Regular and Irregular Verbs: Part 2
Informatics 1 CG: Lecture 4

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Reading:
Steven Pinker’s, Words and Rules, Chapters 3 and 7

Recap: Words and Rules

- Theory of words and rules.
- Does it explain regular and irregular verbs?
- How can it be changed/refined to account for the fact that irregular verbs are also semi-systematic?
- What does evidence from language development tell us about regular and irregular verbs?
- What are possible theories/models of the linguistic data?
- Are they cognitively plausible?

Irregular Inflection is Semi-systematic

- Irregular verbs seems to display some patterns!
- Suppletion (e.g., go → went) is exception rather than rule.
- These patterns are the fossils of rules that lived in the minds of Old English speakers.
- But, evidence suggests that these patterns are represented, in some way, in the minds of modern-day English speakers.

- blow-blew, grow-grew, know-knew, . . .
- bind-bound, find-found, grind-ground, . . .
- drink-drank, shrink-shrank, sink-sank, . . .
- bear-bore, wear-wore, swear-swore, . . .
Irregular Verb Patterns

**Stem-past similarity**
Stems and their past tense alternants show non-random levels of sound similarity (e.g., *drink*-drank share [dr_nk]).

**Change-change similarity**
a few kinds of stem-past alternations are seen over and over again in the irregular verbs; e.g., the [i]-[a] alternation accounts for a large proportion of verbs (e.g., *drink*, *sing*, *begin*).

**Stem-stem similarity**
the stems in certain classes of strong verbs show non-random levels of sound similarity ([i]-[a] verbs tend to end with either -nk, -ng, or -n (e.g., *drink*, *sing*, *begin*, *shrink*, *sink*, *spring*). Why is the human mind so impressed by sound similarity?

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1 Verbs in which a vowel inside the verb is changed to indicate different tenses.

Problems with the SPE Theory of Irregular Verbs

Q1: How could a child possibly learn these rules?
Q2: Why would a child even bother to learn these rules?
Q3: Is it not simpler to just memorize the past forms by rote?

- English speakers can produce irregular forms much more quickly than the regular forms; if they applied rules, it would take them longer (retrieval is faster than computation).
- SPE is not meant to be a theory of how children learn words or how adults represent words in their minds.
- Importantly, SPE fails to explain stem-stem similarity (*grow*-grew, *blow*-blew but *glow*-glowed, *show*-showed).

But how do children actually learn the past tense?
Stages of Language Acquisition

18 months *children start to produce two-word microsentences*

*See baby!*, *More cereal!*

*All gone sticky!* (i.e., my hands are clean)

*Circlet toast* (i.e., I want a bagel)

2 years *children produce longer, more complicated sentences. They start to use grammatical morphemes: inflectional suffixes (e.g., -ed, -s, -ing)

auxiliary verbs (e.g., have, be, do, will)

3 years *children start to make errors, by attaching -ed to ir-

regular verb stems and pass the wug-test. (e.g., sing-

-ed, bleed-ed; bing-binged).

U-Shaped Learning

Children’s performance gets better as they get older. With inflectional morphology they get worse before getting better. This is what child psychologists call U-shaped development.

**Stage 1** children produce both regular and irregular past tense forms with very few errors.

**Stage 2** after a certain amount of time, the error rate appears to increase significantly; children add regular past tense suffix -ed to irregular verb stems even with verbs whose past tense forms they had previously mastered.

**Stage 3** the error rate slowly decreases, as the child gets older, until almost no errors are made.

Overzealous Grammarians

Children don’t just overgeneralize from regular past tense forms!

- they overuse the plural suffix -s (mans, foots, tooths, mouses)
- they overuse the third person sing suffix -s (haves, do’s, be’s)
- they overuse the comparative -er and superlative suffixes -est (specialer, powerfuller, gooder)
- they overuse the ordinal suffix -th on numerals (oneth, twoth)
- Children find regularity in the oddest places.

Parent: No booze in the house!

Child: What’s a “boo”?

Child: “It did! It snew!”

[After being told it was going to snow.]

U-Shaped Learning

- U-shaped learning in early childhood cognitive development.
- Child uses *spoke*, then *spaked*, and later again *spoke*. 

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Children versus Adults

- The sudden deterioration in performance appears to be evidence for mental reorganization.
- The child has inferred a new generalization involving previously unrelated concepts.
- The rule which says “add -ed to form the past tense”.

Why is it that only children generate overregularization errors like bleeded and singed?

**Guess 1**
Adults communicate their thoughts more clearly than children by slowly learning to do that.

**Guess 2**
Adults don’t say bleeded and singed because they don’t hear other adults saying these words.

**Guess 3**
Adults have learned the blocking principle: sang blocks the past-tense rule from applying to sing.

Learning how to Block

**Q1:** How could a child learn the blocking principle from scratch?

**A1:** They would need to learn explicitly that overregularized forms like bleeded and singed are ungrammatical, i.e., they need to have negative evidence to solve the problem.

**Q2:** What would this negative feedback be?

**A2:** An explicit correction, an indirect signal of disapproval (a frown, a puzzled look, a slap) or a failure to achieve some non-linguistic goal.

**Q3:** Is there evidence that negative feedback has any effect on children’s language acquisition?

**A3:** The answer is no!

Negative Feedback

“Mommy Dolly hitted me,”
“Dolly HIT me.”
“You too?! Boy, she’s in trouble!”

Karin Stromswold and Subject AS

- The child could not talk but understood complex sentences.
- Gave dog a bone when it spoke correctly and a rock otherwise.
- Bones: heated, baked, showed, sewed. Rocks: eated, taked, knowed.
- Child recognized that forms were ungrammatical without making an error and noting parents’ response.
Blocking as Innate Knowledge

Hypothesis
Blocking principle is part of innate linguistic knowledge; children don’t learn it from evidence that *singed* is not in English. They deduce that *singed* is not in English from the blocking principle.

Why do adults use blocking more effectively than children?
- Because they have more experience than children. They have heard irregular past tense verb forms being used more often.
- And memory retrieval improves through repetition.
- Adults retrieve the irregular verb forms from memory more quickly, and hence blocking is more likely to happen.
- Children are “little adults with bad memories”.

A Little Experiment

What is the past-tense form of the verb *shend*?

*shend* means to shame

*shended* *shent*

If you have answered *shended*, you have overgeneralized.

The error is to be expected! Irregular forms are not predictable. The only way you could have produced *shent* is if you had previously heard and remembered it.

Many verbs will be like *shent* for the child; she hasn’t heard them enough times to recall them on demand!

Theories of Regular and Irregular Verbs

Hypothesis A
Regular past tense forms are formed by a rule. Irregular past tense forms are stored and retrieved as words.

Hypothesis B
Irregular past tense forms are also generated by rules. SPE captures irregular verbs with just three rules!

Hypothesis C
Regular past tense forms are formed by a rule which is blocked for irregular verbs. Blocking principle is innate.

Hypothesis D
There are no rules, only a general associative mechanism for recognizing patterns; reason by analogy.
Can the study of regular and irregular English verbs shed light on how language works?

- Irregular verbs display some patterns, which sheds doubt on the words and rules theory.
- SPE proposes rules for irregular verbs too, but they are too rigid; there's always exceptions, rule membership fuzzy.
- Perhaps words and rules theory can be salvaged, through innate blocking principle.
- Or, there are no rules at, all we need is a mechanism for recognizing patterns.

**Next lecture:** connectionism and neural networks.