*Supplementary Material*

**to**

# "A functional MRI paradigm for efficient mapping of memory encoding across sensory conditions"

## 1 Behavioral results in older adults

To demonstrate the feasibility of our paradigm across the lifespan, a behavioral follow-up study in 21 adults over 30 years was conducted. The subsequent memory test took between 10 and 19 minutes (min). The auditory retrieval took on average 7.83 min (*SD* = 1.48, range 6.83-13.78 min) and visual retrieval 4.34 min (*SD* = 0.76, range 3.15-6.10 min). The subsequent memory performance, as defined by the Hit- and FA-rates, are listed in Table A.1 including paired t-tests. For each sensory and stimuli condition, the Hit-rate was significantly greater than the False Alarm (FA)-rate. The differences between the Hit-and FA-rates indicate that participants were able to remember items in this category.

**Table A.1 Memory performance**

| | Hit-rate | | FA-rate | | Hit-rate vs. FA-rate | | | *d'* | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *M* | *SD* | *t* | df | *p* | *M* | *SD* | *t* | df | *p* |
| Auditory | 0.52 | 0.19 | 0.25 | 0.12 | 8.12 | 20 | < 0.001 | 0.76 | 0.43 | | | |
| Visual | 0.62 | 0.11 | 0.18 | 0.12 | 13.77 | 20 | < 0.001 | 1.33 | 0.49 | | | |
| Auditory vs. Visual | | | | | | | | | | 5.48 | 20 | <0.001 |
| Environmental | 0.49 | 0.16 | 0.21 | 0.10 | 8.29 | 20 | < 0.001 | 0.83 | 0.44 | | | |
| Vocal | 0.55 | 0.23 | 0.29 | 0.17 | 6.82 | 20 | < 0.001 | 0.70 | 0.59 | | | |
| Environmental vs. Vocal | | | | | | | | | | 1.32 | 20 | 0.203 |
| Face | 0.58 | 0.14 | 0.22 | 0.16 | 9.80 | 20 | < 0.001 | 1.06 | 0.51 | | | |
| Scene | 0.65 | 0.16 | 0.13 | 0.11 | 15.47 | 20 | < 0.001 | 1.70 | 0.56 | | | |
| Face vs. Scene | | | | | | | | | | 6.56 | 20 | <0.001 |

Mean (*M*) and standard deviation (*SD*) for Hit-rate (percentage of correct old items), False Alarm (FA)-rate (percentage of incorrect new items) and d-prime (*d'*) (difference between z-standardized Hit- and FA-rate) (N = 21). Paired t-tests are used to depict differences between Hit- and FA-rate and between *d'* of sensory and stimuli conditions.
*Note*: df indicates the degrees of freedom, *t* indicated the t-value and *p* indicates the p-value representing the significance level.

Across all conditions we found a d-pime (*d'*) of 1.01 (*SD* = 0.38) and a response bias (*c*) of 0.32 (*SD* = 0.27) (auditory: *c* = 0.34 (*SD* = 0.43); visual: *c* = 0.36 (*SD* = 0.31)). The response bias indicated that participants were relatively conservative ($t(20) = 5.57$, $p < 0.001$) and thus more likely to rate items as "new". Paired t-tests indicated that memory was better for visual items compared with auditory items and for scene images better than for face images, but no there was no difference in memory performance between environmental and vocal stimuli (Table A.1).

Separated for presentation condition and over sensory conditions subsequent memory results showed for auditory stimuli in the older sample *d'* values of $M_{isolated} = 0.80$ ($SD_{isolated} = 0.59$) and $M_{parallel} = 0.68$ ($SD_{parallel} = 0.43$) and for visual stimuli in the older sample $M_{isolated} = 1.51$ ($SD_{isolated} = 0.56$) and

$M_{parallel}$ = 1.16 ($SD_{parallel}$ = 0.52). Results of a ANOVA confirmed a better subsequent memory performance for visual than for auditory stimuli independent of the presentation condition (isolated/parallel) (F(1,20) = 29.57, $p < 0.001$) also for the older sample. Also the presentation conditions showed a main effect indicating better subsequent memory for stimuli presented in isolation independent of the sensory modality (F(1,20) = 9.19, $p = 0.007$)). In contrast to the younger sample we did not find an interaction in this small older sample between sensory modality and the presentation condition (F(1,20) = 4.28, $p = 0.052$).

## 2 Association between age, memory performance and response bias

Across the lifespan, we found a negative correlation between age and memory performance, as measured by *d'* (r(79) = -0.31, $p = 0.005$) (Figure A.1). Within the group of young adults between age 19 and 30 (n = 60), we did not find a correlation between age and *d'* (r(58) = -0.08, $p = 0.519$). In contrast, within the group of adults older than 30 (n = 21), we found a negative correlation with age and *d'* (r(19) = -0.53, $p = 0.012$). Together, these findings confirm that age, especially in late life, is negatively associated with memory performance (e.g. 1).

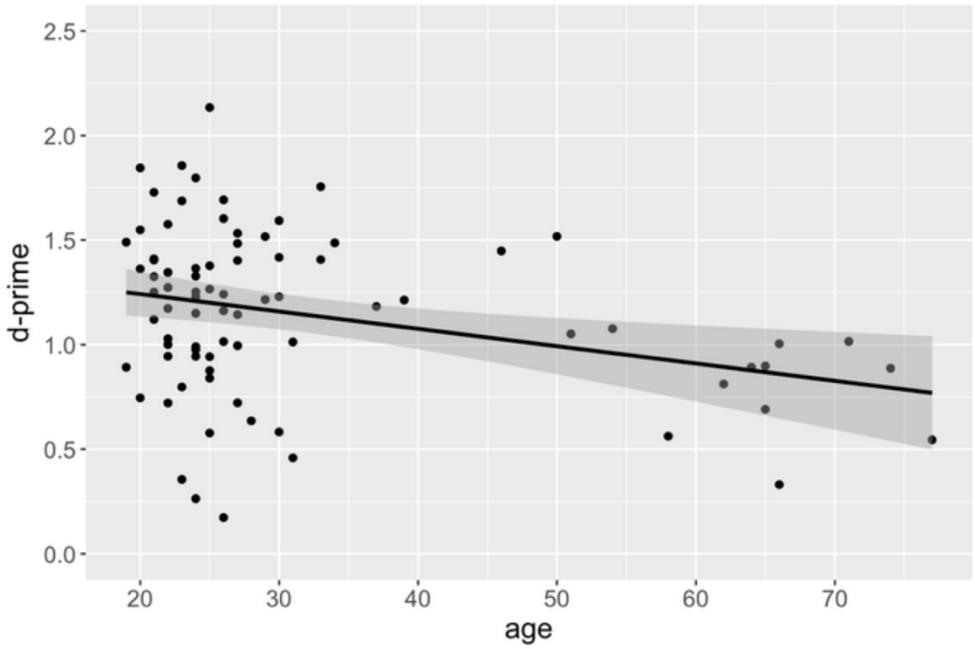


**Figure A.1.** Association between d-prime (z-standardized Hit-rate minus z-standardized FA-rate) and age (years).

Age and response bias were not correlated. Over all participants the correlation between age and response bias was r(79) = -0.03 ($p = 0.793$). Within the group of young adults between age 19 and 30 the correlation between age and response bias was r(58) = 0.05 ($p = 0.723$) and within the group of adults older than 30 the correlation between age and response bias was r(19) = -0.06, $p = 0.812$).

## 3 Sustained and transient deactivation

In addition to the pattern of sustained and transient activation in the manuscript we also examined the deactivation pattern. We mapped the block and event related activity from the mixed model analysis against the rest condition. For sustained auditory activity, we found the global minima in the right visual cortex (Figure A.2; c7). For the transient auditory activity, we found the minima in the right putamen (Figure A.2; c8). For sustained visual activity, we found the minima in the left temporoparietal junction (Figure A.2; c9). Finally, for transient visual activity, we found the minima in the left inferior temporal gyrus (Figure A.2; c10). For MNI coordinates and values see sustained (blocks) and transient (events) in manuscript Table 2.

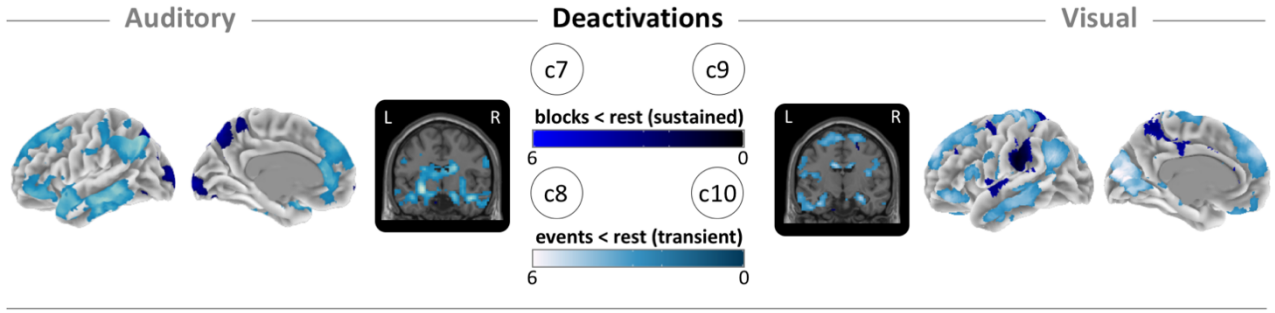


**Figure A.2.** Brain maps of block-related (sustained) and event-related (transient) deactivation. (c7) Auditory block versus rest deactivation (dark blue). (c8) Auditory event versus rest deactivation (light blue). (c9) Visual block versus rest deactivation (dark blue). (c10) Visual block versus rest deactivation (light blue). Brain activity is shown at a threshold of $p < 0.05$ (FDR-corrected) and the color intensity shows the t-value. Maps are uploaded under https://neurovault.org/collections/IABCOPVN/.

## 4 Cluster peaks for all contrasts

To elaborate on the contrast information, we included Table A.2 giving for all clusters with a minimum number of five voxels the cluster peak with the highest activation. All contrasts excluded activation in the cerebellum. As explained in the manuscript contrasts c2 and c3 were masked for auditory activity greater than visual activity (c1) and visual activity greater than auditory activity (c1) respectively. Clusters and cluster peaks were calculated using FIVE.m (https://habs.mgh.harvard.edu/researchers/data-tools/downloads/) an matlab integrated tool.

## Table A.2 Cluster peaks for all contrasts

| Contrast | | Sensory-Specific Activity<br>Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c1 | Auditory > Visual | 82 R. Superior Temporal Gyrus | 9242 | 54 | -1 | -13 | 9.89 | Right-BA22 |
| | | 31 L. Anterior Cingulate Cortex | 393 | -9 | 35 | 5 | 3.86 | Left-BA24 |
| | | 89 L. Inferior Temporal Gyrus | 46 | -51 | -34 | -25 | 3.49 | Left-BA20 |
| | | 8 R. Middle Frontal Gyrus | 38 | 27 | 20 | 35 | 2.97 | Right-BA8 |
| | | 7 L. Middle Frontal Gyrus | 27 | -27 | 17 | 38 | 2.94 | Left-BA8 |
| | | 58 R. Postcentral Gyrus | 8 | 36 | -43 | 71 | 2.88 | Right-PrimSensory (1) |
| | | 32 R. Anterior Cingulate Cortex | 10 | 6 | 17 | 29 | 2.72 | Right-BA32 |
| | | 11 L. Inferior Frontal Operculum | 10 | -39 | 11 | 23 | 2.39 | Left-BA44 |
| c1 | Visual > Auditory | 43 L. Calcarine Sulcus | 10987 | -3 | -91 | -4 | 13.13 | Left-VisualAssoc (18) |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 59 | -9 | 68 | -7 | 3.21 | Left-BA10 |
| | | 31 L. Anterior Cingulate Cortex | 36 | -3 | 5 | 26 | 3.17 | Left-BA24 |
| | | 3 L. Superior Frontal Gyrus | 39 | -9 | 62 | 35 | 3.15 | Left-BA9 |
| | | 4 R. Superior Frontal Gyrus | 19 | 21 | 68 | 11 | 2.83 | Right-BA10 |
| | | 9 L. Middle Frontal Gyrus - Orbital Part | 12 | -36 | 56 | -16 | 2.72 | Left-BA10 |
| | | 56 R. Fusiform Gyrus | 6 | 27 | -4 | -43 | 2.70 | Right-BA20 |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 8 | -12 | 38 | -25 | 2.66 | Left-BA11 |
| | | 56 R. Fusiform Gyrus | 6 | 42 | -13 | -31 | 2.55 | Right-BA20 |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 5 | -18 | 50 | -19 | 2.42 | Left-BA11 |
| c2 | Environmental > Vocal | 64 R. SupraMarginal Gyrus | 158 | 57 | -28 | 32 | 3.78 | Right-BA40 |
| | | 31 L. Anterior Cingulate Cortex | 93 | -6 | 35 | 8 | 3.54 | Left-BA24 |
| | | 30 R. Insula | 119 | 39 | 14 | -7 | 3.34 | Right-Insula (13) |
| | | 29 L. Insula | 27 | -36 | 17 | 8 | 3.18 | Left-BA45 |
| | | 81 L. Superior Temporal Gyrus | 32 | -42 | -16 | -10 | 3.13 | Left-BA22 |
| | | 32 R. Anterior Cingulate Cortex | 46 | 9 | 23 | 26 | 3.10 | Right-BA32 |
| | | 63 L. SupraMarginal Gyrus | 42 | -45 | -37 | 29 | 3.07 | Left-BA40 |
| | | 34 R. Middle Cingulate Cortex | 12 | 18 | -31 | 41 | 2.71 | Right-SensoryAssoc (5) |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c2 | Environmental > Vocal | 82 R. Superior Temporal Gyrus | 6 | 42 | -22 | 2 | 2.64 | Right-PrimAuditory (41) |
| c2 | Vocal > Environmental | 82 R. Superior Temporal Gyrus | 8321 | 63 | -1 | -10 | 11.65 | Right-BA22 |
| | | 1 L. Precentral Gyrus | 474 | -54 | -1 | 47 | 4.68 | Left-BA6 |
| | | 2 R. Precentral Gyrus | 367 | 58 | 0 | 42 | 4.34 | Right-BA6 |
| | | 28 R. Gyrus Rectus | 184 | 3 | 47 | -16 | 4.25 | Right-BA11 |
| | | 37 L. Hippocampus | 42 | -18 | -31 | -1 | 3.62 | Left-Thalamus (50) |
| | | 4 R. Superior Frontal Gyrus | 52 | 15 | -10 | 77 | 3.58 | Right-BA6 |
| | | 59 L. Superior Parietal Lobule | 74 | -24 | -61 | 62 | 3.48 | Left-BA7 |
| | | 23 L. Superior Frontal Gyrus - Medial Part | 65 | -6 | 59 | 32 | 3.41 | Left-BA9 |
| | | 57 L. Postcentral Gyrus | 30 | -33 | -31 | 71 | 3.38 | Left-PrimSensory (1) |
| | | 2 R. Precentral Gyrus | 43 | 45 | -19 | 65 | 3.27 | Right-BA6 |
| | | 60 R. Superior Parietal Lobule | 12 | 15 | -79 | 56 | 3.20 | Right-BA7 |
| | | 60 R. Superior Parietal Lobule | 69 | 24 | -64 | 68 | 3.17 | Right-BA7 |
| | | 19 L. Supplementary Motor Area | 30 | -12 | 5 | 74 | 3.04 | Left-BA6 |
| | | 72 R. Caudate | 21 | 15 | -1 | 29 | 3.02 | Right-BA24 |
| | | 67 L. Precuneus | 57 | -6 | -40 | 74 | 2.98 | Left-SensoryAssoc (5) |
| | | 44 R. Calcarine Sulcus | 5 | 27 | -58 | 11 | 2.88 | Right-BA23 |
| | | 68 R. Precuneus | 7 | 15 | -52 | 23 | 2.84 | Right-BA23 |
| | | 4 R. Superior Frontal Gyrus | 6 | 27 | 35 | 53 | 2.75 | Right-BA8 |
| | | 58 R. Postcentral Gyrus | 10 | 21 | -37 | 77 | 2.70 | Right-SensoryAssoc (5) |
| | | 16 R. Inferior Frontal Gyrus - Orbital Part | 7 | 54 | 32 | -10 | 2.60 | Right-BA47 |
| | | 19 L. Supplementary Motor Area | 7 | -3 | 14 | 62 | 2.52 | Left-BA6 |
| c3 | Face > Scene | 55 L. Fusiform Gyrus | 7350 | -42 | -49 | -22 | 8.17 | Left-Fusiform (37) |
| | | 28 R. Gyrus Rectus | 235 | 6 | 50 | -19 | 4.93 | Right-BA11 |
| | | 1 L. Precentral Gyrus | 186 | -30 | -4 | 32 | 3.69 | Left-BA6 |
| | | 2 R. Precentral Gyrus | 100 | 54 | 5 | 47 | 3.69 | Right-BA6 |
| | | 76 R. Pallidum | 514 | 18 | 8 | 2 | 3.14 | Right-Putamen (49) |
| | | 7 L. Middle Frontal Gyrus | 87 | -36 | 20 | 56 | 3.05 | Left-BA8 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c3 | Face > Scene | 23 L. Superior Frontal Gyrus - Medial Part | 91 | -6 | 62 | 32 | 3.02 | Left-BA10 |
| | | 36 R. Posterior Cingulate Cortex | 36 | 15 | -34 | 20 | 2.84 | Right-Caudate (48) |
| | | 89 L. Inferior Temporal Gyrus | 61 | -33 | -10 | -43 | 2.76 | Left-BA20 |
| | | 7 L. Middle Frontal Gyrus | 79 | -39 | 41 | 35 | 2.44 | Left-BA9 |
| | | 87 L. Middle Temporal Pole | 9 | -39 | 17 | -43 | 2.43 | Left-BA38 |
| | | 11 L. Inferior Frontal Operculum | 31 | -60 | 11 | 23 | 2.40 | Left-BA44 |
| | | 66 R. Angular Gyrus | 6 | 45 | -70 | 50 | 2.35 | Right-BA39 |
| | | 19 L. Supplementary Motor Area | 6 | -6 | 23 | 65 | 2.32 | Left-BA6 |
| | | 12 R. Inferior Frontal Operculum | 11 | 27 | 2 | 32 | 2.20 | Right-BA8 |
| | | 48 R. Lingual Gyrus | 8 | 3 | -34 | 5 | 2.17 | Right-Thalamus (50) |
| | | 1 L. Precentral Gyrus | 5 | -54 | -4 | 50 | 2.17 | Left-BA6 |
| | | 57 L. Postcentral Gyrus | 8 | -66 | -19 | 35 | 1.98 | Left-PrimSensory (1) |
| | | 11 L. Inferior Frontal Operculum | 5 | -48 | 20 | 35 | 1.90 | Left-BA8 |
| c3 | Scene > Face | 55 L. Fusiform Gyrus | 11769 | -27 | -49 | -7 | 24.08 | Left-BA19 |
| | | 77 L. Thalamus | 15 | -15 | -7 | -1 | 3.18 | Left-GlobPal (51) |
| | | 7 L. Middle Frontal Gyrus | 14 | -21 | 5 | 53 | 2.78 | Left-BA6 |
| | | 76 R. Pallidum | 14 | 21 | -7 | -1 | 2.72 | Right-GlobPal (51) |
| | | 39 L. Parahippocampal Gyrus | 8 | -6 | 5 | -25 | 2.66 | Left-Amygdala (53) |
| | | 26 R. Medial Surface of the Frontal Lobe - Orbital Part | 5 | 12 | 59 | -4 | 2.44 | Right-BA10 |
| | | 27 L. Gyrus Rectus | 8 | -9 | 23 | -16 | 2.33 | Left-BA11 |
| | | 90 R. Inferior Temporal Gyrus | 14 | 54 | -55 | -10 | 2.27 | Right-Fusiform (37) |
| | | 9 L. Middle Frontal Gyrus - Orbital Part | 10 | -33 | 38 | -13 | 2.24 | Left-BA47 |
| | | 71 L. Caudate | 17 | -6 | 17 | -4 | 2.23 | Left-Caudate (48) |
| | | 17 L. Rolandic Operculum | 11 | -42 | -19 | 23 | 2.13 | Left-PrimSensory (1) |
| | | 57 L. Postcentral Gyrus | 15 | -42 | -28 | 56 | 2.10 | Left-PrimSensory (1) |
| | | **Encoding Success Activity (ESA) for isolated blocks** | | | | | | |
| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
| c4 | positive ESA | 40 R. Parahippocampal Gyrus | 279 | 21 | -7 | -25 | 6.09 | Right-Parahip (36) |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c4 | positive ESA | 37 L. Hippocampus | 336 | -24 | -10 | -19 | 5.90 | Left-Hippocampus (54) |
| | | 82 R. Superior Temporal Gyrus | 182 | 45 | -37 | 5 | 5.81 | Right-BA21 |
| | | 52 R. Middle Occipital Gyrus | 456 | 33 | -91 | 8 | 4.79 | Right-VisualAssoc (18) |
| | | 15 L. Inferior Frontal Gyrus - Orbital Part | 169 | -39 | 32 | -10 | 4.63 | Left-BA47 |
| | | 53 L. Inferior Occipital Gyrus | 615 | -27 | -91 | -7 | 4.53 | Left-VisualAssoc (18) |
| | | 6 R. Superior Frontal Gyrus - Orbital Part | 64 | 21 | 35 | -13 | 4.51 | Right-BA11 |
| | | 85 L. Middle Temporal Gyrus | 305 | -60 | -28 | -1 | 4.42 | Left-BA22 |
| | | 28 R. Gyrus Rectus | 221 | 6 | 44 | -19 | 4.01 | Right-BA11 |
| | | 11 L. Inferior Frontal Operculum | 102 | -42 | 14 | 23 | 3.93 | Left-BA44 |
| | | 14 R. Inferior Frontal Gyrus - pars triangulars | 112 | 45 | 35 | 2 | 3.80 | Right-BA46 |
| | | 82 R. Superior Temporal Gyrus | 11 | 60 | -1 | -10 | 3.39 | Right-BA22 |
| | | 55 L. Fusiform Gyrus | 6 | -30 | -1 | -49 | 3.12 | Left-BA38 |
| | | 1 L. Precentral Gyrus | 13 | -54 | -1 | 50 | 3.05 | Left-BA6 |
| | | 2 R. Precentral Gyrus | 11 | 57 | -1 | 50 | 2.99 | Right-BA6 |
| c4 | negative ESA | 68 R. Precuneus | 2802 | 9 | -70 | 44 | -6.37 | Right-BA7 |
| | | 4 R. Superior Frontal Gyrus | 1274 | 27 | 65 | 8 | -5.37 | Right-BA10 |
| | | 7 L. Middle Frontal Gyrus | 591 | -30 | 38 | 38 | -4.39 | Left-BA9 |
| | | 62 R. Inferior Parietal Lobule | 757 | 54 | -49 | 41 | -4.32 | Right-BA39 |
| | | 72 R. Caudate | 60 | 9 | 20 | -4 | -4.04 | Right-Caudate (48) |
| | | 63 L. SupraMarginal Gyrus | 451 | -63 | -37 | 41 | -3.97 | Left-BA40 |
| | | 7 L. Middle Frontal Gyrus | 183 | -21 | 8 | 53 | -3.79 | Left-BA6 |
| | | 30 R. Insula | 39 | 36 | 11 | 11 | -3.63 | Right-BA44 |
| | | 71 L. Caudate | 66 | -15 | 23 | -4 | -3.62 | Left-Caudate (48) |
| | | 32 R. Anterior Cingulate Cortex | 33 | 6 | 41 | -1 | -3.59 | Right-BA32 |
| | | 89 L. Inferior Temporal Gyrus | 6 | -57 | -31 | -31 | -3.56 | Left-BA20 |
| | | 34 R. Middle Cingulate Cortex | 149 | 6 | 38 | 32 | -3.45 | Right-BA8 |
| | | 29 L. Insula | 8 | -36 | 8 | 11 | -3.40 | Left-BA44 |
| | | 90 R. Inferior Temporal Gyrus | 23 | 54 | -19 | -37 | -3.39 | Right-BA20 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c4 | negative ESA | 85 L. Middle Temporal Gyrus | 11 | -63 | -61 | -4 | -3.14 | Left-Fusiform (37) |
| | | 80 R. Heschls Gyrus | 25 | 51 | -10 | 8 | -3.14 | Right-PrimAuditory (41) |
| | | 30 R. Insula | 14 | 33 | 20 | -19 | -3.04 | Right-BA47 |
| | | 46 R. Cuneus | 9 | 15 | -82 | 26 | -2.99 | Right-BA19 |
| | | 82 R. Superior Temporal Gyrus | 6 | 45 | -7 | -7 | -2.93 | Right-Insula (13) |
| | | 71 L. Caudate | 7 | -9 | -1 | 20 | -2.87 | Left-Caudate (48) |
| | | 57 L. Postcentral Gyrus | 6 | -21 | -28 | 77 | -2.73 | Left-PrimSensory (1) |
| | | 7 L. Middle Frontal Gyrus | 7 | -45 | 20 | 47 | -2.72 | Left-BA8 |
| | | 71 L. Caudate | 5 | -9 | 17 | 17 | -2.57 | Left-Caudate (48) |
| c5 | positive auditory ESA | 85 L. Middle Temporal Gyrus | 709 | -60 | -13 | -4 | 5.72 | Left-BA22 |
| | | 82 R. Superior Temporal Gyrus | 635 | 57 | -25 | -1 | 5.63 | Right-BA22 |
| | | 15 L. Inferior Frontal Gyrus - Orbital Part | 138 | -36 | 35 | -10 | 4.94 | Left-BA47 |
| | | 41 L. Amygdala | 119 | -33 | 2 | -28 | 4.56 | Left-BA38 |
| | | 84 R. Superior Temporal Pole | 29 | 36 | 5 | -25 | 4.27 | Right-BA38 |
| | | 16 R. Inferior Frontal Gyrus - Orbital Part | 51 | 48 | 32 | -4 | 3.96 | Right-BA47 |
| | | 14 R. Inferior Frontal Gyrus - pars triangulars | 38 | 39 | 20 | 20 | 3.79 | Right-BA44 |
| | | 6 R. Superior Frontal Gyrus - Orbital Part | 23 | 24 | 32 | -13 | 3.53 | Right-BA47 |
| | | 27 L. Gyrus Rectus | 45 | 0 | 41 | -22 | 3.51 | Right-BA11 |
| | | 38 R. Hippocampus | 16 | 24 | -7 | -19 | 3.49 | Right-Hippocampus (54) |
| | | 11 L. Inferior Frontal Operculum | 25 | -45 | 11 | 20 | 3.35 | Left-BA44 |
| | | 46 R. Cuneus | 27 | 15 | -103 | 8 | 3.24 | Right-VisualAssoc (18) |
| | | 1 L. Precentral Gyrus | 5 | -54 | -1 | 50 | 2.97 | Left-BA6 |
| | | 51 L. Middle Occipital Gyrus | 5 | -15 | -106 | -1 | 2.94 | Left-VisualAssoc (18) |
| | | 39 L. Parahippocampal Gyrus | 5 | -12 | -25 | -11.5 | 2.86 | Left-Parahip (36) |
| | | 51 L. Middle Occipital Gyrus | 5 | -30 | -97 | 2 | 2.75 | Left-VisualAssoc (18) |
| c5 | negative auditory ESA | 68 R. Precuneus | 2421 | 21 | -55 | 23 | -5.06 | Right-BA23 |
| | | 8 R. Middle Frontal Gyrus | 657 | 33 | 38 | 44 | -4.77 | Right-BA9 |
| | | 7 L. Middle Frontal Gyrus | 125 | -21 | 2 | 50 | -4.37 | Left-BA6 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c5 | negative auditory ESA | 5 L. Superior Frontal Gyrus - Orbital Part | 113 | -21 | 68 | -4 | -3.95 | Left-BA10 |
| | | 7 L. Middle Frontal Gyrus | 114 | -39 | 32 | 29 | -3.81 | Left-BA9 |
| | | 56 R. Fusiform Gyrus | 81 | 36 | -37 | -16 | -3.61 | Right-Fusiform (37) |
| | | 32 R. Anterior Cingulate Cortex | 30 | 6 | 41 | -1 | -3.60 | Right-BA32 |
| | | 4 R. Superior Frontal Gyrus | 99 | 30 | 62 | 5 | -3.51 | Right-BA10 |
| | | 72 R. Caudate | 15 | 9 | 20 | -4 | -3.48 | Right-Caudate (48) |
| | | 51 L. Middle Occipital Gyrus | 41 | -36 | -82 | 29 | -3.28 | Left-BA19 |
| | | 52 R. Middle Occipital Gyrus | 6 | 36 | -70 | 2 | -3.09 | Right-BA19 |
| | | 73 L. Putamen | 11 | -18 | 20 | 2 | -3.04 | Left-Caudate (48) |
| c6 | positive visual ESA | 54 R. Inferior Occipital Gyrus | 551 | 27 | -91 | -4 | 5.31 | Right-VisualAssoc (18) |
| | | 40 R. Parahippocampal Gyrus | 112 | 21 | -10 | -25 | 5.21 | Right-Parahip (36) |
| | | 51 L. Middle Occipital Gyrus | 911 | -36 | -88 | 2 | 4.54 | Left-VisualAssoc (18) |
| | | 56 R. Fusiform Gyrus | 134 | 39 | -31 | -19 | 4.23 | Right-Parahip (36) |
| | | 27 L. Gyrus Rectus | 47 | 0 | 35 | -25 | 3.68 | Right-BA11 |
| | | 82 R. Superior Temporal Gyrus | 8 | 45 | -37 | 5 | 3.56 | Right-BA21 |
| | | 1 L. Precentral Gyrus | 9 | -45 | 5 | 32 | 3.14 | Left-BA6 |
| c6 | negative visual ESA | 68 R. Precuneus | 936 | 12 | -67 | 32 | -5.53 | Right-BA7 |
| | | 63 L. SupraMarginal Gyrus | 200 | -57 | -25 | 23 | -4.30 | Left-BA40 |
| | | 48 R. Lingual Gyrus | 93 | 12 | -79 | -1 | -4.17 | Right-VisualAssoc (18) |
| | | 85 L. Middle Temporal Gyrus | 27 | -63 | -61 | -4 | -4.12 | Left-Fusiform (37) |
| | | 4 R. Superior Frontal Gyrus | 58 | 27 | 65 | 11 | -3.93 | Right-BA10 |
| | | 64 R. SupraMarginal Gyrus | 22 | 69 | -31 | 38 | -3.59 | Right-BA40 |
| | | 72 R. Caudate | 6 | 9 | 11 | 17 | -3.47 | Right-Caudate (48) |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 8 | -18 | 20 | -16 | -3.45 | Left-BA11 |
| | | 62 R. Inferior Parietal Lobule | 69 | 60 | -52 | 41 | -3.43 | Right-BA39 |
| | | 8 R. Middle Frontal Gyrus | 15 | 39 | 29 | 41 | -3.37 | Right-BA9 |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 18 | -27 | 59 | -4 | -3.36 | Left-BA10 |
| | | 7 L. Middle Frontal Gyrus | 6 | -36 | 38 | 41 | -3.34 | Left-BA9 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c6 | negative visual ESA | 10 R. Middle Frontal Gyrus - Orbital Part | 7 | 33 | 50 | -1 | -3.21 | Right-BA10 |
| | | 71 L. Caudate | 6 | -9 | 8 | 20 | -3.13 | Left-Caudate (48) |
| | | 47 L. Lingual Gyrus | 7 | -6 | -76 | -4 | -3.13 | Left-VisualAssoc (18) |
| | | **Sustained (blocks)** | | | | | | |
| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
| c7 | Auditory > rest (activation) | 82 R. Superior Temporal Gyrus | 22827 | 54 | 2 | -13 | 9.71 | Right-BA22 |
| | | 68 R. Precuneus | 10 | 27 | -46 | 17 | 2.78 | Right-BA23 |
| | | 2 R. Precentral Gyrus | 8 | 42 | -22 | 68 | 2.48 | Right-BA6 |
| | | 57 L. Postcentral Gyrus | 11 | -63 | -13 | 32 | 2.30 | Left-PrimMotor (4) |
| | | 27 L. Gyrus Rectus | 5 | -3 | 14 | -25 | 2.27 | Left-BA25 |
| c7 | Auditory < rest (deactivation) | 46 R. Cuneus | 3270 | 18 | -100 | 8 | 5.39 | Right-VisualAssoc (18) |
| | | 40 R. Parahippocampal Gyrus | 55 | 36 | -37 | -10 | 3.59 | Right-Parahip (36) |
| | | 26 R. Medial Surface of the Frontal Lobe - Orbital Part | 42 | 9 | 71 | -7 | 3.22 | Right-BA10 |
| | | 39 L. Parahippocampal Gyrus | 28 | -33 | -43 | -4 | 2.75 | Left-Parahip (36) |
| | | 4 R. Superior Frontal Gyrus | 25 | 18 | 71 | 8 | 2.70 | Right-BA10 |
| | | 53 L. Inferior Occipital Gyrus | 11 | -48 | -82 | -4 | 2.70 | Left-BA19 |
| | | 39 L. Parahippocampal Gyrus | 5 | -9 | 2 | -34 | 2.31 | Left-Parahip (36) |
| c9 | Visual > rest (activation) | 43 L. Calcarine Sulcus | 12653 | -6 | -88 | -1 | 14.81 | Left-PrimVisual (17) |
| | | 15 L. Inferior Frontal Gyrus - Orbital Part | 1160 | -48 | 44 | -13 | 7.25 | Left-BA47 |
| | | 8 R. Middle Frontal Gyrus | 437 | 51 | 32 | 35 | 6.95 | Right-BA9 |
| | | 27 L. Gyrus Rectus | 258 | -3 | 53 | -16 | 5.64 | Left-BA11 |
| | | 31 L. Anterior Cingulate Cortex | 32 | -3 | 5 | 26 | 4.71 | Left-BA24 |
| | | 58 R. Postcentral Gyrus | 11 | 66 | -1 | 23 | 4.16 | Right-PrimMotor (4) |
| | | 14 R. Inferior Frontal Gyrus - pars triangulars | 14 | 54 | 26 | 5 | 3.69 | Right-BA45 |
| | | 86 R. Middle Temporal Gyrus | 9 | 48 | -40 | 8 | 3.62 | Right-BA22 |
| | | 57 L. Postcentral Gyrus | 11 | -63 | -7 | 26 | 3.53 | Left-PrimMotor (4) |
| c9 | Visual < rest (deactivation) | 63 L. SupraMarginal Gyrus | 3613 | -63 | -25 | 26 | 6.01 | Left-BA40 |
| | | 78 R. Thalamus | 94 | 3 | -25 | -1 | 4.33 | Right-Thalamus (50) |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c9 | Visual < rest (deactivation) | 30 R. Insula | 53 | 39 | 11 | 5 | 4.21 | Right-BA44 |
| | | 85 L. Middle Temporal Gyrus | 22 | -63 | -61 | -1 | 4.18 | Left-Fusiform (37) |
| | | 8 R. Middle Frontal Gyrus | 427 | 24 | 32 | 38 | 4.12 | Right-BA8 |
| | | 77 L. Thalamus | 125 | -12 | -16 | 20 | 3.82 | Left-Thalamus (50) |
| | | 66 R. Angular Gyrus | 11 | 48 | -76 | 37 | 3.79 | Right-BA39 |
| | | 68 R. Precuneus | 38 | 27 | -46 | 17 | 3.67 | Right-BA23 |
| | | 34 R. Middle Cingulate Cortex | 96 | 3 | 11 | 35 | 3.65 | Right-BA32 |
| | | 3 L. Superior Frontal Gyrus | 123 | -21 | 29 | 32 | 3.53 | Left-BA8 |
| | | 67 L. Precuneus | 40 | -24 | -49 | 17 | 3.50 | Left-BA23 |
| | | 20 R. Supplementary Motor Area | 75 | 15 | -1 | 65 | 3.39 | Right-BA6 |
| | | 31 L. Anterior Cingulate Cortex | 32 | -12 | 38 | -1 | 3.14 | Left-BA32 |
| | | 71 L. Caudate | 24 | -15 | 20 | 8 | 3.12 | Left-Caudate (48) |
| | | 22 R. Olfactory Sulcus | 13 | 9 | 8 | -16 | 3.05 | Right-BA25 |
| | | 68 R. Precuneus | 29 | 18 | -52 | 35 | 3.00 | Right-BA31 |
| | | 21 L. Olfactory Sulcus | 10 | -9 | 5 | -16 | 2.92 | Left-NucAccumb (52) |
| | | 89 L. Inferior Temporal Gyrus | 5 | -48 | -31 | -28 | 2.80 | Left-BA20 |
| | | 58 R. Postcentral Gyrus | 29 | 30 | -28 | 41 | 2.80 | Right-PrimSensory (1) |
| | | 88 R. Middle Temporal Pole | 10 | 42 | 11 | -31 | 2.59 | Right-BA38 |
| | | 31 L. Anterior Cingulate Cortex | 26 | 0 | 29 | 23 | 2.42 | Right-BA32 |
| | | Transient (events) | | | | | | |
| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
| c8 | Auditory > rest (activation) | 81 L. Superior Temporal Gyrus | 572 | -42 | -28 | 8 | 7.89 | Left-PrimAuditory (41) |
| | | 80 R. Heschls Gyrus | 423 | 48 | -22 | 8 | 7.12 | Right-PrimAuditory (41) |
| | | 46 R. Cuneus | 1560 | 15 | -103 | 8 | 6.45 | Right-VisualAssoc (18) |
| c8 | Auditory < rest (deactivation) | 22 R. Olfactory Sulcus | 16830 | 21 | 8 | -13 | 7.10 | Right-Putamen (49) |
| | | 1 L. Precentral Gyrus | 20 | -30 | -13 | 44 | 2.83 | Left-BA6 |
| | | 33 L. Middle Cingulate Cortex | 20 | 0 | -22 | 41 | 2.74 | Right-BA31 |
| | | 28 R. Gyrus Rectus | 5 | 9 | 26 | -28 | 2.68 | Right-BA11 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI (x,y,z) | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c8 | Auditory < rest (deactivation) | 57 L. Postcentral Gyrus | 13 | -24 | -31 | 71 | 2.63 | Left-PrimSensory (1) |
| | | 2 R. Precentral Gyrus | 11 | 21 | -28 | 71 | 2.48 | Right-PrimMotor (4) |
| c10 | Visual > rest (activation) | 56 R. Fusiform Gyrus | 1061 | 30 | -55 | -13 | 8.79 | Right-Fusiform (37) |
| | | 55 L. Fusiform Gyrus | 962 | -27 | -52 | -7 | 7.59 | Left-BA19 |
| | | 78 R. Thalamus | 161 | 6 | -25 | -4 | 4.50 | Right-Thalamus (50) |
| | | 2 R. Precentral Gyrus | 120 | 45 | 2 | 32 | 4.43 | Right-BA6 |
| | | 62 R. Inferior Parietal Lobule | 56 | 27 | -49 | 50 | 3.92 | Right-BA7 |
| | | 1 L. Precentral Gyrus | 61 | -39 | 2 | 32 | 3.85 | Left-BA6 |
| | | 21 L. Olfactory Sulcus | 11 | -9 | 5 | -16 | 3.42 | Left-NucAccumb (52) |
| | | 19 L. Supplementary Motor Area | 16 | -9 | 14 | 47 | 3.33 | Left-BA6 |
| | | 61 L. Inferior Parietal Lobule | 43 | -24 | -49 | 53 | 3.22 | Left-BA7 |
| | | 78 R. Thalamus | 20 | 9 | -10 | 17 | 3.17 | Right-Thalamus (50) |
| | | 34 R. Middle Cingulate Cortex | 13 | 12 | 20 | 35 | 3.08 | Right-BA8 |
| | | 34 R. Middle Cingulate Cortex | 20 | 15 | -37 | 44 | 3.06 | Right-SensoryAssoc (5) |
| | | 22 R. Olfactory Sulcus | 8 | 6 | 11 | -16 | 2.97 | Right-BA25 |
| | | 1 L. Precentral Gyrus | 10 | -39 | -4 | 47 | 2.93 | Left-BA6 |
| | | 33 L. Middle Cingulate Cortex | 15 | -18 | -34 | 41 | 2.81 | Left-BA31 |
| | | 82 R. Superior Temporal Gyrus | 7 | 69 | -40 | 20 | 2.79 | Right-BA22 |
| | | 78 R. Thalamus | 8 | 12 | -13 | 2 | 2.65 | Right-Thalamus (50) |
| | | 84 R. Superior Temporal Pole | 11 | 57 | 8 | -10 | 2.64 | Right-BA38 |
| | | 77 L. Thalamus | 5 | -9 | -10 | 17 | 2.64 | Left-Thalamus (50) |
| | | 10 R. Middle Frontal Gyrus - Orbital Part | 6 | 30 | 38 | -16 | 2.48 | Right-BA47 |
| c10 | Visual < rest (deactivation) | 67 L. Precuneus | 7280 | -30 | -49 | 5 | 7.15 | Left-BA30 |
| | | 3 L. Superior Frontal Gyrus | 4753 | -12 | 56 | 32 | 6.38 | Left-BA9 |
| | | 66 R. Angular Gyrus | 332 | 48 | -58 | 29 | 4.75 | Right-BA39 |
| | | 86 R. Middle Temporal Gyrus | 27 | 57 | 5 | -31 | 3.60 | Right-BA38 |
| | | 30 R. Insula | 18 | 39 | 5 | -16 | 3.15 | Right-Insula (13) |
| | | 5 L. Superior Frontal Gyrus - Orbital Part | 6 | -15 | 68 | -10 | 2.92 | Left-BA10 |

| Contrast | | Automatic Anatomical Labeling | Cluster Size | MNI $_{(x,y,z)}$ | | | t-value | BA |
|---|---|---|---|---|---|---|---|---|
| c10 | Visual < rest (deactivation) | 90 R. Inferior Temporal Gyrus | 29 | 60 | -16 | -28 | 2.83 | Right-BA21 |

Contrasts represent: c1: block-based contrast between auditory versus visual stimuli blocks, c2: event-related contrast between environmental versus vocal sounds, c3: event-related contrast between face versus scene images, c4: ESA for all (visual and auditory) hits versus all misses, c5: ESA for auditory hits versus auditory misses, c6: ESA for visual hits versus visual misses, c7: auditory versus rest blocks, c9: visual versus rest blocks, c8: auditory events versus rest and c10: visual events versus rest. All brain regions are described with MNI coordinates (MNI(x,y,z)), t-values of the beta coefficients and the relating Brodmann-Area (BA). Contrast maps are uploaded under https://neurovault.org/collections/IABCOPVN/.

## 5 Model comparison between mixed, block- and event-only modeling

Our task was designed as a mixed model and therefore we analyzed it accordingly (one model including regressors for both blocks and events). Nevertheless, one can discuss whether results differ between different models and if yes in which direction and how much. To explore differences between models/designs we modeled our data additionally using a block design (block-only) and using an event design (event-only).

The block-only model contained two regressors: one for the auditory blocks and one for the visual blocks, identical to those in the mixed-design (Manuscript Figure 2). This allowed for estimation of the two block-related (sustained) contrasts: the auditory blocks versus rest (c7) and the visual blocks versus rest (c9) without the influence of the event-regressors. The event-only model contained eight regressors: one for each of the stimulus conditions (environmental, vocal, face and scene) by subsequent memory (hits and misses), identical to those in the mixed-design (Manuscript Figure 2). This allowed for estimation of the event-related (transient) contrasts without the influence of the block-regressors.

We extracted the fMRI activity, using a 5mm radius sphere, from four regions of interest (ROI) defined by the global maxima (positive ESA) and minima (negative ESA) of sensory-unspecific ESA (c4), and the maxima of auditory ESA (c5) and the maxima of visual ESA (c6) to compare sustained and transient activity and to compare the mixed, isolated block and isolated event models (Figure A.3, Table A.3).

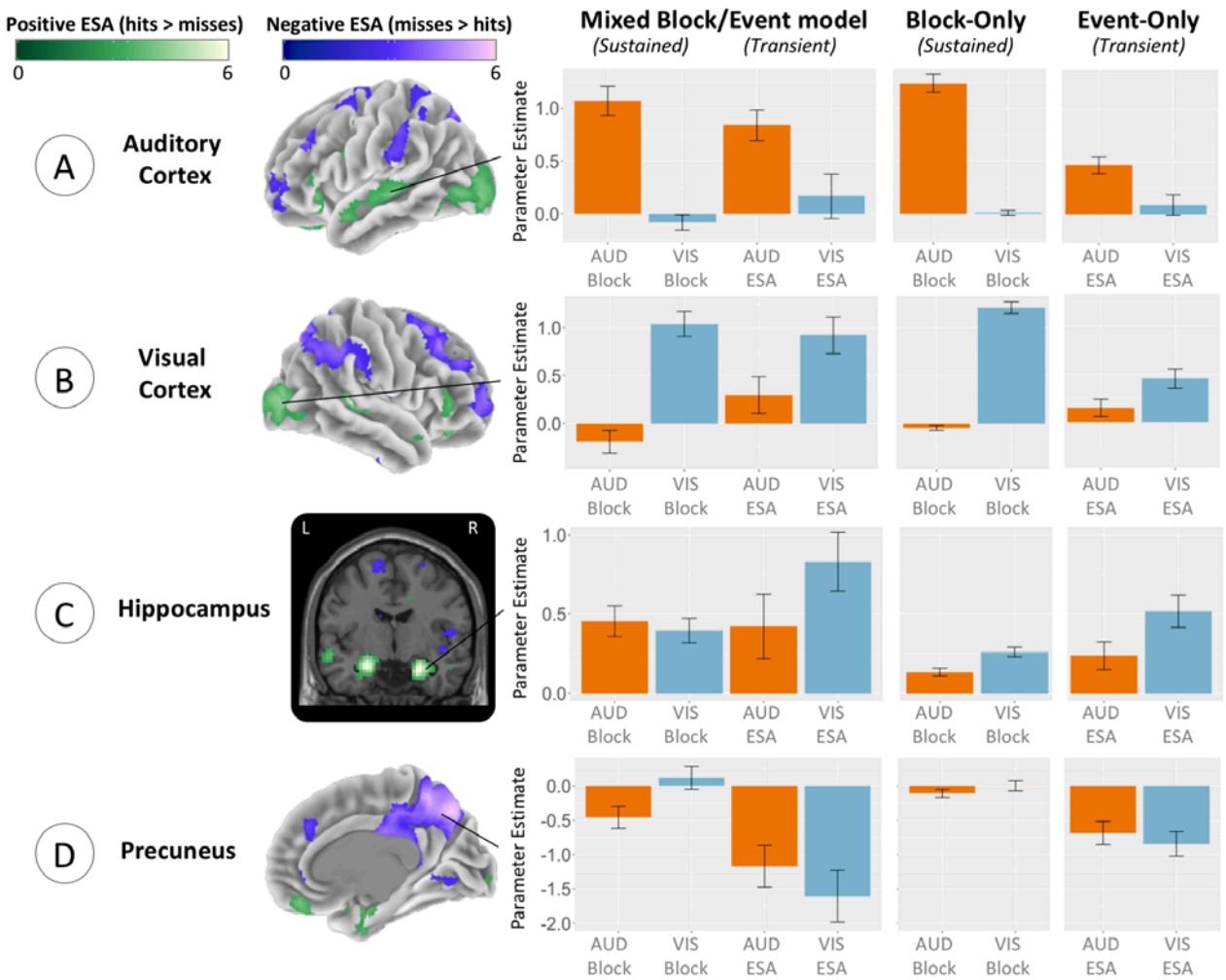


**Figure A.3.** Sustained (block) activity in contrast to rest activity, calculated with the mixed block/event design and the block-only design for auditory (AUD) and visual (VIS) stimuli separately for four regions of interest (ROIs). Transient (event) activity is shown as the difference between hit > miss (encoding success activity (ESA)) activity, calculated from the mixed block/event design and the event-only design for auditory and visual stimuli separately for four ROIs (A to D). ROIs were chosen using the ESA contrast (Manuscript Figure 5).

## Table A.3 Model comparison of sustained and transient activity

| **(A) Auditory cortex:** $MNI_{(x,y,z)}$ = [-60,-13,-4] | | | | | | | |
|---|---|---|---|---|---|---|---|
| Contrast | | *M* | *SD* | *t*-value | *M* | *SD* | *t*-value |
| | | Mixed Model | | | Block-only Model | | |
| c7 | Auditory blocks > rest | 1.07 | 1.08 | 7.66 | 1.24 | 0.68 | 14.15 |
| c9 | Visual blocks > rest | -0.08 | 0.57 | -1.14 | 0.01 | 0.18 | 0.33 |
| c1 | Auditory blocks > Visual blocks | 1.15 | 1.34 | 6.66 | 1.23 | 0.70 | 13.52 |
| | | Mixed Model | | | Event-only Model | | |
| c5 | Auditory ESA (hits > misses) | 0.84 | 1.14 | 5.69 | 0.46 | 0.60 | 5.97 |
| c6 | Visual ESA (hits > misses) | 0.16 | 1.64 | 0.76 | 0.09 | 0.74 | 0.89 |
| **(B) Visual cortex:** $MNI_{(x,y,z)}$ = [27,-91,-4] | | | | | | | |
| Contrast | | *M* | *SD* | *t-value* | *M* | *SD* | *t*-value |
| | | Mixed Model | | | Block-only Model | | |
| c7 | Auditory blocks > rest | -0.20 | 0.92 | -1.64 | -0.05 | 0.20 | -1.88 |
| c9 | Visual blocks > rest | 1.04 | 1.01 | 7.94 | 1.21 | 0.47 | 19.85 |
| c1 | Auditory blocks > Visual blocks | -1.23 | 1.37 | -6.99 | -1.26 | 0.55 | -17.60 |
| | | Mixed Model | | | Event-only Model | | |
| c5 | Auditory ESA (hits > misses) | 0.29 | 1.49 | 1.53 | 0.15 | 0.71 | 1.58 |
| c6 | Visual ESA (hits > misses) | 0.92 | 1.49 | 4.70 | 0.45 | 0.79 | 4.32 |
| **(C) Hippocampus:** $MNI_{(x,y,z)}$ = [21,-7,-25] | | | | | | | |
| Contrast | | *M* | *SD* | *t*-value | *M* | *SD* | *t*-value |
| | | Mixed Model | | | Block-only Model | | |
| c7 | Auditory blocks > rest | 0.45 | 0.75 | 4.68 | 0.13 | 0.20 | 5.01 |
| c9 | Visual blocks > rest | 0.40 | 0.60 | 5.13 | 0.26 | 0.23 | 8.58 |
| c1 | Auditory blocks > Visual blocks | 0.06 | 0.96 | 0.47 | -0.13 | 0.34 | -2.95 |
| | | Mixed Model | | | Event-only Model | | |
| c5 | Auditory ESA (hits > misses) | 0.42 | 1.58 | 2.07 | 0.24 | 0.68 | 2.72 |
| c6 | Visual ESA (hits > misses) | 0.83 | 1.43 | 4.42 | 0.52 | 0.79 | 4.98 |
| **(D) Precuneus:** $MNI_{(x,y,z)}$ = [9,-70,44] | | | | | | | |
| Contrast | | *M* | *SD* | *t*-value | *M* | *SD* | *t*-value |
| | | Mixed Model | | | Block-only Model | | |
| c7 | Auditory blocks > rest | -0.46 | 1.23 | -2.87 | -0.11 | 0.44 | -1.91 |
| c9 | Visual blocks > rest | 0.12 | 1.28 | 0.71 | 0.00 | 0.56 | 0.02 |
| c1 | Auditory blocks > Visual blocks | -0.57 | 1.94 | -2.30 | -0.11 | 0.66 | -1.28 |
| | | Mixed Model | | | Event-only Model | | |
| c5 | Auditory ESA (hits > misses) | -1.17 | 2.37 | -3.83 | -0.69 | 1.31 | -4.07 |
| c6 | Visual ESA (hits > misses) | -1.61 | 2.93 | -4.19 | -0.84 | 1.38 | -4.65 |

Mean (*M*), standard deviation (*SD*) and *t*-values of beta coefficients from block and event-based encoding success activity (ESA) contrasts extracted from the mixed, the block-only and the event-only model for the four regions of interest.

For both the auditory and the visual cortex (A and B in Figure A.3, Table A.3) we found increased sustained activity for corresponding blocks (auditory and visual) coincided with the transient auditory ESA, using the mixed design, but not for the respective other sensory condition. In the hippocampus (C in Figure A.3, Table A.3), we found sustained activity for both auditory and visual blocks and this coincided with transient ESA for both sensory conditions, using the mixed design. In the precuneus (D in Figure A.3, Table A.3), we found slight sustained deactivations for the auditory block, but not for the visual block and this coincided with transient negative ESA for both sensory conditions, using the mixed design. For all four ROI's we found a consistent pattern of activity in the block-only and event-only model. Together, these analyses indicate that the mixed model identifies activity patterns relatively similar to more sparse models that include only block or event regressors. We also found slight differences in both the auditory and the visual cortex where activity seemed to be an additive combination of transient and sustained increases. For example, the auditory cortex showed both sustained and transient increases in auditory activity and the mixed model separates both contributions. In the hippocampus and precuneus the pattern is non-additive, which suggests that the sustained and transient response diverge. The hippocampus showed greater increases in activity in the mixed-model and the precuneus shows greater decreases. The hippocampus showed further sustained increases that coincide with relative transient decreases. Similarly, the precuneus showed sustained decreases that coincide with transient increases in activity.

## 6 Analysis of reliability

For our reliability analysis we split the task into two sessions (Blocks 1 to 16 and Blocks 17 to 32). Both sessions contained two blocks of each stimulus category presented isolated and one block for each possible parallel combination (vocal-face; vocal-scene; environmental-face; environmental-scene) presented parallel (Figure 1.).

### 6.1 Behavioral reliability analysis

For a first glance on the differences in performance of participants between the sessions we compared Hit-rate and FA-rate (Figure A.4). Overall and in both sensory conditions Hit-rates between the sessions differ between 13% and 17%, with the second session showing lower Hit-rates. This is very likely due to the task length, which seems to lead over time to a lower memory performance for participants. Nevertheless, our aim to create Hit-rates around 50% was met in both sessions. FA-rates did not differ between the two sessions, which shows equally well performance in rejecting new stimuli. The combination of Hit- and FA-rate (d-prime) confirms that memory performance was not equally well between the two sessions, but with values between 0.89 and 2.08 (Table A.4) we measured memory performance in both sessions and not random answering.

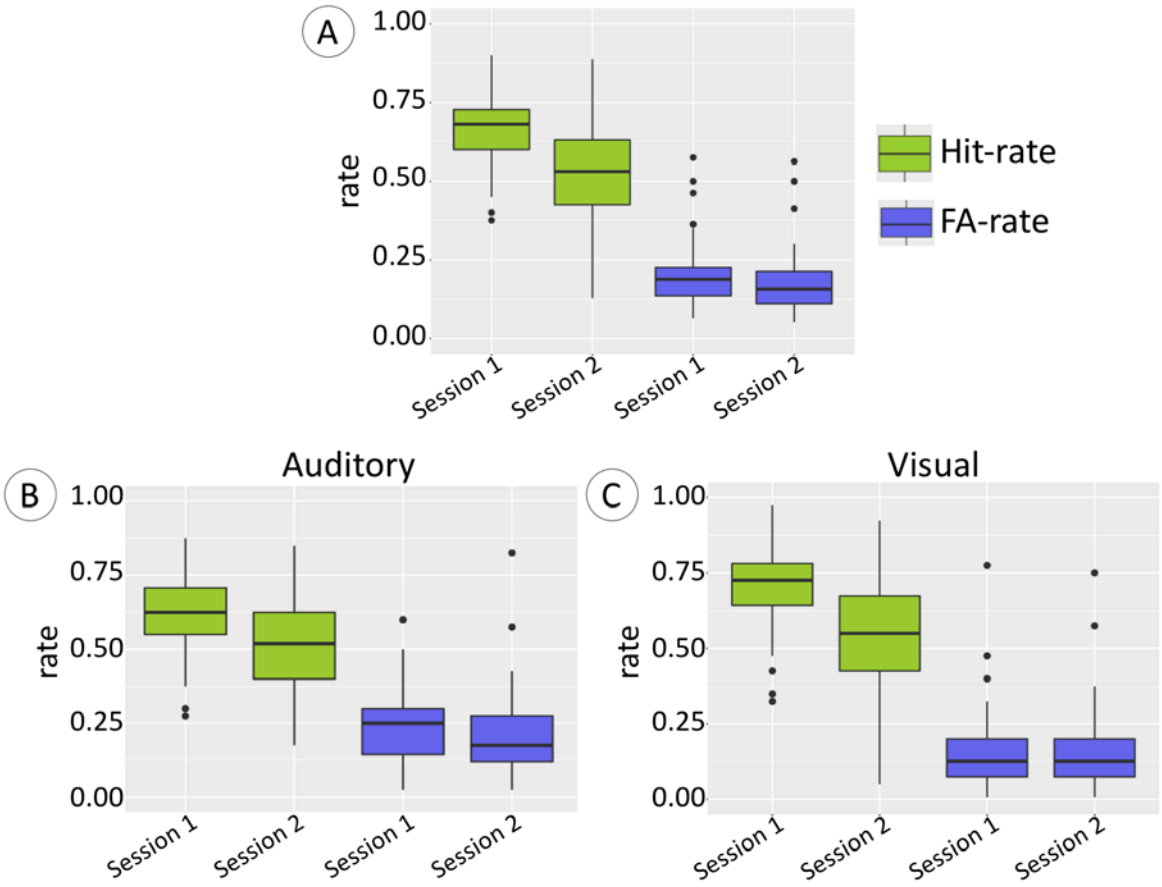


**Figure A.4.** Difference of Hit- and FA-rate between the two task sessions. (A) Hit-and FA-rate over all stimuli conditions. (B) Hit- and FA-rate for all auditory stimuli. (C) Hit- and FA-rate for all visual stimuli.

Table A.4 shows the behavioral ICC values, their confidence intervals and the *F*-statistics.

**Table A.4 Intraclass correlation coefficients for behavioral analysis**

| | | | | | 95% CI | | F-Test with true value 0; df1 = 59, df2 = 59 | |
|---|---|---|---|---|---|---|---|---|
| | | Session 1 Mean (SD) | Session 2 Mean (SD) | Intraclass Correlation | LB | UB | Value | *p* |
| **Hit-rate** | | 0.67 (0.11) | 0.52 (0.14) | .655 | .483 | .779 | 4.81 | .000 |
| | Auditory | 0.63 (0.14) | 0.50 (0.16) | .704 | .549 | .812 | 5.75 | .000 |
| | Environmental | 0.60 (0.17) | 0.44 (0.16) | .557 | .355 | .710 | 3.52 | .000 |
| | Vocal | 0.66 (0.16) | 0.57 (0.19) | .618 | .434 | .753 | 4.24 | .000 |
| | Visual | 0.71 (0.13) | 0.54 (0.19) | .551 | .347 | .705 | 3.45 | .000 |
| | Face | 0.69 (0.16) | 0.49 (0.23) | .400 | .165 | .593 | 2.34 | .001 |
| | Scene | 0.73 (0.16) | 0.60 (0.19) | .511 | .297 | .676 | 3.09 | .000 |
| **FA-rate** | | 0.20 (0.10) | 0.18 (0.11) | .812 | .705 | .884 | 9.66 | .000 |
| | Auditory | 0.24 (0.13) | 0.21 (0.14) | .766 | .637 | .853 | 7.54 | .000 |
| | Environmental | 0.20 (0.11) | 0.18 (0.14) | .587 | .393 | .731 | 3.84 | .000 |
| | Vocal | 0.29 (0.17) | 0.24 (0.16) | .738 | .597 | .835 | 6.64 | .000 |
| | Visual | 0.15 (0.12) | 0.15 (0.13) | .739 | .599 | .836 | 6.68 | .000 |
| | Face | 0.20 (0.15) | 0.19 (0.16) | .723 | .576 | .825 | 6.22 | .000 |
| | Scene | 0.11 (0.11) | 0.11 (0.13) | .549 | .345 | .704 | 3.44 | .000 |
| ***d'*** | | 1.36 (0.41) | 1.05 (0.47) | .675 | .510 | .792 | 5.16 | .000 |
| | Auditory | 1.11 (0.54) | 0.90 (0.52) | .622 | .439 | .756 | 4.29 | .000 |
| | Environmental | 1.20 (0.61) | 0.89 (0.66) | .461 | .237 | .639 | 2.71 | .000 |
| | Vocal | 1.10 (0.66) | 1.00 (0.56) | .435 | .205 | .619 | 2.54 | .000 |
| | Visual | 1.73 (0.63) | 1.31 (0.68) | .649 | .475 | .775 | 4.70 | .000 |
| | Face | 1.51 (0.71) | 0.99 (0.77) | .499 | .282 | .667 | 2.99 | .000 |
| | Scene | 2.08 (0.76) | 1.73 (0.87) | .557 | .354 | .709 | 3.51 | .000 |

Intraclass correlation coefficients (ICC) separately for Hit-, FA-rate and d-prime (*d'*) tested against the null hypothesis. A two-way model using single units of each participant was applied to assess the consistency between the outcomes of the two sessions.
*Note*: CI indicates the confidence interval with LB (lower bound) and UB (upper bound).

## 6.2 Reliability of sensory-specific and encoding success activity

Voxel-wise ICC analysis for the fMRI data is based on the slice time corrected and normalized, but non-smoothed data. Figure A.5 shows the smoothed results from the ICC analysis in comparison to the results for the task-based activity analyses for the four main contrasts auditory vs. visual (c1), environmental vs. vocal (c2), face vs. scene (c3) and hits vs. misses (encoding success activity, c4). Table A.5 shows the smoothed ICC values for the ROIs defined above (see "Model comparison between mixed, block- and event-only modeling"). Table A.6 shows median, minimum and maximum ICC values for each cluster defined in the previous section ("Cluster peaks for all contrasts").

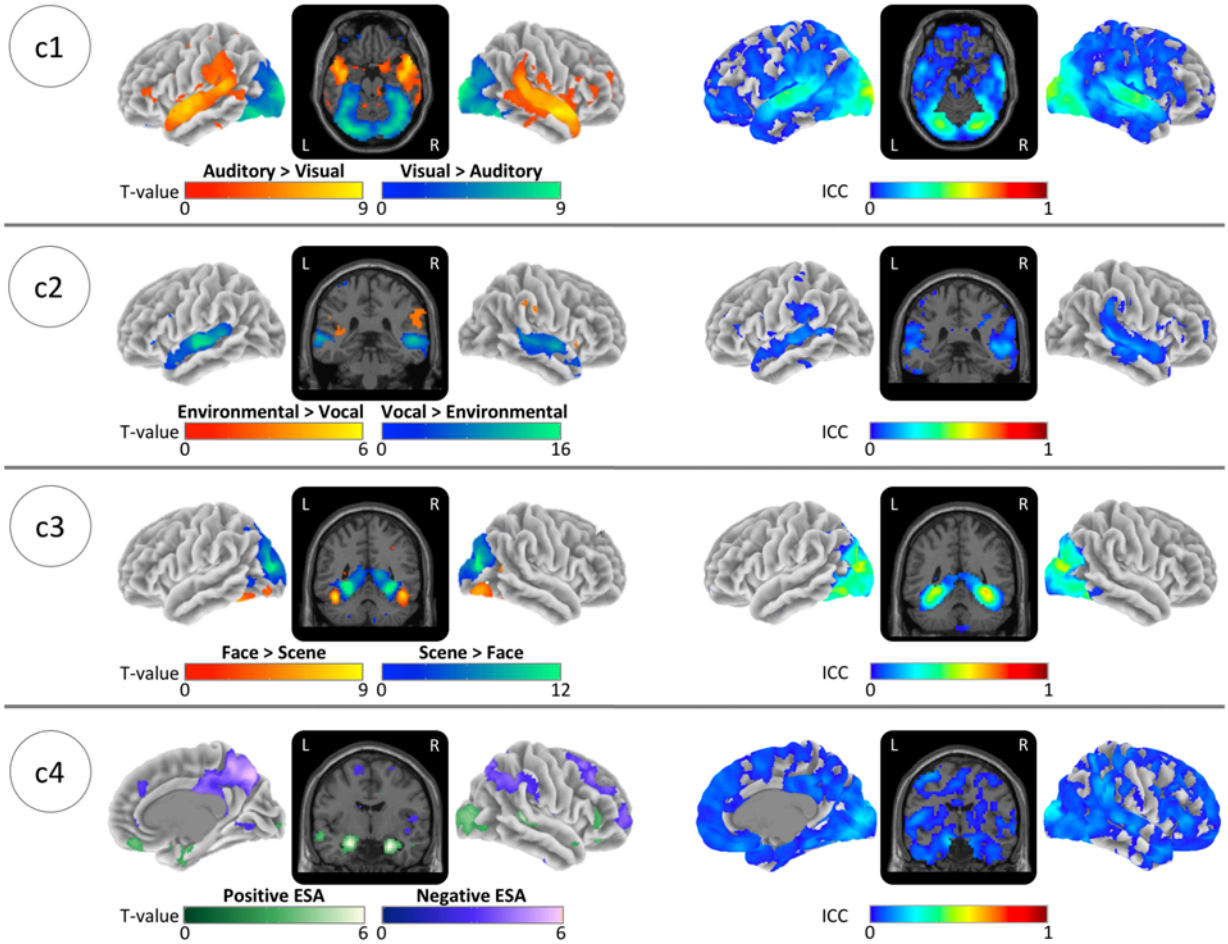


**Figure A.5.** ICC results in comparison to the task-based activity for the contrasts c1 (visual vs. auditory), c2 (environmental vs. vocal), c3 (face vs. scene) and c4 (encoding success activity (ESA), hits vs. misses). The left column shows brain activity at a threshold of $p < 0.05$ (FDR-corrected). The right column shows ICCs between 0 and 1. Grey areas represent ICC values under 0, which are considered as poor agreement similarly to 0 (2). Contrast c2 was masked by auditory greater visual activity ($p < 0.05$ FDR, see c1 left column), and contrast c3 was masked by visual greater auditory activity ($p < 0.05$ FDR, see c1 left column). Intraclass correlation coefficient maps as well as contrast maps are uploaded under https://neurovault.org/collections/IABCOPVN/.

## Table A.5 Intraclass correlation coefficients for ROIs

| | | **Sensory–Specific Activity** | | | | | |
|---|---|---|---|---|---|---|---|
| Contrast | | Region | $MNI_{(x,y,z)}$ | | | Intraclass Correlation | BA |
| c1 | Auditory > Visual | Auditory cortex | 54, | - 1, | -13 | .227 | 22/41 |
| | Visual > Auditory | Visual cortex | -3, | -91, | -4 | .380 | 17/18 |
| c2 | Environmental > Vocal | Temporoparietal junction | 57, | -28, | 32 | .026 | 39/40 |
| | Vocal > Environmental | Superior temporal gyrus | 63, | -1, | -10 | .044 | 22 |
| c3 | Face > Scene | Fusiform gyrus | -42, | -49, | -22 | .388 | 37 |
| | Scene > Face | Parahippocampal gyrus | -27, | -49, | -7 | .514 | 19/36 |
| | | **Encoding success activity (ESA)** | | | | | |
| Contrast | | Region | $MNI_{(x,y,z)}$ | | | Intraclass Correlation | BA |
| c4 | Positive ESA | Hippocampus | 21, | -7, | -25 | .067 | 36/54 |
| | Negative ESA | Precuneus | 9, | -70, | 44 | .024 | 7 |

Intraclass correlation coefficients for the main activated Regions (ROIs) of the contrasts Auditory vs. Visual stimuli (c1), Environmental vs. Vocal stimuli (c2), Face vs. Scene stimuli (c3) and Hit vs. Miss stimuli (c4). All brain regions are described with MNI coordinates ($MNI_{(x,y,z)}$) and the relating Brodmann-Area (BA). Intraclass correlation coefficient maps as well as contrast maps are uploaded under https://neurovault.org/collections/IABCOPVN/.

## Table A.6 Median intraclass correlation coefficients for clusters

| Contrast | | Sensory-specific contrasts Intraclass correlation coefficient Median | Min | Max | Cluster size | Cluster activation peaks MNI (x,y,z) | | | Automatic Anatomical Labeling | BA |
|---|---|---|---|---|---|---|---|---|---|---|
| c1 | Auditory > Visual | 0.060 | 0.000 | 0.449 | 9242 | 54 | -1 | -13 | 82 R. Superior Temporal Gyrus | Right-BA22 |
| | | 0.007 | 0.000 | 0.093 | 393 | -9 | 35 | 5 | 31 L. Anterior Cingulate Cortex | Left-BA24 |
| | | 0.000 | 0.000 | 0.067 | 46 | -51 | -34 | -25 | 89 L. Inferior Temporal Gyrus | Left-BA20 |
| | | 0.017 | 0.000 | 0.095 | 38 | 27 | 20 | 35 | 8 R. Middle Frontal Gyrus | Right-BA8 |
| | | 0.052 | 0.000 | 0.104 | 27 | -27 | 17 | 38 | 7 L. Middle Frontal Gyrus | Left-BA8 |
| | | 0.008 | 0.000 | 0.056 | 8 | 36 | -43 | 71 | 58 R. Postcentral Gyrus | Right-PrimSensory (1) |
| | | 0.004 | 0.000 | 0.016 | 10 | 6 | 17 | 29 | 32 R. Anterior Cingulate Cortex | Right-BA32 |
| | | 0.072 | 0.058 | 0.104 | 10 | -39 | 11 | 23 | 11 L. Inferior Frontal Operculum | Left-BA44 |
| c1 | Visual > Auditory | 0.203 | 0.000 | 0.664 | 10987 | -3 | -91 | -4 | 43 L. Calcarine Sulcus | Left-VisualAssoc (18) |
| | | 0.005 | 0.000 | 0.061 | 59 | -9 | 68 | -7 | 5 L. Superior Frontal Gyrus - Orbital Part | Left-BA10 |
| | | 0.000 | 0.000 | 0.017 | 36 | -3 | 5 | 26 | 31 L. Anterior Cingulate Cortex | Left-BA24 |
| | | 0.030 | 0.000 | 0.072 | 39 | -9 | 62 | 35 | 3 L. Superior Frontal Gyrus | Left-BA9 |
| | | 0.026 | 0.000 | 0.041 | 19 | 21 | 68 | 11 | 4 R. Superior Frontal Gyrus | Right-BA10 |
| | | 0.077 | 0.039 | 0.126 | 12 | -36 | 56 | -16 | 9 L. Middle Frontal Gyrus - Orbital Part | Left-BA10 |
| | | 0.000 | 0.000 | 0.001 | 6 | 27 | -4 | -43 | 56 R. Fusiform Gyrus | Right-BA20 |
| | | 0.004 | 0.000 | 0.020 | 8 | -12 | 38 | -25 | 5 L. Superior Frontal Gyrus - Orbital Part | Left-BA11 |
| | | 0.000 | 0.000 | 0.009 | 6 | 42 | -13 | -31 | 56 R. Fusiform Gyrus | Right-BA20 |
| | | 0.072 | 0.047 | 0.104 | 5 | -18 | 50 | -19 | 5 L. Superior Frontal Gyrus - Orbital Part | Left-BA11 |
| c2 | Environmental > Vocal | 0.035 | 0.000 | 0.118 | 158 | 57 | -28 | 32 | 64 R. SupraMarginal Gyrus | Right-BA40 |
| | | 0.000 | 0.000 | 0.016 | 93 | -6 | 35 | 8 | 31 L. Anterior Cingulate Cortex | Left-BA24 |
| | | 0.000 | 0.000 | 0.083 | 119 | 39 | 14 | -7 | 30 R. Insula | Right-Insula (13) |
| | | 0.014 | 0.000 | 0.074 | 27 | -36 | 17 | 8 | 29 L. Insula | Left-BA45 |
| | | 0.000 | 0.000 | 0.000 | 32 | -42 | -16 | -10 | 81 L. Superior Temporal Gyrus | Left-BA22 |
| | | 0.000 | 0.000 | 0.004 | 46 | 9 | 23 | 26 | 32 R. Anterior Cingulate Cortex | Right-BA32 |
| | | 0.000 | 0.000 | 0.069 | 42 | -45 | -37 | 29 | 63 L. SupraMarginal Gyrus | Left-BA40 |
| | | 0.000 | 0.000 | 0.032 | 12 | 18 | -31 | 41 | 34 R. Middle Cingulate Cortex | Right-SensoryAssoc (5) |
| | | 0.000 | 0.000 | 0.000 | 6 | 42 | -22 | 2 | 82 R. Superior Temporal Gyrus | Right-PrimAuditory (41) |
| c2 | Vocal > Environmental | 0.022 | 0.000 | 0.206 | 8321 | 63 | -1 | -10 | 82 R. Superior Temporal Gyrus | Right-BA22 |
| | | 0.000 | 0.000 | 0.067 | 474 | -54 | -1 | 47 | 1 L. Precentral Gyrus | Left-BA6 |
| | | 0.000 | 0.000 | 0.143 | 367 | 58 | 0 | 42 | 2 R. Precentral Gyrus | Right-BA6 |
| | | 0.000 | 0.000 | 0.000 | 184 | 3 | 47 | -16 | 28 R. Gyrus Rectus | Right-BA11 |
| | | 0.000 | 0.000 | 0.058 | 42 | -18 | -31 | -1 | 37 L. Hippocampus | Left-Thalamus (50) |
| | | 0.020 | 0.000 | 0.077 | 52 | 15 | -10 | 77 | 4 R. Superior Frontal Gyrus | Right-BA6 |
| | | 0.000 | 0.000 | 0.065 | 74 | -24 | -61 | 62 | 59 L. Superior Parietal Lobule | Left-BA7 |

| Contrast | | Intraclass correlation coefficient | | | Cluster size | Cluster activation peaks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Median | Min | Max | | MNI (x,y,z) | | | Automatic Anatomical Labeling | BA |
| c2 | Vocal > Environmental | 0.000 | 0.000 | 0.021 | 65 | -6 | 59 | 32 | 23 L. Superior Frontal Gyrus - Medial Part | Left-BA9 |
| | | 0.019 | 0.000 | 0.063 | 30 | -33 | -31 | 71 | 57 L. Postcentral Gyrus | Left-PrimSensory (1) |
| | | 0.000 | 0.000 | 0.008 | 43 | 45 | -19 | 65 | 2 R. Precentral Gyrus | Right-BA6 |
| | | 0.015 | 0.000 | 0.054 | 12 | 15 | -79 | 56 | 60 R. Superior Parietal Lobule | Right-BA7 |
| | | 0.000 | 0.000 | 0.036 | 69 | 24 | -64 | 68 | 60 R. Superior Parietal Lobule | Right-BA7 |
| | | 0.000 | 0.000 | 0.028 | 30 | -12 | 5 | 74 | 19 L. Supplementary Motor Area | Left-BA6 |
| | | 0.000 | 0.000 | 0.000 | 21 | 15 | -1 | 29 | 72 R. Caudate | Right-BA24 |
| | | 0.000 | 0.000 | 0.029 | 57 | -6 | -40 | 74 | 67 L. Precuneus | Left-SensoryAssoc (5) |
| | | 0.000 | 0.000 | 0.000 | 5 | 27 | -58 | 11 | 44 R. Calcarine Sulcus | Right-BA23 |
| | | 0.000 | 0.000 | 0.012 | 7 | 15 | -52 | 23 | 68 R. Precuneus | Right-BA23 |
| | | 0.000 | 0.000 | 0.000 | 6 | 27 | 35 | 53 | 4 R. Superior Frontal Gyrus | Right-BA8 |
| | | 0.000 | 0.000 | 0.000 | 10 | 21 | -37 | 77 | 58 R. Postcentral Gyrus | Right-SensoryAssoc (5) |
| | | 0.000 | 0.000 | 0.045 | 7 | 54 | 32 | -10 | 16 R. Inferior Frontal Gyrus - Orbital Part | Right-BA47 |
| | | 0.000 | 0.000 | 0.006 | 7 | -3 | 14 | 62 | 19 L. Supplementary Motor Area | Left-BA6 |
| c3 | Face > Scene | 0.013 | 0.000 | 0.548 | 7350 | -42 | -49 | -22 | 55 L. Fusiform Gyrus | Left-Fusiform (37) |
| | | 0.011 | 0.000 | 0.078 | 235 | 6 | 50 | -19 | 28 R. Gyrus Rectus | Right-BA11 |
| | | 0.000 | 0.000 | 0.095 | 186 | -30 | -4 | 32 | 1 L. Precentral Gyrus | Left-BA6 |
| | | 0.000 | 0.000 | 0.108 | 100 | 54 | 5 | 47 | 2 R. Precentral Gyrus | Right-BA6 |
| | | 0.003 | 0.000 | 0.160 | 514 | 18 | 8 | 2 | 76 R. Pallidum | Right-Putamen (49) |
| | | 0.000 | 0.000 | 0.042 | 87 | -36 | 20 | 56 | 7 L. Middle Frontal Gyrus | Left-BA8 |
| | | 0.000 | 0.000 | 0.031 | 91 | -6 | 62 | 32 | 23 L. Superior Frontal Gyrus - Medial Part | Left-BA10 |
| | | 0.008 | 0.000 | 0.031 | 36 | 15 | -34 | 20 | 36 R. Posterior Cingulate Cortex | Right-Caudate (48) |
| | | 0.022 | 0.000 | 0.064 | 61 | -33 | -10 | -43 | 89 L. Inferior Temporal Gyrus | Left-BA20 |
| | | 0.000 | 0.000 | 0.006 | 79 | -39 | 41 | 35 | 7 L. Middle Frontal Gyrus | Left-BA9 |
| | | 0.013 | 0.005 | 0.036 | 9 | -39 | 17 | -43 | 87 L. Middle Temporal Pole | Left-BA38 |
| | | 0.032 | 0.000 | 0.073 | 31 | -60 | 11 | 23 | 11 L. Inferior Frontal Operculum | Left-BA44 |
| | | 0.000 | 0.000 | 0.000 | 6 | 45 | -70 | 50 | 66 R. Angular Gyrus | Right-BA39 |
| | | 0.000 | 0.000 | 0.000 | 6 | -6 | 23 | 65 | 19 L. Supplementary Motor Area | Left-BA6 |
| | | 0.009 | 0.000 | 0.042 | 11 | 27 | 2 | 32 | 12 R. Inferior Frontal Operculum | Right-BA8 |
| | | 0.046 | 0.007 | 0.068 | 8 | 3 | -34 | 5 | 48 R. Lingual Gyrus | Right-Thalamus (50) |
| | | 0.000 | 0.000 | 0.000 | 5 | -54 | -4 | 50 | 1 L. Precentral Gyrus | Left-BA6 |
| | | 0.000 | 0.000 | 0.019 | 8 | -66 | -19 | 35 | 57 L. Postcentral Gyrus | Left-PrimSensory (1) |
| | | 0.000 | 0.000 | 0.009 | 5 | -48 | 20 | 35 | 11 L. Inferior Frontal Operculum | Left-BA8 |
| c3 | Scene > Face | 0.133 | 0.000 | 0.608 | 11769 | -27 | -49 | -7 | 55 L. Fusiform Gyrus | Left-BA19 |
| | | 0.006 | 0.000 | 0.029 | 15 | -15 | -7 | -1 | 77 L. Thalamus | Left-GlobPal (51) |
| | | 0.089 | 0.000 | 0.149 | 14 | -21 | 5 | 53 | 7 L. Middle Frontal Gyrus | Left-BA6 |
| | | 0.000 | 0.000 | 0.000 | 14 | 21 | -7 | -1 | 76 R. Pallidum | Right-GlobPal (51) |

| Contrast | Intraclass correlation coefficient | | | Cluster size | Cluster activation peaks | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Median | Min | Max | | MNI (x,y,z) | | | Automatic Anatomical Labeling | BA |
| c3 Scene > Face | 0.034 | 0.018 | 0.042 | 8 | -6 | 5 | -25 | 39 L. Parahippocampal Gyrus | Left-Amygdala (53) |
| | 0.048 | 0.024 | 0.058 | 5 | 12 | 59 | -4 | 26 R. Medial Surface of the Frontal Lobe - Orbital Part | Right-BA10 |
| | 0.001 | 0.000 | 0.017 | 8 | -9 | 23 | -16 | 27 L. Gyrus Rectus | Left-BA11 |
| | 0.108 | 0.000 | 0.234 | 14 | 54 | -55 | -10 | 90 R. Inferior Temporal Gyrus | Right-Fusiform (37) |
| | 0.000 | 0.000 | 0.012 | 10 | -33 | 38 | -13 | 9 L. Middle Frontal Gyrus - Orbital Part | Left-BA47 |
| | 0.039 | 0.005 | 0.106 | 17 | -6 | 17 | -4 | 71 L. Caudate | Left-Caudate (48) |
| | 0.000 | 0.000 | 0.000 | 11 | -42 | -19 | 23 | 17 L. Rolandic Operculum | Left-PrimSensory (1) |
| | 0.000 | 0.000 | 0.045 | 15 | -42 | -28 | 56 | 57 L. Postcentral Gyrus | Left-PrimSensory (1) |
| | **Encoding Success Activity (ESA) contrasts for isolated blocks** | | | | | | | | |
| Contrast | Intraclass correlation coefficient | | | Cluster size | Cluster activation peaks | | | | |
| | Median | Min | Max | | MNI (x,y,z) | | | Automatic Anatomical Labeling | BA |
| c4 positive ESA | 0.043 | 0.000 | 0.155 | 279 | 21 | -7 | -25 | 40 R. Parahippocampal Gyrus | Right-Parahip (36) |
| | 0.052 | 0.000 | 0.197 | 336 | -24 | -10 | -19 | 37 L. Hippocampus | Left-Hippocampus (54) |
| | 0.055 | 0.000 | 0.169 | 182 | 45 | -37 | 5 | 82 R. Superior Temporal Gyrus | Right-BA21 |
| | 0.108 | 0.000 | 0.279 | 456 | 33 | -91 | 8 | 52 R. Middle Occipital Gyrus | Right-VisualAssoc (18) |
| | 0.041 | 0.000 | 0.150 | 169 | -39 | 32 | -10 | 15 L. Inferior Frontal Gyrus - Orbital Part | Left-BA47 |
| | 0.096 | 0.000 | 0.242 | 615 | -27 | -91 | -7 | 53 L. Inferior Occipital Gyrus | Left-VisualAssoc (18) |
| | 0.017 | 0.000 | 0.071 | 64 | 21 | 35 | -13 | 6 R. Superior Frontal Gyrus - Orbital Part | Right-BA11 |
| | 0.039 | 0.000 | 0.146 | 305 | -60 | -28 | -1 | 85 L. Middle Temporal Gyrus | Left-BA22 |
| | 0.066 | 0.000 | 0.151 | 221 | 6 | 44 | -19 | 28 R. Gyrus Rectus | Right-BA11 |
| | 0.013 | 0.000 | 0.094 | 102 | -42 | 14 | 23 | 11 L. Inferior Frontal Operculum | Left-BA44 |
| | 0.080 | 0.000 | 0.160 | 112 | 45 | 35 | 2 | 14 R. Inferior Frontal Gyrus - pars triangulars | Right-BA46 |
| | 0.016 | 0.000 | 0.049 | 11 | 60 | -1 | -10 | 82 R. Superior Temporal Gyrus | Right-BA22 |
| | 0.000 | 0.000 | 0.000 | 6 | -30 | -1 | -49 | 55 L. Fusiform Gyrus | Left-BA38 |
| | 0.064 | 0.035 | 0.113 | 13 | -54 | -1 | 50 | 1 L. Precentral Gyrus | Left-BA6 |
| | 0.000 | 0.000 | 0.000 | 11 | 57 | -1 | 50 | 2 R. Precentral Gyrus | Right-BA6 |
| c4 negative ESA | 0.050 | 0.000 | 0.198 | 2802 | 9 | -70 | 44 | 68 R. Precuneus | Right-BA7 |
| | 0.029 | 0.000 | 0.177 | 1274 | 27 | 65 | 8 | 4 R. Superior Frontal Gyrus | Right-BA10 |
| | 0.041 | 0.000 | 0.166 | 591 | -30 | 38 | 38 | 7 L. Middle Frontal Gyrus | Left-BA9 |
| | 0.024 | 0.000 | 0.201 | 757 | 54 | -49 | 41 | 62 R. Inferior Parietal Lobule | Right-BA39 |
| | 0.001 | 0.000 | 0.051 | 60 | 9 | 20 | -4 | 72 R. Caudate | Right-Caudate (48) |
| | 0.015 | 0.000 | 0.170 | 451 | -63 | -37 | 41 | 63 L. SupraMarginal Gyrus | Left-BA40 |
| | 0.000 | 0.000 | 0.062 | 183 | -21 | 8 | 53 | 7 L. Middle Frontal Gyrus | Left-BA6 |
| | 0.000 | 0.000 | 0.025 | 39 | 36 | 11 | 11 | 30 R. Insula | Right-BA44 |
| | 0.025 | 0.000 | 0.068 | 66 | -15 | 23 | -4 | 71 L. Caudate | Left-Caudate (48) |
| | 0.000 | 0.000 | 0.048 | 33 | 6 | 41 | -1 | 32 R. Anterior Cingulate Cortex | Right-BA32 |
| | 0.000 | 0.000 | 0.021 | 6 | -57 | -31 | -31 | 89 L. Inferior Temporal Gyrus | Left-BA20 |

| Contrast | | Intraclass correlation coefficient | | | Cluster size | Cluster activation peaks | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Median | Min | Max | | MNI (x,y,z) | | | Automatic Anatomical Labeling | BA |
| c4 | negative ESA | 0.053 | 0.000 | 0.103 | 149 | 6 | 38 | 32 | 34 R. Middle Cingulate Cortex | Right-BA8 |
| | | 0.000 | 0.000 | 0.015 | 8 | -36 | 8 | 11 | 29 L. Insula | Left-BA44 |
| | | 0.008 | 0.000 | 0.046 | 23 | 54 | -19 | -37 | 90 R. Inferior Temporal Gyrus | Right-BA20 |
| | | 0.051 | 0.028 | 0.108 | 11 | -63 | -61 | -4 | 85 L. Middle Temporal Gyrus | Left-Fusiform (37) |
| | | 0.031 | 0.000 | 0.092 | 25 | 51 | -10 | 8 | 80 R. Heschls Gyrus | Right-PrimAuditory (41) |
| | | 0.028 | 0.000 | 0.078 | 14 | 33 | 20 | -19 | 30 R. Insula | Right-BA47 |
| | | 0.045 | 0.020 | 0.073 | 9 | 15 | -82 | 26 | 46 R. Cuneus | Right-BA19 |
| | | 0.000 | 0.000 | 0.000 | 6 | 45 | -7 | -7 | 82 R. Superior Temporal Gyrus | Right-Insula (13) |
| | | 0.000 | 0.000 | 0.000 | 7 | -9 | -1 | 20 | 71 L. Caudate | Left-Caudate (48) |
| | | 0.000 | 0.000 | 0.000 | 6 | -21 | -28 | 77 | 57 L. Postcentral Gyrus | Left-PrimSensory (1) |
| | | 0.072 | 0.052 | 0.099 | 7 | -45 | 20 | 47 | 7 L. Middle Frontal Gyrus | Left-BA8 |
| | | 0.024 | 0.000 | 0.042 | 5 | -9 | 17 | 17 | 71 L. Caudate | Left-Caudate (48) |

Contrasts represent: c1: block-based contrast between auditory versus visual stimuli blocks, c2: event-related contrast between environmental versus vocal sounds, c3: event-related contrast between face versus scene images, c4: ESA for all (visual and auditory) hits versus all misses, c5: ESA for auditory hits versus auditory misses, c6: ESA for visual hits versus visual misses, c7: auditory versus rest blocks, c9: visual versus rest blocks, c8: auditory events versus rest and c10: visual events versus rest. For all found clusters, median, min and max of intraclass coefficients are shown and linked to the cluster activation peaks preseted in Table A.2. All cluster activation peaks are described with MNI coordinates (MNI(x,y,z)) and the relating Brodmann-Area (BA). Intraclass correlation coefficient maps as well as contrast maps are uploaded under https://neurovault.org/collections/IABCOPVN/.

## 7 References

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