Language development

PSY 200
Greg Francis
Lecture 30

When should you learn a foreign language?

Learning

- What is learned?
- How does a child learn?
- How much about language does a child know?
- When have you mastered language?
- How do you learn a second language?
- What do babies do?

Babies and phonemes

- When the syllable changes
  - babies suck more often
  - ba, ba, ..., pa, pa, pa, pa, pa, ...

Language

- Instinctive
  - your brain is wired to work with grammars, words, phrases
- Learning
  - you do have to learn some specifics for your native tongue
  - rules
  - words

Babies and phonemes

- Infants have linguistic skills as soon as they are born
  - babies are interested in new things
  - attach a tape player to a pacifier
  - each suck causes the player to play a sound
- Repetition of the same sound leads to boredom and fewer sucks
  - ba, ba, ba, ba, ba, ba, ba, ba,

- Babies and phonemes
  - Moreover, the way they hear things is similar to adults
    - you can change the pronunciation (voice onset timing) of /ba/ and still hear it as /ba/ (CogLab data)
    - But too big a change in VOT turns it into /pa/
    - babies hear it the same way
  - CogLab data:
    - Identification task
    - Discrimination task
Babies

- Babies hear all phonemes, even ones their parents cannot distinguish
- Babies, even newborns, do show a preference for what will become their native tongue
  - occurs because they hear mother’s voice while in the womb
- Mostly prefer the melody, stress, timing
  - French infants like French and Italian equally well
    - playing language backwards keeps many consonants but distorts melody (babies are not interested)

Babbling

- Babbling sounds are the same in all languages
  - patterns are common across languages
- By the end of the first year babies combine syllables to sound like words
  - neh-nee
  - da-dee
  - meh-neh
- Babbling is important
  - children who do not babble often show slower speech development
  - deaf children babble with hands, if parents use sign language

Language development

- Between 5-7 months, babies start making sounds
  - clicks, hums, hisses, smacks,…
- Between 7-8 months babies start babbling in syllables
  - ba-ba-ba-ba-ba
  - neh-neh-neh
  - da-da-da-da-da

Language stages

- Nearly all children learn language in stages
  - 1) Cooing (first several months)
  - 2) Babbling (~6 months)
  - 3) One word utterances (~1 year)
  - 4) Two-word utterances and telegraphic speech (1-3 years)
  - 5) Basic adult sequences with grammar (~4 years)
- The rate of learning varies substantially

Babbling teaches child how sequences of muscle combinations lead to different sounds
- necessary to produce speech
- By about 10 months babies learn the sounds of their native tongue
  - they can no longer distinguish phonemes that are not part of the language
  - Part of learning is forgetting!

Learning words

- Children learn words with ridiculous ease
- An average 6 year old knows 13,000 words
  - learned one new word every two waking hours
  - this is without knowing how to read!
- The average high school graduate knows about 60,000 different words (not counting compound words and such)
  - means that in 17 years of life (not counting the first one), they learned an average of 10 new words each day (one word every 90 waking minutes)
**Age of Acquisition**
- Word learning is an integral part of human knowledge, with lasting effects.
- CogLab experiment used a Lexical decision task to measure reaction time to words that were
  - Learned relatively early in life (Early AoA: age 6 or sooner)
  - Learned relatively later (Late AoA: age 7 or later)
  - 168 participants

**Around 18 months**
- Children learn simple rules of syntax
  - All dry.  All messy.  All wet.
  - I sit.    I shut.    No bed.
  - No pee.  See baby.  See pretty.
- Content is similar for all languages
  - objects appear, disappear, move,…
  - people do things, see things,…
  - ask questions, who, what, where,…

**All hell breaks loose**
- After mastering 2-word strings, toddlers go crazy on language
- Consider changes in language (year;month)
  - (2;3) Play checkers. Big drum. I got horn.
  - (2;5) Now put boots on. Where wrench go? What that paper clip doing?
  - (2;7) Ursula has a boot on. Shadow has hat like that.
  - (2;9) Where Mommy keep her pocket book? Show you something funny.
  - (2;11) Why you mixing baby chocolate? I finishing drinking all up down my throat.
  - (3;1) You went to Boston University? Doggies like to climb up.

**Expected errors**
- Consider a child hearing adults talk and how they might incorrectly apply what they learn
- Out of 66,000 sentences, children never made these errors
  
<table>
<thead>
<tr>
<th>Grammatical</th>
<th>Not grammatical</th>
</tr>
</thead>
<tbody>
<tr>
<td>He seems happy. --&gt; He is smiling.</td>
<td></td>
</tr>
<tr>
<td>Does he seem happy?</td>
<td>Does he be smiling?</td>
</tr>
<tr>
<td>He did eat. --&gt; He didn’t eat.</td>
<td>He did a few things. --&gt; He didn’t a few things.</td>
</tr>
</tbody>
</table>

**Errors**
- Three year olds make lots of grammatical errors
  - that is because there are lots of opportunities for errors
  - but pick any particular grammatical rule and you find most three year olds obey it most of the time
  - this is amazing because there lots of cases that you would expect would be difficult to learn
- Children do make errors, but the errors are consistent with rules of language
  -  - to pluralize a noun
    - Mouses, leafs
  -  -ed to make the past tense of a verb
    - My teacher holded the baby rabbits and we patted them.
    - Hey, Horton heared a Who.
    - I finded Renee.
    - Once upon a time a alligator was eating a dinosaur and the dinosaur was eating the alligator and the dinosaur was eaten by the alligator and the alligator goed kerplunk.
Overgeneralization

- These past tense forms sound wrong because English has around 180 irregular verbs
  - inherited from other languages
  - These past-tense forms are not derived from rules
- Irregular forms have to be memorized, word by word
- If a child cannot remember (in its lexicon)
  - s/he defaults to the rule
- These errors are for the most difficult parts of a language to learn
  - Because they don’t follow the normal rules

Syntax errors

- Children make similar mistakes in applying grammatical rules
  - In English there is a causative rule that applies to some verbs and not others
    - takes a verb meaning “to do something” and converts it to a verb meaning “to cause to do something”
  - Thus you can say
    - The butter melted. --> Sally melted the butter.
    - The ball bounced. --> Hiram bounced the ball.
  - But you can’t say the second of each pair
    - I like sausage. --> I am liked of sausage.
    - I giggled. --> Sally giggled me.

Syntax errors

- Adults also misapply the causative rule
  - Sparkle your table with Cape Cod classic glass-ware.
  - Well, that decided me.
  - This new golf ball could obsolete many golf courses.
  - If she subscribes us up, she’ll get a bonus.
  - Boiler up!
- Children’s errors tend to track the more difficult aspects of a language, relative to other languages
  - Adults make the same kinds of mistakes for still more difficult to remember cases

Overgeneralizations

- We know this is the most difficult part of language because adults make the same kind of mistakes
  - tread - trod
  - dwell - dwelt
  - rend - rent

- Sound weird because we do not often hear them
  - many adults “regularize” the words
  - treaded, strived, dwelled, slain, rended, smited
  - thus language changes...

Syntax errors

- Children over generalize application of the causative rule to inappropriate verbs
  - I go to the bathroom. --> Go me to the bathroom.
  - Aunt Jane died. --> The tiger will come and eat David and then he will be died and I won’t have a little brother anymore.
  - I drink with a cup. --> Yawny Baby - you can push her mouth open to drink her.
  - Many of these errors would be fine in other languages!
  - The situation is similar to the special past tense verbs
    - This rule must be memorized as applying to some verbs and not others

Second language

- It is difficult (and rare) for an adult to become fluent in a second language
  - children do it easily
  - What accounts for the difference?
    - most likely it is age
    - there seems to be a critical period during which language can be learned
    - beyond age six (or so) it becomes more difficult to learn a language (first or second)
Second language

- High school and college (or later) is too late for most people to completely learn a second language.
- It should be in kindergarten or preschool.
  - There is still value in learning a second language as an adult; just have realistic expectations!
- Immigrants who arrive after age 6 may never fully learn a second language.
- Children who fail to learn any language by age 6 never do.
  - They might create a pidgin of some sort.

Conclusions

- Language development
- Stages of learning
- Errors
- Second language

Next time

- Language & brain
- Broca’s aphasia
- Wernicke’s aphasia
- Anomia
- Language ability of chimps
- What’s the big deal about Nim Chimpsky?