Supplemental Materials

# Domain-specific diaschisis: Lesions to parietal action areas modulate neural responses to tools in the ventral stream

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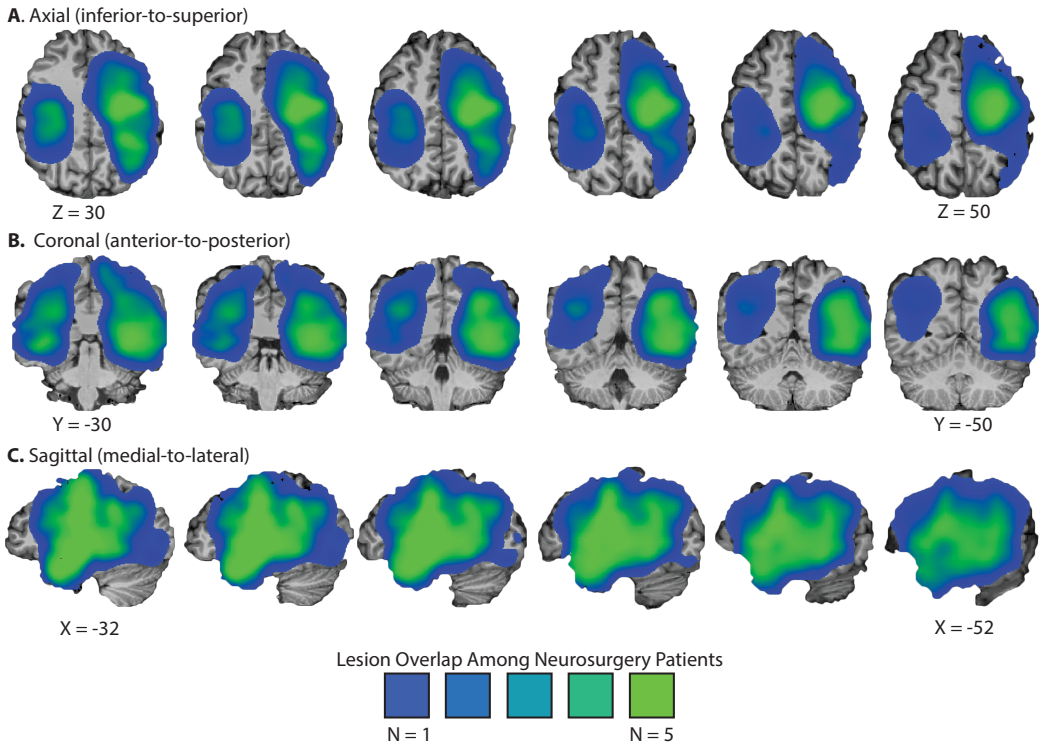
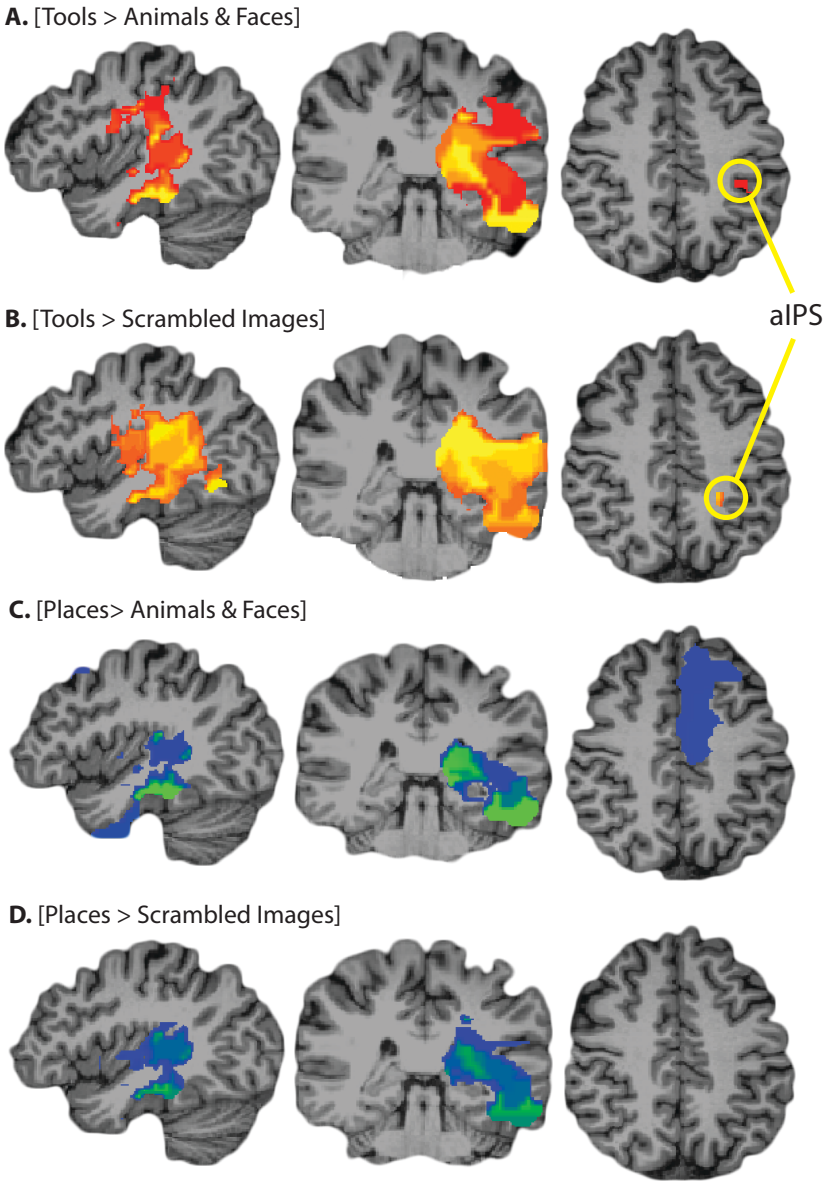
**Supplemental Figure 1**. Lesion distribution in neurosurgery patients



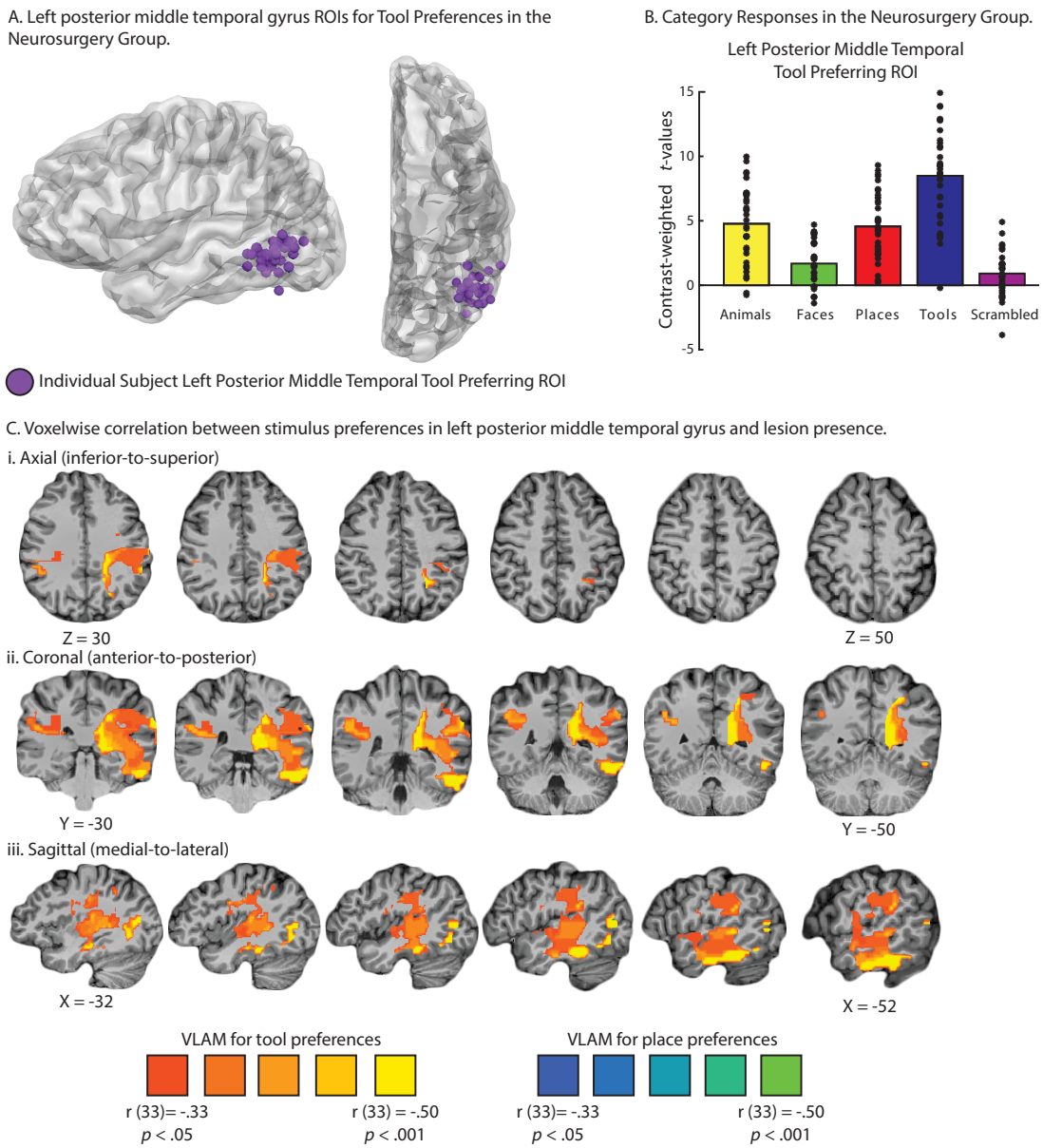

**Supplemental Figure 1. Lesion distribution in neurosurgery patients.** Voxel lesion overlap among the 35 neurosurgery patients. Lesions were identified using a high-resolution T1 dataset collected during each patient's first pre-operative fMRI scanning session. There is maximal overlap in the left anterior temporal lobe (and adjacent white matter voxels), in left frontal-motor cortex, and in the left anterior and inferior parietal lobe (and in adjacent white matter voxels inferior to the left inferior parietal lobule). Note that the lesion map is presented in radiological convention.

**Supplemental Figure 2.** The association of aIPS lesions with tool responses in ventral temporal cortex does not depend on the baseline.



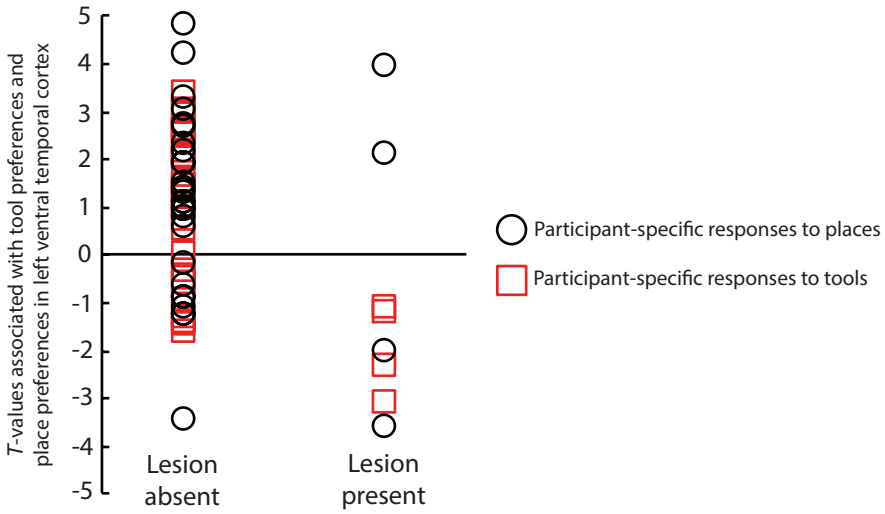

**Supplemental Figure 2.** The association of aIPS lesions with tool responses in ventral temporal cortex does not depend on the baseline used to calculate tool-preferences in ventral temporal cortex (**Panels A and B**). Lesions to structures in the left anterior and medial temporal lobe and the white matter medial to the left middle and superior temporal gyri are associated with weaker responses to tools (**A**-**B**) and places (**C**-**D**) in left ventral temporal cortex. Importantly, aIPS is not identified regardless of the baseline used for calculating place-preferences. All maps set to a minimum threshold of r(33) = -0.33, $p < .05$, uncorrected, and cluster-corrected using built-in BrainVoyager software (Alpha-sim, 1000 iterations). Note that the VLAM maps are presented in radiological convention.

**Supplemental Figure 3.** Voxel-based Lesion Activity Mapping (VLAM) demonstrates that lesions to aIPS modulate neural responses to tools in the left posterior middle temporal gyrus.




**Supplemental Figure 3. Voxel-based Lesion Activity Mapping (VLAM) showing that lesions to aIPS modulate neural responses to tools in the left posterior middle temporal gyrus. A.** Subject-specific left posterior middle temporal tool-preferring ROIs are represented as spheres (6 mm diameter). Subject-specific tool-preferring ROIs were defined using half of the data (e.g., even runs) from each participant, and the remaining half the data (i.e. odd runs) from that participant were used to calculate category-preferences at the single-subject level (with averaging across the data folds). **B.** Plotted in the bar graphs are contrast-weighted t-values for each category versus the fixation baseline. **C.** Lesions to the left supramarginal gyrus, left anterior intraparietal sulcus, adjacent white matter areas, and the left lateral and anterior temporal lobe are inversely correlated with tool preferences in left ventral temporal cortex (red-to-yellow color-scale). All partial (regressing lesion volume) correlation coefficient values plotted in the map survive cluster correction (cluster correction using AlphaSim, minimum cluster size of 191 voxels, with an initial alpha level of $p < .05$, uncorrected). Note that the VLAM maps are presented in radiological convention.

**Supplemental Figure 4.** Visualization of participant-specific tool- and place-preferences in left ventral temporal cortex as a function of lesion presence in an example aIPS voxel.




**Supplemental Figure 4. Visualization of participant-specific tool- and place-preferences in left ventral temporal cortex as a function of lesion presence in an example aIPS voxel.** Visualization of participant-specific tool- and place-preferences in left ventral temporal cortex as a function of lesion presence in an example aIPS voxel. The figure illustrates the dissociation between participant-specific tool (red squares) and place preferences (black circles).

**Supplemental Table 1.** Demographic information, lesion size, lesion location, and etiology for each neurosurgery patient participant.

| Participant | Age | Gender | Lesion Size (1 $mm^3$ voxels) | Lesion Location | Etiology |
|---|---|---|---|---|---|
| 1 | 60 | F | 14721 | Left Frontal-Parietal Cortex | Astrocytoma |
| 2 | 25 | M | 75072 | Left Inferior Parietal Cortex | Astrocytoma |
| 3 | 49 | F | 11193 | Left Middle Temporal Gyrus | Glioma |
| 4 | 34 | M | 5474 | Left Middle Temporal Gyrus | Cerebral Cavernoma |
| 5 | 43 | F | 12985 | Left Occipital Cortex | Arteriovenous Malformation |
| 6 | 42 | M | 48242 | Left Frontal-Motor Cortex | Anaplastic Astrocytoma |
| 7 | 53 | M | 29325 | Right Hippocampus | Anaplastic Astrocytoma |
| 8 | 48 | F | 69822 | Left Frontal/Pre-motor Cortex | Anaplastic Astrocytoma |
| 9 | 63 | M | 103125 | Left Frontal/Motor Cortex | Glioblastoma |
| 10 | 59 | M | 103966 | Left Anterior/Lateral Temporal Lobe | Glioblastoma |
| 11 | 59 | M | 67844 | Right Anterior Temporal Cortex | Anaplastic Astrocytoma |
| 12 | 26 | M | 16759 | Right Superior Temporal Sulcus | Astrocytoma |
| 13 | 66 | M | 28954 | Left Anterior Temporal Lobe | Anaplastic Astrocytoma |
| 14 | 70 | M | 15402 | Left Hippocampus | Glioma |
| 15 | 36 | F | 70914 | Left Lateral Temporal/ Inferior Frontal Cortex | Glioma |
| 16 | 25 | F | 3383 | Left Premotor Cortex | Cavernoma |
| 17 | 26 | M | 22334 | Left Posterior Parietal Cortex | Complex Partial Epilepsy w/o Status Epilepticus |
| 18 | 27 | M | 59126 | Right Anterior Temporal Cortex | Complex Partial Epilepsy w/o Status Epilepticus |
| 19 | 61 | F | 88604 | Right Anterior Temporal/ Frontal Cortex | Glioma |
| 20 | 36 | F | 36957 | Right Frontal-Motor Cortex | Oligodendroglioma |
| 21 | 65 | M | 25987 | Right Temporal/Parietal Cortex | Glioma |
| 22 | 26 | M | 76946 | Right Fronto-Parietal Cortex | Anaplastic Astrocytoma |
| 23 | 13 | F | 7540 | Left Hippocampus, Amygdala | Glioma |
| 24 | 55 | F | 41185 | Left Parietal Cortex | Glioblastoma |
| 25 | 42 | M | 122614 | Left Temporal/Parietal Lesion | Glioblastoma |
| 26 | 76 | M | 28576 | Left Anterior Temporal Lobe | Glioblastoma |
| 27 | 34 | M | 75939 | Left Frontal Cortex | Glioma |
| 28 | 65 | F | 67194 | Right Posterior Parietal Cortex | Glioblastoma |
| 29 | 28 | M | 42490 | Left Supplementary Motor Area | Oligodendroglioma |
| 30 | 59 | F | 15644 | Right Motor Cortex | Anaplastic Astrocytoma |
| 31 | 54 | M | 63750 | Left Posterior Parietal Cortex | Arteriovenous Malformation |
| 32 | 62 | F | 22274 | Left Frontal/Insular Cortex | Oligodendroglioma |
| 33 | 46 | F | 8637 | Left Amygdala/ Hippocampal | Glioma |
| 34 | 57 | M | 101897 | Left Temporal Lobe | Glioblastoma |
| 35 | 67 | M | 5520 | Left Anterior Intraparietal Sulcus | Glioma |