Multisensory Research

Crossmodal Texture Perception Is Illumination-Dependent

Karina Kangur¹, Martin Giesel¹, Julie M. Harris² and Constanze Hesse^{1,*}

¹ The School of Psychology, University of Aberdeen, Aberdeen, AB24 3FX, UK

² School of Psychology & Neuroscience, University of St Andrews, St Andrews, KY16 9JP, UK

*Corresponding author; e-mail: c.hesse@abdn.ac.uk

ORCID iDs: Giesel: 0000-0002-3832-7442; Harris: 0000-0002-3497-4503; Hesse: 0000-0002-4395-0781

Supplementary Material

A Intramodal Matching

Supplementary analysis of the data shown in Fig. 2A.¹

The count data was subjected to a 3 (matching condition: VV top, VV obl, TT) × 7 (grit rank: 1 to 7) repeated-measures analysis. The analysis revealed a main effect of grit rank, $F_{6,186} = 117.35$, p < 0.001, $\eta_p^2 = 0.79$, but no main effect of condition, $F_{2,62} = 0.216$, p = 0.81, $\eta_p^2 = 0.007$, or interaction effect, $F_{12,372} = 1.21$, p = 0.30, $\eta_p^2 = 0.038$.

Post-hoc analysis comparing match counts for the seven grit ranks are shown in Supplementary Table S1.

Table S1.	Pairwise	comparisons	for grit	rank	data.	Note	that the	Bonferr	oni-correct	ed alpha	level is
0.0024.											

Grit(<i>i</i>)	Grit(j)	Mean difference	SE	Sig.
1	2	-0.125	0.09	0.0161
	3	-2.583	0.22	<0.001**
	4	-2.698	0.22	<0.001**
	5	-0.521	0.18	0.006
	6	0.344	0.12	0.007
	7	0.427	0.12	=0.001*
2	3	-2.458	0.22	<0.001**
	4	-2.573	0.22	<0.001**
	5	-0.396	0.16	0.016

¹ Note that for very high and very low grit values, very few participants ever identified those stimuli as being a good match (i.e., five or six out of 32) meaning that many cells contain a 0 count.

	6	0.469	0.12	< 0.001*
	7	0.552	0.12	< 0.001**
3	4	-0.115	0.10	0.276
	5	2.063	0.22	<0.001**
	6	2.927	0.21	<0.001**
	7	3.010	0.20	<0.001**
4	5	2.177	0.21	<0.001**
	6	3.042	0.21	<0.001**
	7	3.125	0.21	<0.001**
5	6	0.865	0.14	<0.001**
	7	0.948	0.15	<0.001**
6	7	0.083	0.06	0.199

SE, standard error.

B Crossmodal Matching

Supplementary analysis for data shown in Fig. 3A, B.

The count data was subjected to a 2 (matching condition: VT vs TV) × 2 (illumination condition: top vs oblique) × 7 (grit rank: 1 to 7) repeated-measures analysis. The analysis revealed no main effect of matching condition, $F_{1,31} = 0.810$, p = 0.38, $\eta_p^2 = 0.025$, no main effect of illumination condition, $F_{1,31} = 3.702$, p = 0.064, $\eta_p^2 = 0.107$, but a significant main effect of grit rank, $F_{6,186} = 113.67$, p < 0.001, $\eta_p^2 = 0.79$. There were no two-way interaction effects between

matching condition and illumination, $F_{1,31} = 1.46$, p = 0.24, $\eta_p^2 = 0.045$, or illumination condition and grit value, $F_{6,186} = 2.04$, p = 0.088, $\eta_p^2 = 0.062$, but a significant two-way interaction between matching condition and grit value, $F_{6,186} = 10.37$, p < 0.001, $\eta_p^2 = 0.25$. Importantly, the two-way interaction cannot be meaningfully interpreted as there was a three-way interaction effect, $F_{6,186}$ =7.36, p < 0.001, $\eta_p^2 = 0.192$. This three-way interaction indicates that, as expected, the number of good matches identified for the different grit values changed differently in the two matching conditions depending on illumination (as confirmed by the two-way interaction on the mean matching ranks presented in the MS).

Post-hoc analysis on the *main effect* of grit rank comparing match counts for the seven grit ranks.

Table S2.	Pairwise	comparisons	for grit ran	k data. I	Note that	the Bonferr	oni-corrected	alpha level is
0.0024.								

Grit(<i>i</i>)	Grit(j)	Mean difference	SE	Sig.
1	2	-0.164	0.10	0.122
	3	-2.383	0.20	<0.001**
	4	-2.617	0.21	<0.001**
	5	-1.234	0.17	< 0.001**
	6	0.63	0.14	0.650
	7	0.352	0.11	0.004
2	3	-2.219	0.20	<0.001**
	4	-2.453	0.20	<0.001**
	5	-1.070	0.17	<0.001**
	6	0.227	0.17	0.184

7	0.516	0.15	= 0.001*
4	-0.234	0.10	0.032
5	1.148	0.18	<0.001**
6	2.445	0.21	<0.001**
7	2.734	0.18	<0.001**
5	1.383	0.16	<0.001**
6	2.680	0.18	<0.001**
7	2.969	0.15	<0.001**
6	1.297	0.14	<0.001**
7	1.586	0.14	<0.001**
7	0.289	0.08	<0.001**
	7 4 5 6 7 5 6 7 6 7 7 7	7 0.516 4 -0.234 5 1.148 6 2.445 7 2.734 5 1.383 6 2.680 7 2.969 6 1.297 7 1.586 7 0.289	7 0.516 0.15 4 -0.234 0.10 5 1.148 0.18 6 2.445 0.21 7 2.734 0.18 5 1.383 0.16 6 2.680 0.18 7 2.969 0.15 6 1.297 0.14 7 1.586 0.14 7 0.289 0.08

SE, standard error.