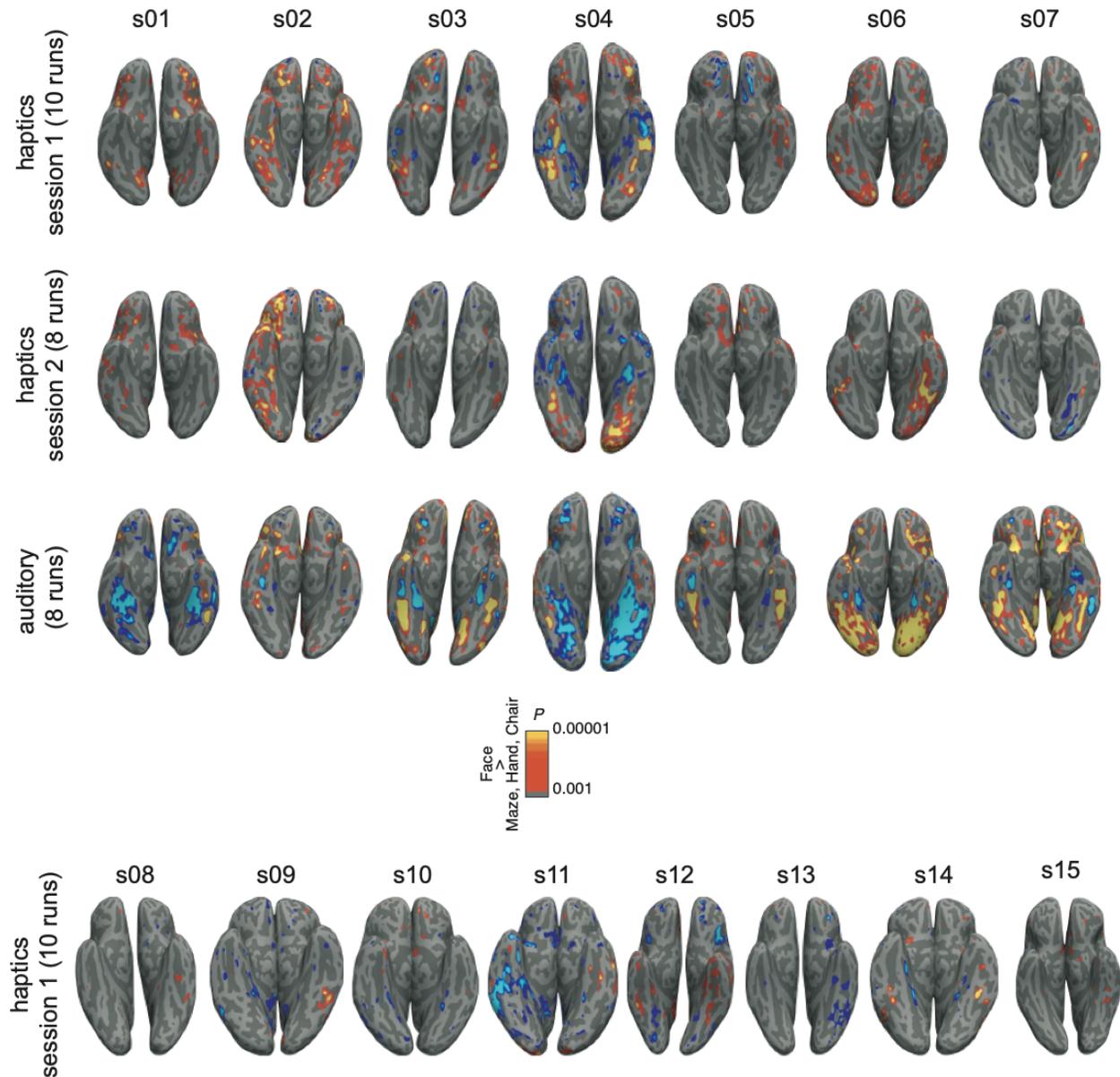
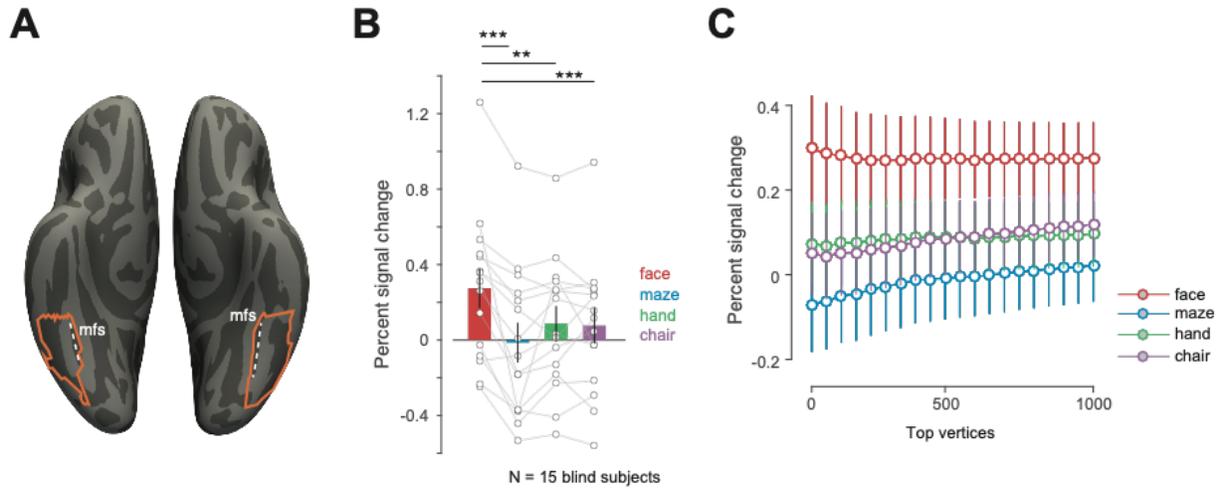


Supplementary Figures and Table



Supplementary Figure 1: Activations in individual blind participants. Inferior view of each subjects' native inflated surface reconstruction showing face-selective activations (Face > Body, Scene and Object, $P < 0.001$, uncorrected). Subjects s01 to s07 (above the colorbar) performed all 3 Experiments. The top row shows the face-selective activations for Experiment 1 (haptics), the middle row for Experiment 2 (haptics with additional stimuli- spheroids and cuboids, although these conditions were not included in the face selectivity statistics shown here) and bottom row for Experiment 3 (auditory).

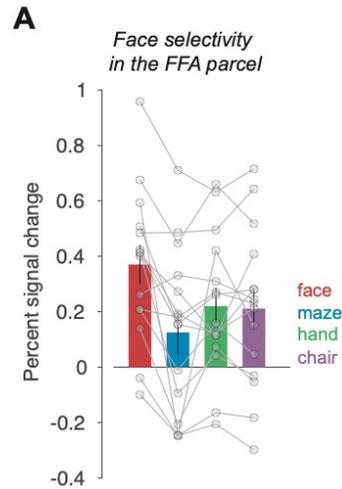


Supplementary Figure 2: A cytoarchitecture-based method to identify face selectivity in the fusiform.

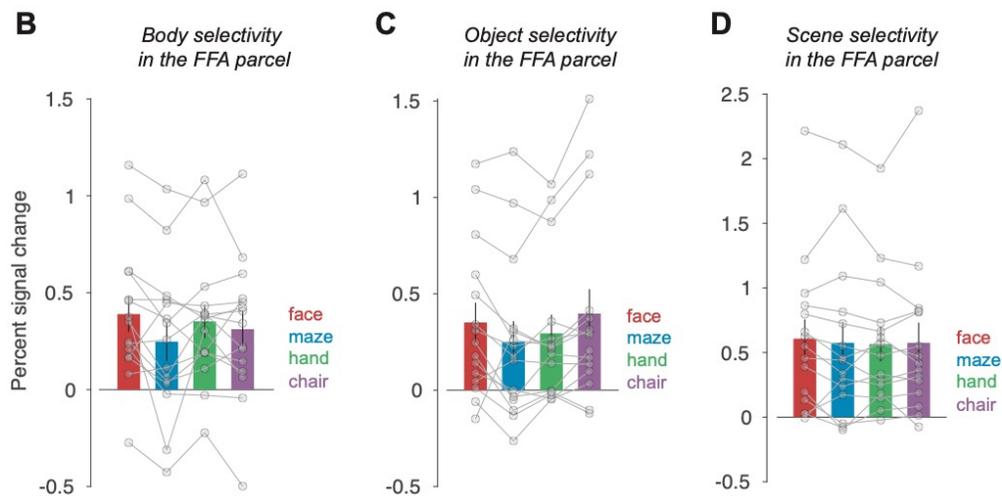
A. An alternate anatomical constraint region within which to define face-selective activations in the fusiform, hand-drawn based on Weiner et al (2014) on the fsaverage surface. This parcel extends from the lateral side of the mid-fusiform sulcus (mfs) posteriorly to the posterior end of the collateral sulcus (ptCoS)

B. Mean and s.e.m. of the fMRI BOLD response across blind subjects for the top 150 surface vertices (identified using independent data) during haptic exploration of 3D printed face, maze, hand and chair stimuli. ** is $P < 0.005$ and *** is $P < 0.0005$

C. Response profile of visual face-selective region (in held-out data) in blind subjects as a function of fROI size within the cytoarchitectonic-based anatomical constrain region in a (error bars indicate s.e.m.). The difference between face and object response magnitudes are statistically significant ($P < 0.005$, two-tailed paired t-test across subjects) at each fROI volume up to 1000 vertices.



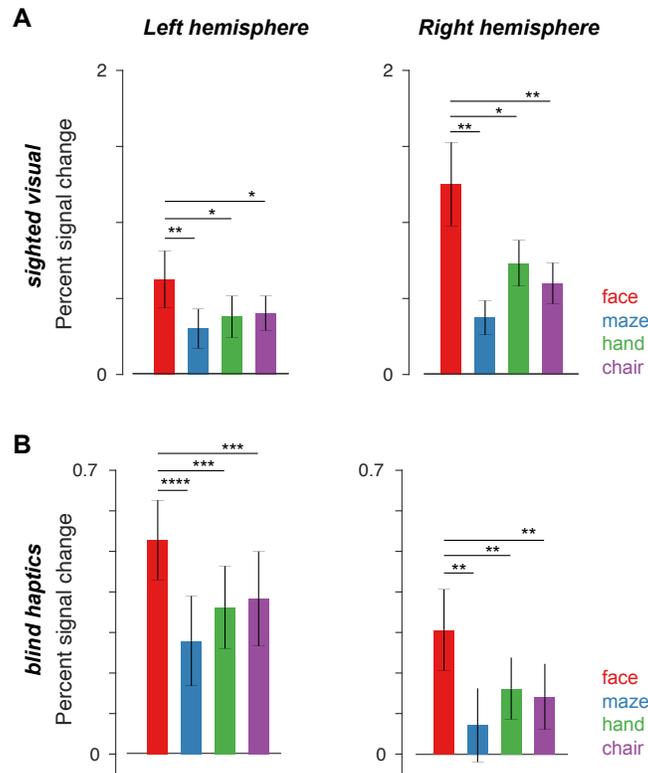
Negative controls - Other selectivities are not observed in the FFA parcel



Supplementary Figure 3: Negative controls for body, object and scene activations in group-constrained face parcels.

A. Mean and s.e.m. for the BOLD response across blind subjects in the top 50 face-selective voxels (identified in independent data) during haptic exploration of face, maze, hand and chair stimuli. Individual subject data are overlaid as connected lines (same format as **Figure 2K**)

B,C,D. Same as **A**, but for hand, chair and maze selectivity inside the face parcel. Note that none of these comparisons are statistically significant (all $P > 0.05$). This analysis indicates that our analysis method does not produce false positives, detecting selectivities that should not exist in that region. Instead, the face parcels evidently constrain the location to identify face-selective regions only and are not large enough to include regions selective for other object categories

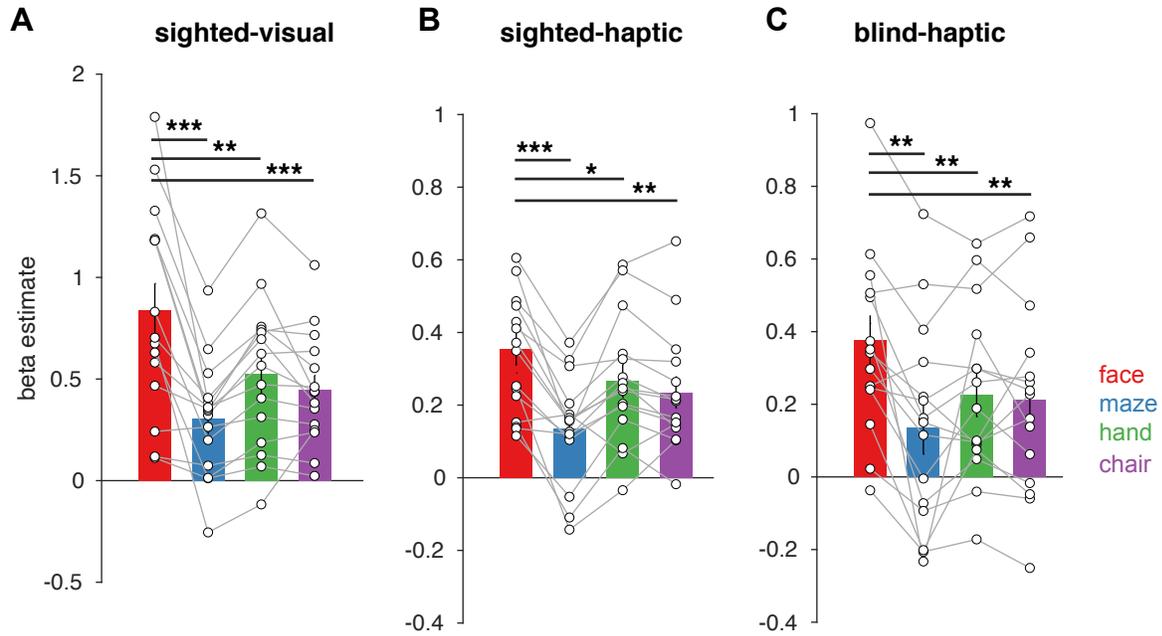


Supplementary Figure 4: Lateralization of face selective activations in sighted and blind subjects

A. Mean and s.e.m. for the BOLD response across sighted participants (N = 15) in the top 20 face-selective voxels (identified in independent data) in the left and right hemispheres (analyzed separately) during visual exploration of face, maze, hand and chair stimuli. * is $P < 0.05$, ** is $P < 0.005$, *** is $P < 0.0005$ and **** is $P < 0.00005$

B. Same as A. but in blind participants (N = 15) during haptic exploration of face, maze, hand and chair stimuli

A 3-way ANOVA on subject group (blind vs sighted), stimulus types (face, maze, hand and chair) and hemispheres (left and right) reveals a group by hemisphere interaction effect ($F(1,227)=15.71$, $P=0.0001$), indicating higher overall responses in the RH in sighted but in the LH in blind. However, there was no evidence of laterality differences between groups in selectivity: a) the triple interaction of group x hemisphere x stimulus condition was not close to significant ($F(3,224) = 0.8$, $P=0.50$), and b) a two-way ANOVA on selectivity index found no significant interaction of subject group by hemisphere ($F(1,56) = 0.27$, $P=0.60$) (and no main effect of either subject group, $F(1,56) = 1.65$, $P=0.20$ or hemisphere $F(1,56) = 2.44$, $P=0.12$)



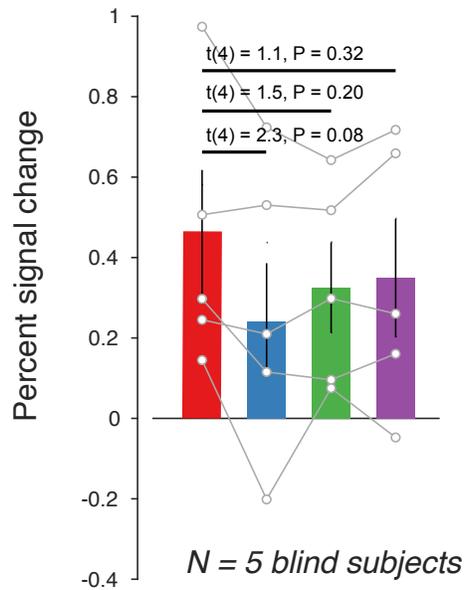
Supplementary Figure 5: Effect of normalization on face-selectivity in sighted and blind participants

A. Mean and s.e.m. of raw beta estimates (not normalized) for the stimulus conditions across sighted participants in the top 50 face-selective voxels (identified using independent data) during visual inspection of face, maze, hand and chair images. Individual subject data are overlaid as connected lines. * is $P < 0.05$, ** is $P < 0.005$ and **** is $P < 0.00005$

B. Same as **A**, but during haptic exploration of 3D-printed stimuli

C. Same as **B**, but for blind participants.

A



Supplementary Figure 6: Face selectivity in blind participants with no light perception. Mean and s.e.m. of fMRI BOLD response across blind subjects with no light perception ($N = 5$ subjects) in the top 50 face-selective voxels (identified using independent data) during visual inspection of face, maze, hand and chair images. Individual subject data are overlaid as connected lines.

Subject ID	Expt 1	Expt 2-3	Sex	Age	Severity	Etiology	Age of reported onset
1	x		F	37	Total	RoP	0
2	x		M	20	LP (L), Total (R)	RoP	0
3	x	x	M	31	Total	Anophthalmia (bilateral)	0
4	x		M	31	LP	Unknown	0
5	x		F	32	Total	Optic nerve hypoplasia	0
6	x		M	28	LP	LCA	0
7	x	x	F	30	LP	LCA	0
8	x	x	F	20	LP (L), Total (R)	RoP	0
9	x	x	F	28	LP	RP	0
10	x	x	M	18	LP	LCA	0
11	x		M	21	Total	Detached retina from birth (bilateral)	0
12	x		F	23	Total	RoP	0
13	x		M	39	LP	LCA	0
14	x	x	F	35	LP	LCA	0
15	x	x	M	34	LP	LCA	0

Supplementary Table : Blind participant details. Severity indicates level of blindness (for both eyes unless otherwise indicated). All recruited participants were congenitally blind.

LP – light perception

RoP – Retinopathy of prematurity, RP – Retinitis Pigmentosa, LCA – Leber’s Congenital Amaurosis