

Probabilistic Interpretation of Figures of Speech

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- Metonymy and Metaphor

How could a Computer possibly find out that *enjoy a book* means *enjoy reading/writing a book* and not *enjoy smoking a book*?

Or how could it deduce that *to capture an idea* is *to understand/interpret an idea*?



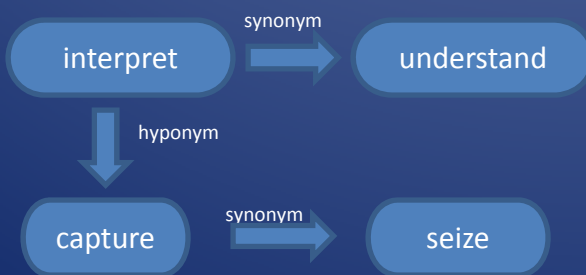
These are the questions my research is attempting to answer.

- Mechanisms of Creative Thought

Our knowledge about the world and the language is to a large extent encoded in combinatory preferences of the words in the text. Such preferences restrict our creative thought.

I model these probabilistically using the data from the British National Corpus to extract frequency information for selectional preferences and use WordNet to establish related meanings.

- WordNet Hierarchy



- Probabilistic Model

for Metonymy (Lapata and Lascarides 2003)

$$P(i, v, n) = P(i) \cdot P(v | i) \cdot P(n | i, v) = \frac{f(v, i) \cdot f(i, n)}{f(i) \cdot \sum_k f(i_k)}$$

where i stands for interpretation (e.g. *reading*), n for noun (*book*) and v for the metonymic verb (e.g. *enjoy*)

for Metaphor (direct object verb frame)

$$P(i, n) = P(i) \cdot P(n | i) = \frac{f(i)}{\sum_k f(i_k)} \cdot \frac{f(i, n)}{f(i)} = \frac{f(i, n)}{\sum_k f(i_k)}$$

where i stands for interpretation of the metaphoric verb, n for the noun in the metaphoric phrase

- Metonymy Interpretations

for *enjoy a book*

Log-Probability Interpretation

-16.15	read
-17.99	write
-19.46	work on
-19.96	browse
-19.97	look at
-20.22	get
-20.43	see
-20.55	throw

I cluster the verbs based on related meaning in order to filter these results.

- Metaphor Paraphrasing Results

for *capture an idea*

Log-Probability Interpretation

-10.41	get
-13.39	change
-13.59	represent
-14.15	interpret
-14.84	acquire
-15.53	modify
-15.53	catch
-16.23	seize

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