	42	1.4128	0.2548
Material	2	42	12.5750	0.0001
Expression	4	84	8.7987	0.0000
Shape:Material	4	84	17.9849	0.0000
Shape:Expression	8	168	2.9823	0.0038
Material:Expression	8	168	0.8769	0.5373
Shape:Material:Expression	16	336	1.3009	0.1939

Table D.5: ANOVA results for Familiarity on Experiment 1a: Shape and Material.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.4206	0.0002	0.6332	0.2529
Material	0.7790	0.0823	0.8190	0.0002
Expression	0.4967	0.1397	0.7690	0.0000
Shape:Material	0.7374	0.7499	0.8669	0.0000
Shape:Expression	0.0362	0.0063	0.6878	0.0117
Material:Expression	0.0585	0.0416	0.6209	0.4988
Shape:Material:Expression	0.0000	0.0346	0.4726	0.2495

Table D.6: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Familiarity on Experiment 1a: Shape and Material.

D.1.4 Realism

Source	DFn	DFd	F	p
Shape	2	42	113.1847	0.0000
Material	2	42	23.1478	0.0000
Expression	4	84	1.2827	0.2833
Shape:Material	4	84	11.1444	0.0000
Shape:Expression	8	168	2.9403	0.0042
Material:Expression	8	168	1.2430	0.2770
Shape:Material:Expression	16	336	0.9535	0.5080

Table D.7: ANOVA results for Realism on Experiment 1a: Shape and Material.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.8993	0.3458	0.9085	0.0000
Material	0.6377	0.0111	0.7340	0.0000
Expression	0.4798	0.1152	0.7013	0.2886
Shape:Material	0.6163	0.4040	0.8343	0.0000
Shape:Expression	0.1026	0.2321	0.6761	0.0132
Material:Expression	0.2182	0.8206	0.7157	0.2904
Shape:Material:Expression	0.0000	0.0508	0.5527	0.4793

Table D.8: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Realism on Experiment 1a: Shape and Material.

D.2 Experiment 2: *Shading and Lighting*

D.2.1 Appeal

Source	DFn	DFd	F	p
Illum	2	38	0.3664	0.6957
ShadingParam	1	19	0.0030	0.9570
Expression	4	76	22.2230	0.0000
Illum:ShadingParam	2	38	0.2000	0.8196
Illum:Expression	8	152	1.4155	0.1942
ShadingParam:Expression	4	76	0.2053	0.9347
Illum:ShadingParam:Expression	8	152	1.7778	0.0855

Table D.9: ANOVA results for Appeal on Experiment 1b: Shading and Lighting.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Illum	0.7966	0.1292	0.8310	0.6573
Expression	0.0401	0.0000	0.3833	0.0000
Illum:ShadingParam	0.6125	0.0121	0.7207	0.7470
Illum:Expression	0.0556	0.1039	0.6111	0.2269
ShadingParam:Expression	0.6810	0.6711	0.8333	0.9091
Illum:ShadingParam:Expression	0.0523	0.0874	0.5859	0.1299

Table D.10: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Appeal on Experiment 1b: Shading and Lighting.

D.2.2 Reassurance

Source	DFn	DFd	F	p
Illum	2	38	0.3028	0.7405
ShadingParam	1	19	2.1296	0.1608
Expression	4	76	18.6126	0.0000
Illum:ShadingParam	2	38	0.6540	0.5257
Illum:Expression	8	152	1.4700	0.1725
ShadingParam:Expression	4	76	0.1664	0.9548
Illum:ShadingParam:Expression	8	152	2.3829	0.0190

Table D.11: ANOVA results for Reassurance on Experiment 1b: Shading and Lighting.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Illum	0.9642	0.7202	0.9654	0.7330
Expression	0.0526	0.0000	0.4200	0.0000
Illum:ShadingParam	0.9679	0.7455	0.9689	0.5212
Illum:Expression	0.0559	0.1054	0.6213	0.2073
ShadingParam:Expression	0.6198	0.5038	0.8202	0.9312
Illum:ShadingParam:Expression	0.0912	0.3329	0.6320	0.0433

Table D.12: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Reassurance on Experiment 1b: Shading and Lighting.

D.2.3 Familiarity

Source	DFn	DFd	F	p
Illum	2	38	1.0862	0.3477
ShadingParam	1	19	0.0975	0.7582
Expression	4	76	5.1525	0.0010
Illum:ShadingParam	2	38	0.4889	0.6171
Illum:Expression	8	152	0.4865	0.8644
ShadingParam:Expression	4	76	1.4666	0.2207
Illum:ShadingParam:Expression	8	152	2.2279	0.0283

Table D.13: ANOVA results for Familiarity on Experiment 1b: Shading and Lighting.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Illum	0.7638	0.0885	0.8089	0.3379
Expression	0.1602	0.0002	0.5105	0.0100
Illum:ShadingParam	0.6506	0.0209	0.7411	0.5628
Illum:Expression	0.0240	0.0066	0.5377	0.7587
ShadingParam:Expression	0.5428	0.3038	0.7986	0.2309
Illum:ShadingParam:Expression	0.0453	0.0576	0.6655	0.0534

Table D.14: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Familiarity on Experiment 1b: Shading and Lighting.

D.2.4 Realism

Source	DFn	DFd	F	p
Illum	2	38	6.6592	0.0033
ShadingParam	1	19	0.8104	0.3793
Expression	4	76	3.7832	0.0074
Illum:ShadingParam	2	38	2.5727	0.0896
Illum:Expression	8	152	0.5443	0.8216
ShadingParam:Expression	4	76	3.1084	0.0200
Illum:ShadingParam:Expression	8	152	1.7507	0.0911

Table D.15: ANOVA results for Realism on Experiment 1b: Shading and Lighting.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Illum	0.8770	0.3069	0.8905	0.0048
Expression	0.4423	0.1171	0.7218	0.0165
Illum:ShadingParam	0.9454	0.6034	0.9482	0.0929
Illum:Expression	0.0598	0.1260	0.5954	0.7339
ShadingParam:Expression	0.5205	0.2537	0.7908	0.0307
Illum:ShadingParam:Expression	0.1814	0.8254	0.7367	0.1171

Table D.16: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Realism on Experiment 1b: Shading and Lighting.

D.3 Experiment 1c: *Texture*

D.3.1 Appeal

Source	DFn	DFd	F	p
Shape	2	40	2.3842	0.1051
Texture	4	80	27.1734	0.0000
Shape:Texture	8	160	4.9954	0.0000

Table D.17: ANOVA results for Appeal on Experiment 1c: Texture.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.3385	0.0000	0.6019	0.1316
Texture	0.0780	0.0000	0.4212	0.0000
Shape:Texture	0.0373	0.0152	0.5877	0.0006

Table D.18: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Appeal on Experiment 1c: Texture.

D.3.2 Reassurance

Source	DFn	DFd	F	p
Shape	2	40	0.9798	0.3842
Texture	4	80	24.5543	0.0000
Shape:Texture	8	160	2.6607	0.0091

Table D.19: ANOVA results for Reassurance on Experiment 1c: Texture.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.4573	0.0006	0.6482	0.3542
Texture	0.0315	0.0000	0.3594	0.0000
Shape:Texture	0.0503	0.0438	0.5935	0.0292

Table D.20: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Reassurance on Experiment 1c: Texture.

D.3.3 Attractiveness

Source	DFn	DFd	F	p
Shape	2	40	5.3568	0.0087
Texture	4	80	16.7227	0.0000
Shape:Texture	8	160	2.8776	0.0051

Table D.21: ANOVA results for Attractiveness on Experiment 1c: Texture.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ε	p
Shape	0.4954	0.0013	0.6646	0.0205
Texture	0.0439	0.0000	0.3908	0.0000
Shape:Texture	0.0991	0.2918	0.6604	0.0160

Table D.22: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Attractiveness on Experiment 1c: Texture.

D.3.4 Realism

Source	DFn	DFd	F	p
Shape	2	40	124.9822	0.0000
Texture	4	80	17.5237	0.0000
Shape:Texture	8	160	6.4167	0.0000

Table D.23: ANOVA results for Realism on Experiment 1c: Texture.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ε	p
Shape	0.4483	0.0005	0.6445	0.0000
Texture	0.5261	0.2253	0.7195	0.0000
Shape:Texture	0.0888	0.2269	0.6612	0.0000

Table D.24: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Realism on Experiment 1c: Texture.

D.4 Experiment 2: *Further Investigation on Shape and Material*

D.4.1 Appeal

Source	DFn	DFd	F	p
Shape	4	80	20.971	0.0000
Material	4	80	20.387	0.0000
Expression	4	80	19.347	0.0000
Character	1	20	0.144	0.7081
Shape:Material	16	320	14.292	0.0000
Shape:Expression	16	320	4.008	0.0000
Material:Expression	16	320	5.717	0.0000
Shape:Character	4	80	7.063	0.0001
Material:Character	4	80	9.848	0.0000
Expression:Character	4	80	7.529	0.0000
Shape:Material:Expression	64	1280	1.955	0.0000
Shape:Material:Character	16	320	2.308	0.0032
Shape:Expression:Character	16	320	6.702	0.0000
Material:Expression:Character	16	320	0.771	0.7184
Shape:Material:Expression:Character	64	1280	1.172	0.1711

Table D.25: ANOVA results for Appeal on Experiment 2: Further Investigation on Shape and Material.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.211	0.0008	0.645	0.0000
Material	0.029	0.0000	0.470	0.0000
Expression	0.039	0.0000	0.392	0.0000
Shape:Material	0.000	0.0000	0.379	0.0000
Shape:Expression	0.000	0.0936	0.463	0.0004
Shape:Character	0.449	0.0992	0.794	0.0003
Material:Character	0.804	0.9105	0.892	0.0000
Material:Expression	0.000	0.0006	0.441	0.0000
Expression:Character	0.611	0.4322	0.819	0.0001

Table D.26: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Appeal on Experiment 2: Further Investigation on Shape and Material. Corrections have been only computed for main effects and interactions of two factors. Interactions of more than two factors have been ignored because we neither rely at any in the paper, nor we could draw meaningful conclusions at any point.

D.4.2 Realism

Source	DFn	DFd	F	p
Shape	4	80	178.670	0.0000
Material	4	80	73.915	0.0000
Expression	4	80	10.378	0.0000
Character	1	20	1.426	0.2465
Shape:Material	16	320	11.586	0.0000
Shape:Expression	16	320	2.155	0.0064
Material:Expression	16	320	2.527	0.0011
Shape:Character	4	80	7.066	0.0001
Material:Character	4	80	9.081	0.0000
Expression:Character	4	80	0.387	0.8172
Shape:Material:Expression	64	1280	1.041	0.3899
Shape:Material:Character	16	320	3.521	0.0000
Shape:Expression:Character	16	320	1.363	0.1583
Material:Expression:Character	16	320	1.098	0.3554
Shape:Material:Expression:Character	64	1280	1.085	0.3050

Table D.27: ANOVA results for Realism on Experiment 2: Further Investigation on Shape and Material

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	1.099	0.0000	0.495	0.0000
Material	0.010	0.0000	0.332	0.0000
Expression	0.680	0.6279	0.851	0.0000
Shape:Material	0.000	0.0010	0.419	0.0000
Shape:Expression	0.000	0.0335	0.488	0.0350
Shape:Character	0.200	0.0005	0.664	0.0007
Material:Expression	0.000	0.2124	0.527	0.0112
Material:Character	0.783	0.8752	0.891	0.0000
Expression:Character	0.530	0.2327	0.776	0.7692

Table D.28: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Realism on Experiment 2: Further Investigation on Shape and Material. Corrections have been only computed for main effects and interactions of two factors. Interactions of more than two factors have been ignored because we neither rely at any in the paper, nor we could draw meaningful conclusions at any point.

D.5 Experiment 3: *Recognition and Intensity of Expression*

D.5.1 Recognition

Source	DFn	DFd	F	p
Shape	4	92	44.233	0.0000
Material	4	92	10.092	0.0000
Expression	4	92	73.986	0.0000
Character	1	23	9.961	0.0044
Shape:Material	16	368	1.041	0.4119
Shape:Expression	16	368	41.316	0.0000
Material:Expression	16	368	4.973	0.0000
Shape:Character	4	92	17.393	0.0000
Material:Character	4	92	0.933	0.4482
Expression:Character	4	92	4.288	0.0032
Shape:Material:Expression	64	1472	1.384	0.0258
Shape:Material:Character	16	368	1.360	0.1588
Shape:Expression:Character	16	368	6.765	0.0000
Material:Expression:Character	16	368	2.201	0.0050
Shape:Material:Expression:Character	64	1472	1.086	0.3022

Table D.29: ANOVA results for Recognition on Experiment 3: Recognition and Intensity of Expression.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.539	0.1535	0.770	0.0000
Material	0.624	0.3438	0.784	0.0000
Expression	0.002	0.0000	0.305	0.0000
Shape:Material	0.000	0.0325	0.545	0.4080
Shape:Expression	0.000	0.0000	0.285	0.0000
Material:Expression	0.000	0.0000	0.336	0.0002
Shape:Expression	0.000	0.0000	0.285	0.0000
Shape:Character	0.575	0.224	0.782	0.0000
Material:Character	0.735	0.6811	0.852	0.4378
Expression:Character	0.139	0.0000	0.557	0.0159

Table D.30: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Recognition on Experiment 3: Recognition and Intensity of Expression. Corrections have been only computed for main effects and interactions of two factors. Interactions of more than two factors have been ignored because we neither rely at any in the paper, nor we could draw meaningful conclusions at any point.

D.5.2 Intensity

Source	DFn	DFd	F	p
Shape	4	92	91.396	0.0000
Material	4	92	30.461	0.0000
Expression	4	92	204.647	0.0000
Character	1	23	95.057	0.0000
Shape:Material	16	368	1.145	0.3114
Shape:Expression	16	368	19.005	0.0000
Material:Expression	16	368	5.042	0.0000
Shape:Character	4	92	34.728	0.0000
Material:Character	4	92	11.698	0.0000
Expression:Character	4	92	19.553	0.0000
Shape:Material:Expression	64	1472	1.887	0.0000
Shape:Material:Character	16	368	2.127	0.0070
Shape:Expression:Character	16	368	9.864	0.0000
Material:Expression:Character	16	368	1.861	0.0228
Shape:Material:Expression:Character	64	1472	1.196	0.1411

Table D.31: ANOVA results for Intensity on Experiment 3: Recognition and Intensity of Expression.

Source	Mauchly's		Greenhouse-Geisser's	
	W	p	ϵ	p
Shape	0.2215	0.0002	0.528	0.0000
Material	0.3087	0.0029	0.618	0.0000
Expression	0.3237	0.0042	0.642	0.0000
Shape:Material	0.000	0.5051	0.569	0.3323
Shape:Expression	0.000	0.0000	0.361	0.0000
Shape:Character	0.583	0.2413	0.755	0.0000
Material:Character	0.702	0.5789	0.857	0.0000
Material:Expression	0.000	0.0820	0.494	0.0000
Expression:Character	0.400	0.0206	0.661	0.0000

Table D.32: Mauchly's test for sphericity and Greenhouse-Geisser corrections for Intensity on Experiment 3: Recognition and Intensity of Expression. Corrections have been only computed for main effects and interactions of two factors. Interactions of more than two factors have been ignored because we neither rely at any in the paper, nor we could draw meaningful conclusions at any point.