

Non-Literal Language Processing

Based on: Chapter 7 of the Traxler textbook

Non-literal Language

- ▶ *Can you open the door?*

Non-literal Language

- ▶ *Can you open the door?*
- ▶ *He is a real stud.*

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- ▶ *The stop light went from green to red.*

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- ▶ Speakers produce about six metaphors (4 “frozen” and 2 “novel” metaphors) per minute of speaking time
- ▶ About about one every 10 seconds (Pollio, Barlow, Fine, & Pollio, 1977)

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2. What are the neural events involved in non-literal language processing?

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2. How do listeners compute the non-literal meaning?

1. Standard Pragmatic view

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2. Comparison views: Property matching and graded salience hypotheses

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3. Class inclusion view

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1. Counter-examples related to the recognition problem

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2. Experimental counter-evidence

Recognition of Non-literal Meaning

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- ▶ Non-literal: *My wife behaves in an unpredictable and uncivilized way*
- ▶ Literal falsehood is not a necessary precondition for an utterance to be assigned a non-literal meaning.

- ▶ Paraphrasing

Experimental Counter-Evidence

- ▶ Paraphrasing
- ▶ Priming

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- ▶ Reading

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Are literal meanings computed faster than non-literal meanings?

Paraphrasing (Gibbs 1983)

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Participants asked to paraphrase:

- ▶ Direct, literal form: *I would like you to open the window*
- ▶ Indirect, non-literal form: *Can you open the window?*
- ▶ No difference in paraphrasing and paraphrase initiation time!

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- ▶ Non-literal meanings computed just as quickly as literal meanings

Reading (Ortony 1979)

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Subjects read literal and non-literal sentences with similar speeds!

Stroop Task (Stroop 1935)



Semantic Stroop Task (Glucksberg, 1998; 2003)

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- ▶ Literally false, but good non-literal interpretation
- ▶ People had a hard time rejecting literally and metaphorically “true” statements
- ▶ Compared to literally and metaphorically “false” statements like *Keith is a banana*

Standard Pragmatic View: Problems

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1. Non-literal meanings become available to the listener as quickly as literal meanings do
2. Computation of non-literal meanings is not optional
3. Undertaken even when the literal meaning is non-problematic in a given context

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1. **Comparison Approaches:** Property Matching and Graded Salience hypotheses
2. **Class Inclusion Approaches**

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- ▶ **Prediction:** Metaphoric expressions will take longer to interpret than similes

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- ▶ Under some circumstances, similes take longer to understand than equivalent metaphors (Glucksberg, 1998, 2003)
- ▶ Seems metaphors can be interpreted without mentally converting them to similes.

Property Matching Hypothesis (Ortony, 1979; Tversky, 1977)

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- ▶ *Nicole Kidman is bad medicine*

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- ▶ ?*Billboards are like pears*
- ▶ No common properties!

Salience Imbalance Hypothesis (Johnson & Malgady, 1979; Tourangeau & Sternberg, 1981)

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- ▶ Involve low-salience properties of the topic and high-salience properties of the vehicle

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- ▶ *No man is an island*

Class Inclusion Hypothesis

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Class Inclusion: Priming Study (Glucksberg, Manfredi, & McGlone, 1997)

Reading times measured for target sentence *My lawyer is a shark*, preceded by prime sentences:

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Reading times measured for target sentence *My lawyer is a shark*, preceded by prime sentences:

- ▶ Literal meaning of *shark*: *Sharks can swim*
- ▶ Participants had a harder time connecting topic (lawyer) and the superordinate category (dangerous animals)

Multiple Superordinate Categories (Glucksberg, Manfredi, & McGlone, 1997)

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- ▶ Vehicle makes a set of superordinate categories available for interpretation
- ▶ Characteristics of the topic point the reader toward the appropriate one

1. Right hemisphere hypothesis

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Inconclusive results

Right Hemisphere Hypothesis

Process of analyzing and interpreting language

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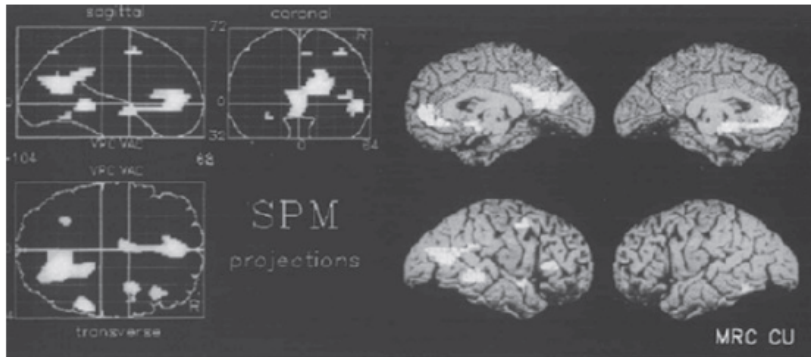
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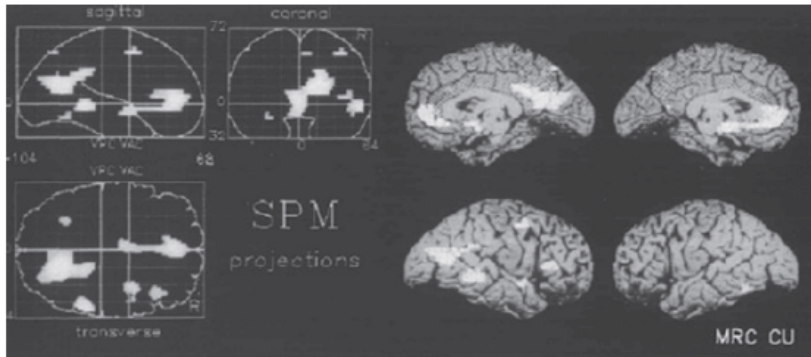
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PET Results (Bottini et al. 1994)



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Subsequent imaging studies have not supported the right hemisphere hypothesis, however

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- ▶ Right-hemisphere lexical representations well suited for distant semantic connections
- ▶ Left hemisphere contains more sharply defined lexical representations
- ▶ Thus activates a narrower range of associations in response to individual words
- ▶ More frequent meanings are more salient

Experimental Evidence

Graded Saliency Hypothesis receives some support from fMRI and TMS experiments

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- ▶ Literal (*paper napkin*) vs metaphoric (*paper tiger*) word pairs given to subjects
- ▶ Subject judgement: literal, novel metaphors, conventional (familiar) metaphors, or unrelated
- ▶ Novel metaphors produced greater response than conventional/familiar metaphors in the right hemisphere

fMRI Results (Mashal, Faust, Hendler, & Jung-Beeman 2007)

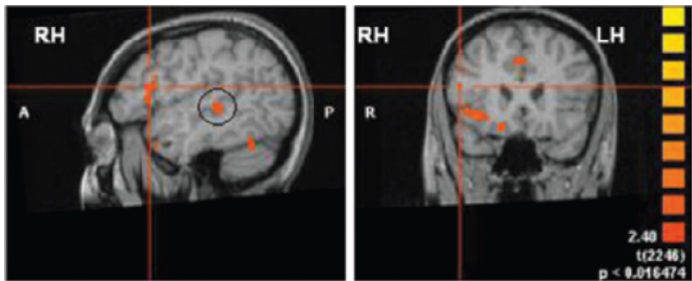


Figure: Orange areas represent parts of the brain that responded with greater activity to novel metaphors compared to conventional/familiar metaphors. The circled area is the right homologue of (counterpart to) Wernickes area.