PSYC 3640
Psychological Studies of Language

How Words are Represented in Written Forms

October 16, 2007

Outline

- Language in the news again!
- Final exam: Dec 5
- Hand in Research Report
- Review for midterm (up to and including lecture 5)
- Chapters 9 and 11 in Altmann

Sound, Meaning, and Language

• Language is the tool to convey meaning – transforming mental states (meaning) to a commonly understood structure (spoken language → sound)

Charles Lutwidge Dodgson

• a.k.a. Lewis Carroll
• *Alice’s adventure in Wonderland, Jabberwocky*
• Literary nonsense
• Portmanteau: a word that combines two words, or morphemes, to give double meaning. E.g., DISDAQs → Discarded and Deleted Acquisitions
• Conventions (grammar) without meaning
• No meaning will be interpreted even if grammar is preserved.

http://staff.harrisonburg.k12.va.us/~cwalton/walton/SOLPics/cuneiform1.jpg

http://en.wikipedia.org/wiki/Lewis_Carroll
Dictionary and Thesaurus

- Is the meaning of language described in the dictionary and thesaurus?
- Old dictionaries only report literal meanings, but newer ones also report usage and give examples.
- Almost impossible to acquire meaning of new words from those already in the lexicon especially in the early developmental stage

Meaning as Sounds?

- Complicated matter…
- Sentence means more than each individual word
  \( \rightarrow \) gestalt psychology: the whole > the sum of its parts
- Meaning of each word \( \rightarrow \) mental lexicon
- Grammar \( \rightarrow \) word order, inflection…etc.
- Prosody
- Usage \( \rightarrow \) culture
- Gesture

Irony and Sarcasm

- Meaning get reversed!
- Are they the same?
- “Sarcasm is a remark seasoned with irony.”
- Sarcasm has a entertaining purpose while irony could either be casual or serious.
- Sarcasm is the vehicle to reach both humour and irony.

Types of Meaning

- Meaning of individual words
- Meaning of combinations of words
**Meaning of Individual Word**

- Knowledge that one has of the situations or contexts in which it would be appropriate to use that word
- In the brain: event occurs when "some particular neural circuitry somewhere in the brain is stimulated into activation"

**Neural Network of Meaning**

- Or should I say concept associated with each word?
- My understanding of a "linguist" could be different from yours!

**Does it matter?**

- Unique neural network for each person
- Some more extensive, some more confined
- As long as the neural networks of 'linguist' are activated in the same context, they will elicit some common understanding between the two individuals.
- Important: sounds of 'linguist' activate the linguist network, sounds of 'fish' activate the fish network
- Does the distinction ability mean understanding?

**Experience**
Experience

• Pattern of neural activities changes as a function of accumulated experience (physical characteristics and context in which an individual encounters)
• Neural activities reflects experiences
• Similar things also happen in similar context and elicit similar experience → similar pattern of neural activities
• Meaning → concepts about a particular entity that is influenced by experience of interacting with that entity → concepts of similar entities are overlapped because of similar associated contexts

Scientific Evidence

• Visual experience
• Environmental enrichment
• Bilingualism
• Drugs
• Nutrition
• Meditation??

Meaning of Word Combinations

Understanding the Other’s Mind


http://www.recordholders.org/en/list/lego.html
Studying the Mind

- Logicians in Philosophy
- Alan Granham
  - Meaning as mental equivalent of the language used to describe something
  - Meaning as mental equivalent what happens when one observes that something directly
  *By the window was a man with a martini.*
  *The man with the martini waved at the hostess.*
  *The man by the window waved at the hostess.*

Mental Worlds

- The entity that we want to communicate to others via language
- Endless possibilities!

*The winged unicorn flew high across the fiery skies.*

Materializing Mental Models

- Lego models:
  One-to-one mapping between model components and real-world entity components
- Mental models:
  One-to-one mapping between the neural activity that corresponds to the mental model and the neural activity that corresponds to the actual experience
Building a Mental Model

- Mental model’s lifetime exceeds that of the duration of the sentence.
- New sentences update the ever-changing mental model.
- We also make predictions when we read.

Words with Intangible Meanings

*In the mid-1990s, it was believed that a change of government would do the country some good.*

Try drawing a picture for each of the word in that sentence…

Summary of Chapter 9

- Language is the tool to bridge together sound and meaning.
- Sentence comprehension reflects the combination of semantics and syntax is far greater than the total semantics of each individual word.
- Meaning interpretation is influenced by experience and is related to activation of a neural network of a particular word ➔ concept of a word.
- Meaning is also a channel to access mental models, which is not restricted by the physical characteristics of the physical world.

Written Languages

- Spoken language does not last long.
- Written language is the channel that cradles culture and civilization.
- Earliest purpose of written languages is for trading ➔ ledgers.
- Early writings are pictorial-based ➔ hieroglyphic writing system: words made up of pictures and sounds.
Early Forms of Writing

- Cuneiform from Mesopotamia
- Egyptian demotic script


Evolving into an Efficient Writing System

- Written symbols refer to spoken languages rather than the actual entity
- Developing phonetic symbols to represent individual sounds
- Used in hieroglyphic and cuneiform scripts
- Combining phonemes
- Adopt different pitch patterns

Non-alphabetic Writing Systems

- Logograms: Chinese
- Pictophonetic compounds
  - Semantic radicals signify meaning
  - Phonetic radicals signify sounds
- But only 40% accuracy in sounding out the phonetic radicals

- Example: 
  - 媽 means "mother" 
  - 女 means "female" 
  - 马 means "horse" 
  - 马 means "horse"

Syllabaries

- Japanese
- Three types of written representations:
  - Hiragana: syllables represent original Japanese words
  - Katagana: syllables represent imported words
  - Kanji: Chinese characters

- Example: 
  - すし 寿司: "sushi" (Hiragana)
  - すし 寿司: "sushi" (Kanji)
  - ビール: "beer" (Kanji)
Learning to Read

- Home environment
- Written representation of sounds
  - Phonemic level
  - Syllabic level
- Transparency of grapheme-phoneme-correspondence (GPC)
- English: letter names ≠ letter sounds!!
- Whole-word approach using recognition

Whole-word Approach

fi yuo cna raed tihs, yuo hvae a sgrane mnid too
Cna yuo raed tihs? Olny 55 plepoe out of 100 can.
i cdnuolt blveiee taht I cluod aulactly uesdnatnrd
wah I was rdanieg. The phaonmneal pweor of the
hmuan mnid, aoccdrnig to a rscheearch at
Cmabridge Univerisy, it dseno't mtaetr in waht
oerdr the ltteres in a wrod are, the only iproamtnt
thng is taht the frsit and lsat ltteer be in the rghit
pclae. The rset can be a taotl mses and you can
stil raed it whotuit a pboerlm. Tihs is bcuseae
the huamn mnid deos not raed ervey lteter by istlef,
but the wrod as a wlohe. Azanmig huh? yaeh and
I awlyas tghuhot slpeling was ipmorantt! if you
can raed tihs forwrad it

Dual-route Access

- Recall Reynolds & Besner (2005) paper?
  DRC model describes exactly this situation
- Lexical route: whole-word approach
  because the words are already in the lexicon
- Non-lexical route: phonics approach
  because need to sound out the letters to help search for the meaning of the word

Next week

- Midterm exam
- 2 hours
- 6 definitions
- 5 short answers
- Library workshop