Psych229: Language Acquisition

Lecture 13
Words & Morphology

Pinker 1995: Past Tense Rule

“"My teacher holded the baby rabbits and we patted them"

Overregularization error

English past tense: happen between end of first year and end of second year
Means children have acquired “past tense rule” --ed

clawed /d/    folded /d/

Extracting the -ed rule (Yang, 2002)

Pinker 1995: Past Tense Rule

U-shaped development

want, came, saw, walked -->
good, comed, seed, walked -->

One idea: Children simply haven’t heard irregular counterparts enough to retrieve them reliably, so the -ed rule kicks in

Marcus & Pinker (supporting this idea): children make more errors on words parents don’t use as frequently

Also, kids are aware that the overregularized forms are wrong

Pinker 1995: Past Tense Rule

Also, if learning proceeds by analogy (pattern association), similar patterns should reinforce each other and reinforce overregularization errors

holded ~ folded ~ scolded ~ ...
drank ~ sank ~ drank

Pinker: No correlation between overregularization frequency & number of neighbors

However... what about the irregulars? Would analogy work there?

Irregulars fall into families, after all.

Pinker: Relation between overregularization and # of rhyming neighbors

The more rhyming irregular neighbors, the less overregularization

Yang 2002: Irregular Classes & The Free-rider Effect

same frequency (~20%), different performance:

- hurt, cut: 80%
- draw, blow, grow, fly: 35%

lower frequency, higher performance:

- hurt, cut (~20%): 80%.
- know (58), throw (31): 49%

higher frequency, lower performance (Abe)

- hurt (33), cut (21): 66%
- go, went (537): 64%, come, came (267): 26%
The Great Past Tense Debate

Pinker & Ullman: Rules or Words ("Words-And-Rules Theory")
(Rules) Regulars: generated by rule-like process of +ed (symbolic manipulation)
~GRAMMAR
(Words) Irregulars: stored separately in associative memory and retrieved
~LEXICON

Want to emphasize necessity of rules (grammar-like portion)
Grammar = system of productive, combinatorial operations that assemble smaller
pieces (e.g. morphemes & simple words) into larger pieces (complex words, phrases, sentences)

Blocking Principle for irregulars: try to retrieve irregular form from associative
memory, but if it fails use regular rule

This is different from older
generative phonology
theories (Chomsky & Halle)
that suppose there are
rules for everything, in
order to account for
patterns of regularity in
irregulars (ring-rang, sing-sang, etc.).

This is the approach taken
by Yang (2002), though.

No lexical entries, no combinatorial "apparatus" - just sound pattern associations,
transforming one sound form to another
Acquire families of sound patterns much more easily (e.g. patterns in irregular rules)
...but also produce odd output for novel forms (mail-membled), which is not what people do with novel forms.
Models that don’t do this have a built-in dedicated component for the +ed
connection (built-in rule)
Default rule doesn’t have to do with frequency of form either
- children regularize before onslaught of regular verbs
- German default plural ’s is only used in 7% of cases (default because used
  for unusual nouns, default error in childhood, etc.)

What if pattern associators had a semantic component so they could
 tell if a meaning was altered?
Problem: exocentric isn’t the same as semantically different - it’s a particular kind
of semantically different.
If pattern associator has component that notices exocentric for noun-like verbs
“ring” (to ring, a ring), this is like implementing morphological knowledge already.
Also requires lots of training of exocentric verbs with regular past tense, which is
data children don’t normally get.
Declarative/Procedural Hypothesis:
- lexical/irregular: hippocampus & medial lobe structures (declarative)
- grammatical/regular: basal ganglia & frontal cortex (procedural)

1) Separable memory
- Irregulars: psychological, linguistic, neuropsychological traces of lexical memory
- Regulars: psychological, linguistic, neuropsychological traces of grammatical processing

2) "Elsewhere" rule for +ed
When memory fails for irregulars, use +ed rule for past tense.

Results for brain-lesioned patients: predicted double dissociation
- Agrammatism: more trouble inflecting regular than irregular
- Anoma: more trouble irregular & overregularized

Pinker & Ullman on Words-And-Rules neural basis