



# LUND UNIVERSITY

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

Mårtensson, Frida; Roll, Mikael; Lindgren, Magnus; Apt, Pia; Horne, Merle

2014

[Link to publication](#)

### *Citation for published version (APA):*

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*. Abstract from 15th International Clinical Phonetics and Linguistics Association (ICPLA) Conference, Stockholm, Sweden. <http://www.icpla2014.se/>

### *Total number of authors:*

5

### **General rights**

Unless other specific re-use rights are stated the following general rights apply:

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117  
221 00 Lund  
+46 46-222 00 00





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

Frida Mårtensson<sup>1</sup>, Mikael Roll<sup>1</sup>, Magnus Lindgren<sup>2</sup>, Pia Apt<sup>3</sup> & Merle Horne<sup>1</sup>

<sup>1</sup>Dept. of Linguistics and Phonetics, Lund University; <sup>2</sup>Dept. of Psychology, Lund University; Skåne University Hospital, <sup>3</sup>Dept. Of Neurology, Malmö

## 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]

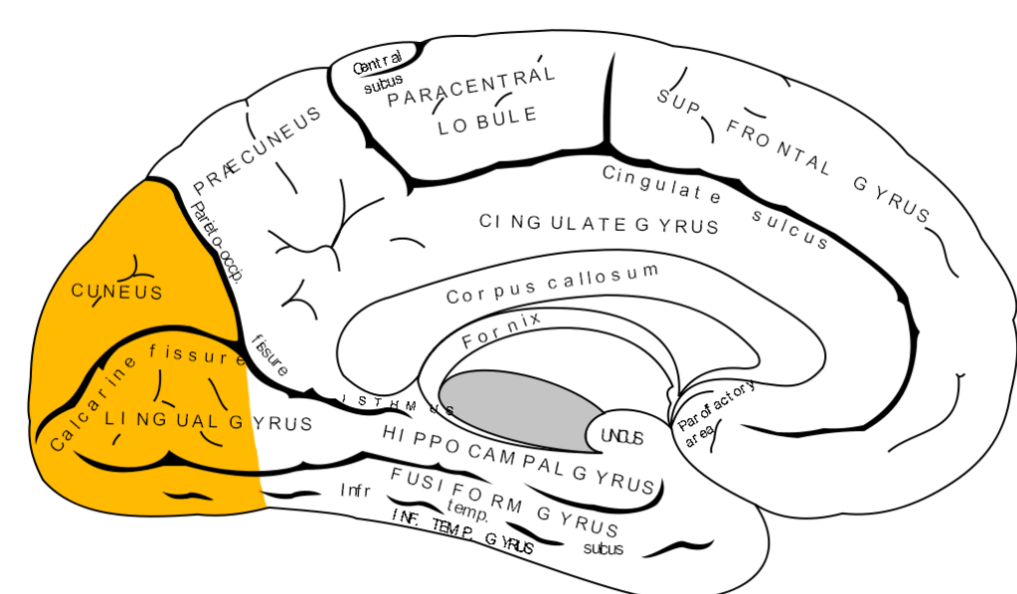


Figure 1: The occipital lobe [4]

- 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 anomomic aphasia
- 4 controls with aphasia due to frontal/temporoparietal 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

Test word	Response	Level
wolf	(is) grey/(has) fur/howls/(can) bite (looks like a) German shepherd (looks like a) dog (is a) predator (is an) animal	1 property/part-of-whole 2 subordinate level; perceptually detailed 3 basic level; perceptual Gestalt image possible to form 4 directly superordinate level; no or diffuse perceptual image 5 higher superordinate level; no or diffuse perceptual image

- Purely verbal task
- Testing performance in running speech, not only access to specific words (naming)

## 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')

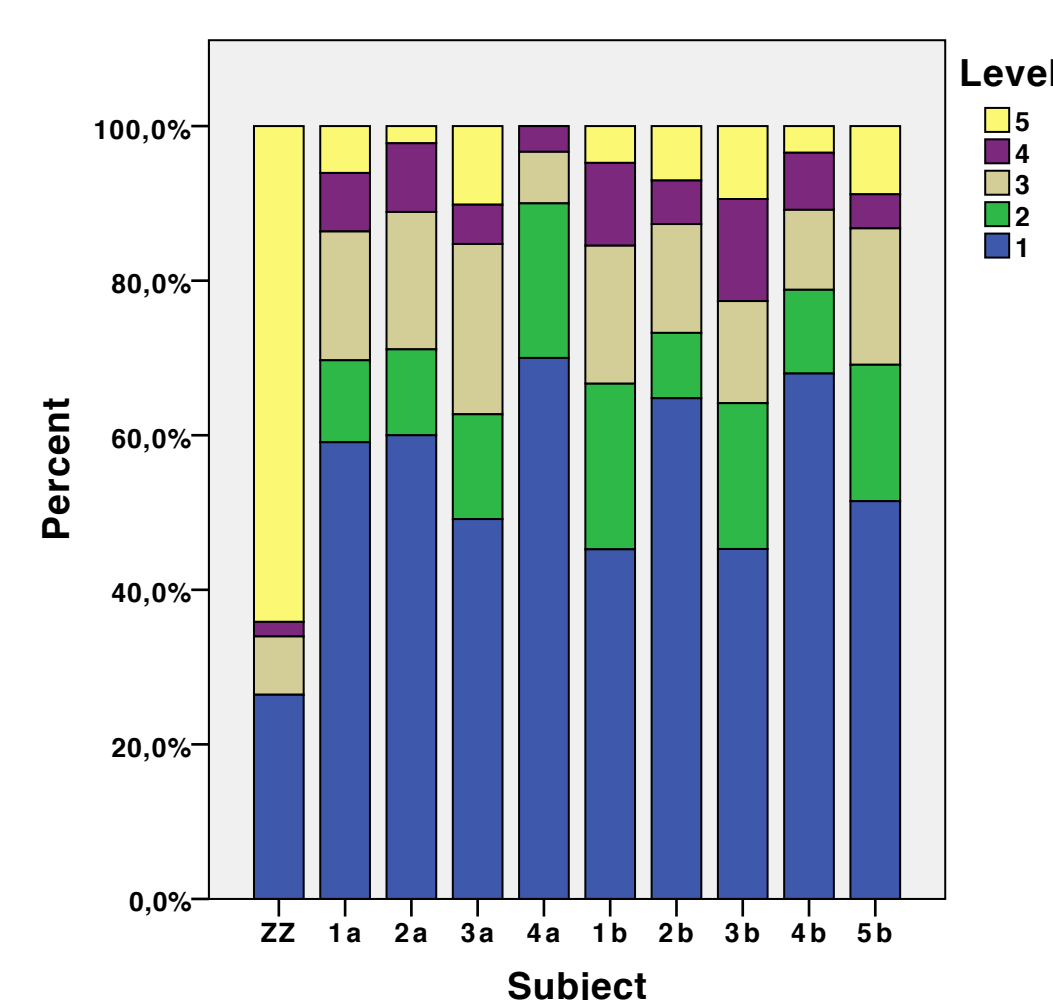


Figure 2: Distribution of words at different levels of semantic specificity

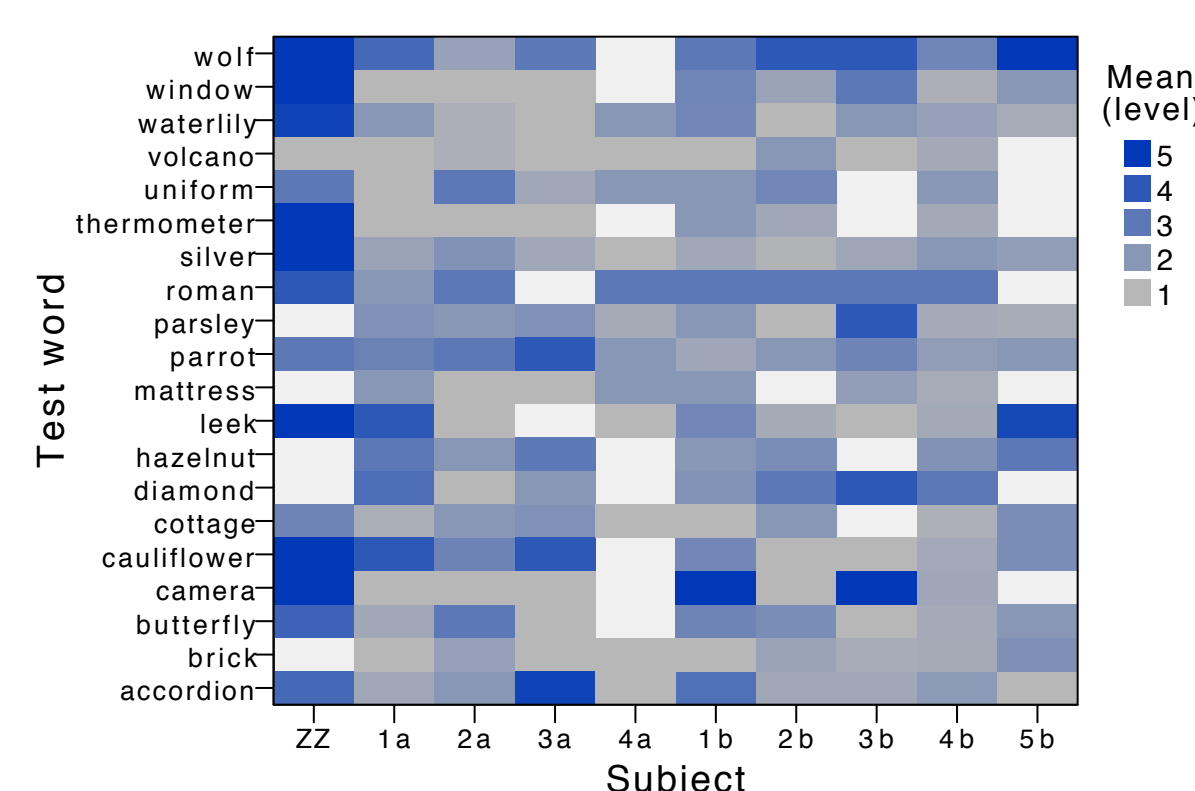


Figure 3: Mean level of semantic specificity for each test word for individual subjects

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

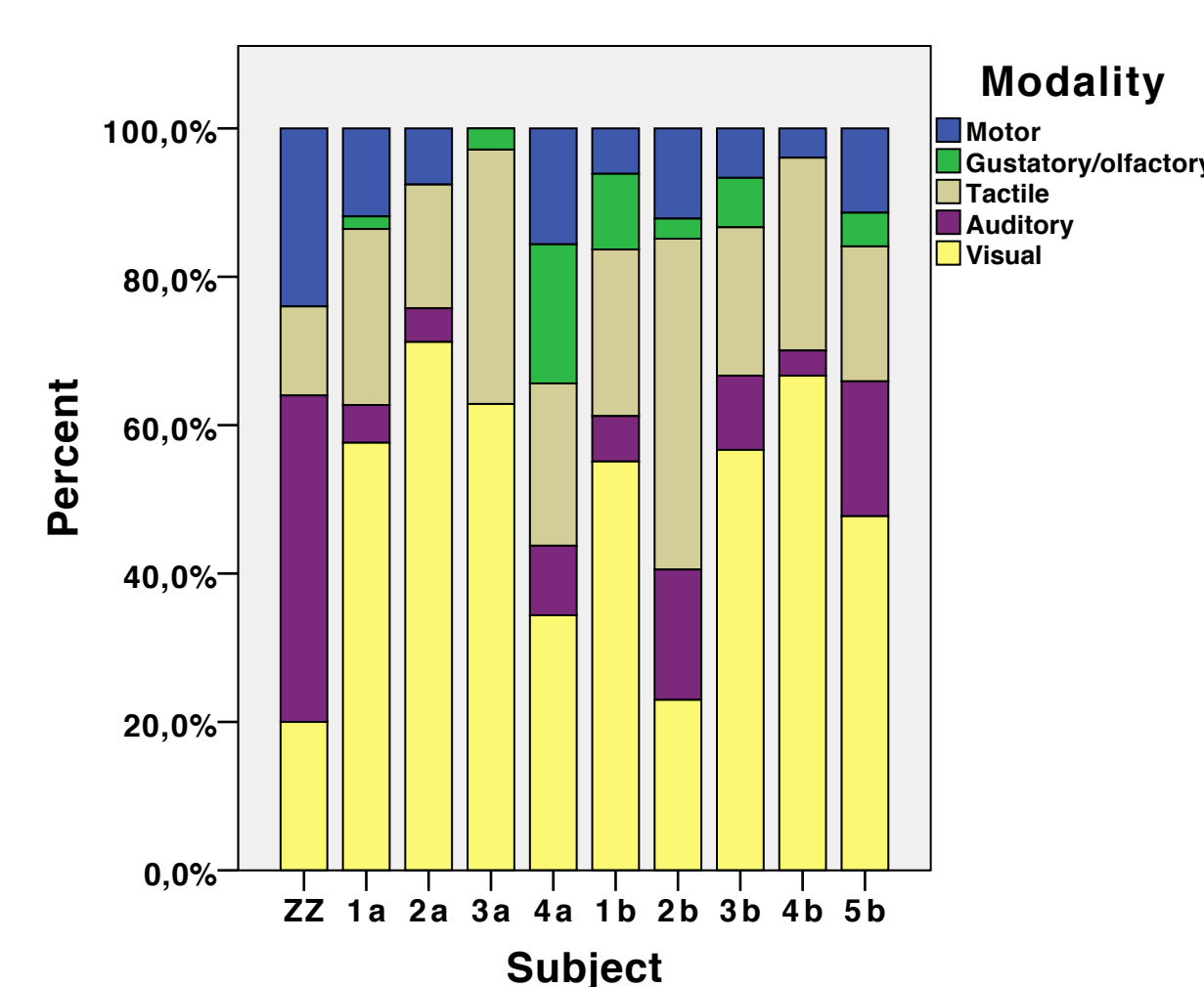


Figure 4: Distribution of sensory and motor features in the produced words

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

it is an an # an **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 # what's it called # it's on pirate ships or it just sits at home and and talks in the kitchen -aphasic control

## 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 # X is that which it is more than enough of # you can translate X 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 Categorization*. 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:%3AGray727.svg>
- [5] Mårtensson, F., Roll, M., Lindgren, M., Apt, P. & Horne, M. (2014). Sensory-specific anomomic aphasia following left occipital lesions: Data from free oral descriptions of concrete word meanings. *Neurocase* 20, 192-207.
- [6] Trumpp, N. M., Kliebe, 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*.