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Sensory-specific anomic aphasia following left occipital lesions - data from free oral descriptions of concrete word meanings

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**Background**

- Words activate brain regions associated with their referred objects and actions [1]
- Nouns with high semantic specificity (‘robin’) are likely to be more closely related to sensory information compared to those of low specificity (‘animal’) [2]
- Previous studies have found individuals with visual (occipital) lesions to have problems with accessing words from the visual modality (e.g. ‘optic aphasia’) [3]

![Figure 1: The occipital lobe [4]](https://example.com/figure1.png)

When visual areas of the brain are damaged, would the degree of visual semantic content and semantic specificity modulate performance in a lexical task?

**Method**

- Case study [5]
- Male Swedish speaker (ZZ) with left occipital lesions, diagnosed with anomic aphasia
- 4 controls with aphasia due to frontal/parietal lesions
- 5 healthy controls
- Free oral descriptions of word meanings (20 concrete (‘wolf’), 20 abstract, (‘variation’), 20 emotional (‘joy’)
- Analysis of content words in the produced material: level of specificity + sensory modality

**Results**

- ZZ produced fewer words of high lexical specificity (e.g. ‘carrot’), in contrast to controls
- Instead, a strikingly high proportion of ZZ’s words were at the most non-specific level (e.g. ‘plant’, ‘thing’)

![Figure 2: Distribution of words at different levels of semantic specificity](https://example.com/figure2.png)

- Controls predominately produced vision-related words, ZZ most often words related to sound

![Figure 3: Mean level of semantic specificity for each test word for individual subjects](https://example.com/figure3.png)

- ZZ’s descriptions of concrete words were unspecific compared to those of aphasic and healthy controls (e.g. ‘parrot’):

  ```
  it is an an if animal # that well # that I don’t know how to describe that animal # it squeaks a little sometimes # and says something # and says something # I don’t know so much about animals but it is an animal anyways # that often has a certain sound or euphony # by which it can express itself -ZZ
  ```

  ```
  it is a bird # and it talks perhaps # there are macaws # och cockatiels yes # and some other kinds it if what’s it called it # it’s on pirate ships or it just sits at home and and talks in the kitchen --aphasic control
  ```

![Figure 4: Distribution of sensory and motor features in the produced words](https://example.com/figure4.png)

**Discussion**

- Visual semantic features in left occipital lobe are crucial for vision-related words
- More specific levels in the semantic hierarchy seem to be associated with vision
- Semantic features of other sensory modalities, in particular audition, easier to access for ZZ
- ZZ’s emotional and abstract word descriptions similar to those of healthy controls (e.g. ‘abundance’):

  ```
  things that are unnecessary to have # and that which is # which is more than enough # it is that which it is more than enough of # you can translate with "more than enough" -ZZ
  ```

**Further research**

- Testing patients with lesions affecting other modalities (e.g. [6])
- More well-controlled stimuli set systematically including all sensory modalities
- Testing visual imagery

**References**

[1] Pulvermüller, F. & Fadiga, L. (2010). Active perception: sensorimotor circuits as a cortical basis for language. Nature Reviews Neuroscience 11, 351-360.
[2] Rosch, E. (1978). Principles of categorization. In: Rosch, Eleanor and Barbara B. Lloyd, eds., Cognition and Category. Hillsdale, NJ: Lawrence Erlbaum, pp. 27-48.
[3] Manning, L. (2000). Loss of visual imagery and defective recognition of parts of wholes in optic aphasia. NeuroCase 6 (2), 111-128.
[4] http://commons.wikimedia.org/wiki/File:3%CE%84Gray727.svg
[5] Mårtensson, F., Roll, M., Lindgren, M., Apt, P. & Horne, M. (2014). Sensory-specific anomic aphasia following left occipital lesions: Data from free oral descriptions of concrete word meanings. Neurocase 20, 192-207.
[6] Trump, N. M., Kiese, D., Hoenig, K., Haarmeier, T., & Kiefer, M. (2013). Losing the sound of concepts: Damage to auditory association cortex impairs the processing of sound-related concepts. Cortex.