Linguistics 101
Language Acquisition
Language Acquisition

• All (normal) human children...
  • learn a language.
  • can learn any language they are exposed to.
  • learn all languages at basically the same rate.
  • follow the same stages of language acquisition.
Language Acquisition

• Children’s acquisition of language occurs...
  • quickly
    • adult-like grammar after about 5-6 years
  • without explicit instruction
  • uniformly
    • uniform stages of acquisition
    • uniform results
Language Acquisition

- What must a child learn?
  - The sounds of a language (phonetics)
  - The sound patterns of a language (phonology)
  - Rules of word-formation (morphology)
  - How words combine into phrases/sentences (syntax)
  - How to derive meaning from a sentence (semantics)
  - How to properly use language in context (pragmatics)
  - Lexical items (words, morphemes, idioms, etc)
Innateness Hypothesis

• Living organisms have innate behaviors:
  • newly-hatched see turtles move toward ocean
  • honeybees perform dance for communication
  • birds fly

• The ‘Innateness Hypothesis’ argues that our ability to acquire (human) language is innate (genetically encoded).
  • not simply derived from other human cognitive abilities
  • Language Acquisition Device (LAD)
Innateness Hypothesis

• Attempts to Explains:
  • speed of acquisition
  • ease of acquisition
  • uniformity of acquisition process
  • uniformity in adult language
  • universalities across languages
Universal Grammar

- Universal Grammar (UG) refers to the “set of structural characteristics shared by all languages”
  - Innateness Hypothesis takes UG to be innate.
  - UG is not, however, dependent on innateness hypothesis.

- The goal of theoretical linguistics is to discover the properties of UG.
Sign Language - Innateness of UG

• Overview of sign languages:
  • have gesture system (cf. phonology)
  • have morphology rules
  • have syntactic rules
  • have semantic rules
  • have dictionary of arbitrary signs

• Support for innateness:
  • acquired without explicit instruction
  • acquired in similar stages as spoken language
Sign Language – Innateness of UG

- Case Study: Nicaraguan Sign Language (NSL)
  - NSL didn’t exist before 1980.
  - School for deaf children opened.
  - Teachers used only limited signs (for the alphabet).
  - The deaf children naturally and quickly created their own sign language.
  - NSL quickly became a full-fledged language.

(For more info about new languages arising in such a manner, see Files 12.3 and 12.4 (Pidgins and Creoles))
Theories of Acquisition

1. Imitation
2. Reinforcement
3. Active Construction of a Grammar
4. Connectionist Theories
Imitation

- Main idea: children imitate what they hear

- Evidence:
  - Specific languages are not transferred genetically.
  - Words are arbitrary, thus children must hear them to ‘imitate’ them.
Imitation

• Problems:
  • Children produce things not said by adults.
  • Children’s ‘mistakes’ are predictable and consistent.
  • Children often fail to accurately mimic adult utterances.
  • Children produce and understand novel sentences.
  • Children may invent a new language in the right circumstances.
Reinforcement

• Main idea: children learn through positive and negative reinforcement

• Evidence:
  • very little
Reinforcement

• Problems:
  • ignores how children initially learn to produce utterances
  • rarely occurs
  • fails when it does occur
  • fails to explain
    • children’s own grammar rules
    • why children seem impervious to correction

• Role of reinforcement limited to ability to be understood or not.
Imitation / Reinforcement

Child: Nobody don’t like me.

Mother: No, say ‘Nobody likes me.’

Child: Nobody don’t like me.

(discourse repeated eight times)

Mother (now exasperated): Now, listen carefully. Say ‘Nobody likes me.’

Child: Oh, nobody don’t likes me.
Imitation / Reinforcement

Child: My teacher holded the baby rabbit and we patted them.

Adult: Did you say that your teacher held the baby rabbit?

Child: Yes.

Adult: What did you say she did?

Child: She holded the baby rabbit and we patted them.

Adult: Did you say she held them tightly?

Child: No, she holded them loosely.
Active Construction of a Grammar

- Children invent grammar rules themselves.
- Ability to develop rules is innate.
Active Construction of a Grammar

• Acquisition process:
  • Listen
  • Try to find patterns
  • Hypothesize a rule for the pattern
    • e.g. past tense /-ed/
  • Test hypothesis
  • Modify rule as necessary

• i.e. Children have a ‘working grammar’.
Active Construction of a Grammar

• Explains what imitation/reinforcement can’t:
  • children are expected to make mistakes
  • children are expected to follow non-random patterns
  • regression

• Explains why children fail to accurately produce adult forms
  • child grammars differ from adult grammars

• Problems:
  • says nothing about what patterns are learnable
Connectionist Theories

- Claims that exposure to language develops and strengthens neural connections.
- Higher frequency $\rightarrow$ stronger connections
  - allows for exploitation of statistical information
  - ‘rules’ derived from strength of connections

Evidence:
- there are clear frequency effects in some aspects of language
  - e.g. ‘blick’ tests conforming to frequency of sound sequences
- there are clearly neural connections
  - e.g. easily seen with linguistic priming tests
- predicts ‘errors’ based on frequency effects
  - e.g. sing-sang-sung, ring-rang-rung $\rightarrow$ ding-*dang-*dung
Connectionist Theories

• Problems:
  • predicts that any pattern is learnable by humans, but this is demonstrably false
Summary of Theories

• To account for language acquisition:
  • *Imitation* is necessary but not sufficient.
  
  • *Reinforcement* is virtually unsupported.
  
  • *Active Construction of a Grammar* nicely accounts for predictable deviations from adult grammars, and the various stages of grammar development.
  
  • *Connectionist* theories account for frequency effects, can also account for regular deviations from adult grammars.
  
  • *Active Construction of a Grammar* and *Connectionist Theories* are not mutually exclusive.
  
  • To account for linguistic universals and the absence of certain patterns in language, we must assume a type of *Universal Grammar*.
Critical Period

• Is there a ‘critical’ period for language?
  • child vs. adult language learning
  • native vs. nonnative speakers
  • cf. age of immigration and language ability
    • arrive before age 6 → generally pass as native speakers
    • arrive after puberty → generally do not pass as native speakers
Critical Period Hypothesis

• basic idea: there is a critical period in development during which a language can be acquired like a native speaker

• strong hypothesis: after this critical period, it is impossible to acquire a language as well as a native speaker

• weak hypothesis: there are ‘sensitive periods’ during which the ease of learning certain aspects of language decline
  • different aspects of language (e.g. phonology, syntax) have different sensitive periods
Critical Period Hypothesis

- Evidence:
  - ‘feral children’
  - ‘Genie’
    - isolated for 13 years
    - similar stages of language acquisition as children (1-word, 2-word...)
    - learned many words rather quickly
    - never fully developed syntax or morphology
Critical Periods

• Other critical periods?
  • Some birds will follow first moving object they see within the first day or two (mother or not)

• Some birds have a critical period in learning their group’s (species+region) bird song.

• Other fields also talk about critical periods
  • vision
  • musical ability (perfect pitch)
  • ...

Stages of Development

0. Prelinguistic

• babies make noises, but not yet babbling
  • crying, cooing
  • response to some stimuli (hunger, discomfort...)
• sensitive to native and non-native sound distinctions
Stages of Development

1. Babbling
   - starts at about 6 months of age
   - not linked to biological needs
   - pitch and intonation resemble language spoken around them
2. One-word

- begins around age 1
- speaks one-word sentences (called ‘holophrastic’)
- usually 1-syllable words, with CV structure
- consonant clusters reduced
- words learned as a whole, rather than a sequence of sounds
- ‘easier’ sounds produced earlier
  - Manner:
    - nasals > glides > stops > liquids > fricatives > affricates
  - Place:
    - labials > velars > alveolars > palatals
- better perception than production (e.g. difficult sounds like [r])
## Stages of Development

2. One-word:

<table>
<thead>
<tr>
<th></th>
<th>Utterances</th>
<th>Child</th>
<th>Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>don’t</td>
<td>[dot]</td>
<td>[dont]</td>
</tr>
<tr>
<td>2</td>
<td>skip</td>
<td>[kʰɪp]</td>
<td>[skip]</td>
</tr>
<tr>
<td>3</td>
<td>shoe</td>
<td>[su]</td>
<td>[ʃu]</td>
</tr>
<tr>
<td>4</td>
<td>that</td>
<td>[dæt]</td>
<td>[ðæt]</td>
</tr>
<tr>
<td>5</td>
<td>play</td>
<td>[pʰeɪ]</td>
<td>[pʰleɪ]</td>
</tr>
<tr>
<td>6</td>
<td>thump</td>
<td>[dʌp]</td>
<td>[θʌmp]</td>
</tr>
<tr>
<td>7</td>
<td>bath</td>
<td>[bæt]</td>
<td>[bæθ]</td>
</tr>
<tr>
<td>8</td>
<td>chop</td>
<td>[tʰæp]</td>
<td>[tʃæp]</td>
</tr>
<tr>
<td>9</td>
<td>kitty</td>
<td>[kʰɪdi]</td>
<td>[kʰɪɾi]</td>
</tr>
<tr>
<td>10</td>
<td>light</td>
<td>[waɪt]</td>
<td>[laɪt]</td>
</tr>
<tr>
<td>11</td>
<td>dolly</td>
<td>[dawɪ]</td>
<td>[dali]</td>
</tr>
<tr>
<td>12</td>
<td>grow</td>
<td>[go]</td>
<td>[gro]</td>
</tr>
</tbody>
</table>
Stages of Development

3. two-word stage

- starts at about 1.5-2 years of age
- vocabulary of +/- 50 words
- sentences consist of two words *(telegraphic)*
  - e.g. allgone sock
- those two words could have a number of relations
  - e.g. Daddy car
- usually lacks function words
- usually lacks inflectional morphology
Stages of Development

3. two-word stage

- occur in fixed order (depending on language)
  - agent + action  baby sleep
  - action + object  kick ball
  - action + location  sit chair
  - entity + location  teddy bed
  - possessor + possession  mommy book
  - entity + attribute  block red
  - demonstrative + entity  this shoe
Stages of Development

4. beyond 2-word stage
   • sentences with 3+ words (no 3-word stage)
   • begins using function words
   • have already learned some aspects of grammar:
     • word order (e.g. SVO in English, SOV in Japanese)
     • position of determiners
     • etc.
   • grammar resembles adult grammar by about age 5