Language Acquisition

Psycholinguistics

LING/PSYC 27010

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agenda for today

1. housekeeping
2. from last time
   - notions of 'grammar'
   - anything else?
3. where we're heading
4. readings
5. lecture & discussion

on thurs: discussion of Snedeker & Gleitman (2004); Markman (1990); Smith & Yu (2008) papers

brief points about the readings

- important to distinguish what is in competition with what:
  - UG versus everything is statistical learning (the "swiss army knife"-only approach)
  - generative grammar versus usage-based linguistics
- problem can be (kind of) reduced to
  - how much of the cognitive machinery recruited in language learning is language-specific? (i.e. not domain-general)
  - EiSL says none or very little
  - UG says a lot

history of L1A theory

- when thinking about motivations behind a theory, it is important to keep in mind intellectual paradigms and trends in the history of science in general
- linguistic theories reflect broad intellectual sentiment at the time of their development

history of L1A theory

1. Skinner (*Verbal Behavior*)
   - behaviorism, operant conditioning, positivism
2. Chomsky (*Syntactic Structures* et seq.)
   - infancy of theoretical computer science, applications of mathematical logic
3. Tomasello, Ferreira, others (lots of recent work)
   - raw computing resources/power exponentially increasing, rise of the machine...learning model

this week: tension between 2. and 3.

the chomskyan theory of L1A

- **nativism**
- **Universal Grammar**
- *not* the same as **Generative Grammar**

ex. Nicaraguan Sign Language

the chomskyan theory of L1A

central argument:

Poverty of the Stimulus

the "statistical learning theory" of L1A

language recruits similar cognitive resources as other mental tasks

language is not innate – rather, it developed over time in a historical and social context

we transmit language so successfully because we are really smart!

(roughly)

both theories are quite abstract

adjudicating between them requires looking at facts

agenda:

- **rest of today**
  we look at the language acquisition process in broad strokes
- **thursday**
  we look at key experimental evidence that purports to adjudicate between the two theories

the process of first language acquisition

the critical period

- language learning takes place **early** in life (first "several" years)
- lack of exposure to language during this **critical period** can be detrimental to language development

ex. genie

methods for studying language acquisition

- **naturalistic studies** – observe and/or measure infant/child behavior
- **controlled experiments** – systematically manipulate stimuli and compare behavioral responses between conditions
  - sucking behavior as a measure of stimulation (associated w novelty)
  - eye-gaze as a measure of attention
- **learning curve estimation** – use adult processing for indirect evidence (more on Thurs)

stages of linguistic development

1. babbling stage (4-12mo) - producing real speech sounds - but don't necessarily correspond to environment language
2. holophrastic stage (starts around 12-14mo) - start recognizing associations between words and meanings - cognitive heuristics and biases start to emerge
3. two-word stage (starts around 2yo) - words combined in non-random ways - the beginnings of syntax
4. telegraphic stage (variable, after 2yo) - syntax of environment language increasingly present in child speech

production-comprehension gap

importantly, there is evidence of a **production-comprehension gap** in first language acquisition

question: how could you know this?

acquiring sounds: babbling stage

- the earliest "language" production in humans comes in the form of babbling
- what does infant babbling sound like?
  - maybe: "goo goo ga ga," "mama dada," "papa"
  - but not: "thoo thoo scra scra," "mast datsa"
- why?

acquiring sounds: babbling stage

- the most frequent sounds in the world's languages are disproportionately represented in infant babbling
- CV syllables also disproportionately represented
- babbling patterns show regularities across cultures and linguistic environments

acquiring words: holophrastic stage

- children begin to produce legitimate words of the environment language
- the order in which words are learned is *not* random
  - nouns before verbs
  - concrete before abstract

question: why?

$\Longrightarrow$ do the reading for Thursday!

acquiring meaning: holophrastic stage

- children learn to associate words with "things" (intentionally vague)
- how do they do this?

acquiring meaning: holophrastic stage

biases and heuristics

- type assumption (cf. *token*)
  new words refer to a type of thing, not a particular thing.
- whole object assumption (e.g. "gavagai")
  new words refer to whole objects, not just their substance, color, or parts.
- mutual exclusivity bias (Markman 1990; 1994)
  new words don't refer to things that already have names

acquiring syntax: telegraphic stage

children start producing sentences – but they don't start out perfect

- *i sit*
- *me food*
- *all gone*
- *we go bye bye*
- *doggy bited her*
- *teacher holded the babby rabbit*
- *kitty want to eat the mouses*
- ...

insights from grammatical mistakes

grammatical mistakes in early speech are not randomly distributed

what can we learn from patterns in early syntactic/morphological mistakes?

ex. irregular past tense, irregular plurals

insights from grammatical mistakes

a theory:

- language involves a combination of associative memory and symbol-manipulation rules (see Pinker's "Words and Rules" theory)
- the two cognitive mechanisms do not necessarily develop at the same speed

insights from grammatical mistakes

an alternative:

- result of analogical reasoning,
- over time, additional evidence makes analogy less attractive
- therefore children eventually fix their grammatical mistakes

for next time

read the assigned papers closely

come to class prepared with questions/thoughts/etc.