**Neural coding of scene volume**

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**Introduction**

- Everyday computation of scene volume guides navigation and interactions with people and objects in space
- Spatial boundary representation of a scene in the PPA, RSC; Content representation in LOC, FFA (Park et al., in revision; VSS 2009; Epstein & Kanwisher, 1998)

**How is the spatial volume of a scene represented in the brain?**

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**Methods**

**Condition**

<table>
<thead>
<tr>
<th>Condition</th>
<th>large space</th>
<th>small space</th>
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<tbody>
<tr>
<td>1 person</td>
<td>2-4 people</td>
<td>8-12 people</td>
</tr>
<tr>
<td>30-50 people</td>
<td>few hundreds</td>
<td>thousands</td>
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</tbody>
</table>

- Blocked design (16 s/16 images per block)
- One back repetition task
- 3T Siemens scanner, TR=2s, 3x3x3 voxels
- No spatial smoothing; Talairach transformation for whole brain group analysis

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**Parametric representation of scene volume**

**ROI analysis:**

Parametric modulation by scene volume across different visual areas

![Parametric representation of scene volume](image)

- PPA
- RSC
- LOC
- FFA

**Whole brain group random effects analysis w/ parametric regressors**

**Pattern analysis**

Testing the representation of scene volume information beyond the semantic category

**Leave one category out classification:**

- 3-way SVM classification:
  - classification for small, medium, large volume
  - trained with 5 categories per scene volume & tested on a completely novel category
- Ridge regression:
  - using weighted sum of voxels to predict the spatial volume (6 volumes)
  - trained with 2 categories per scene volume & tested on a completely novel category

**Summary**

- Scene volume is parametrically represented in a range of areas in the visual pathway
- Spatial volume of a scene is represented independently of the semantic category of a scene