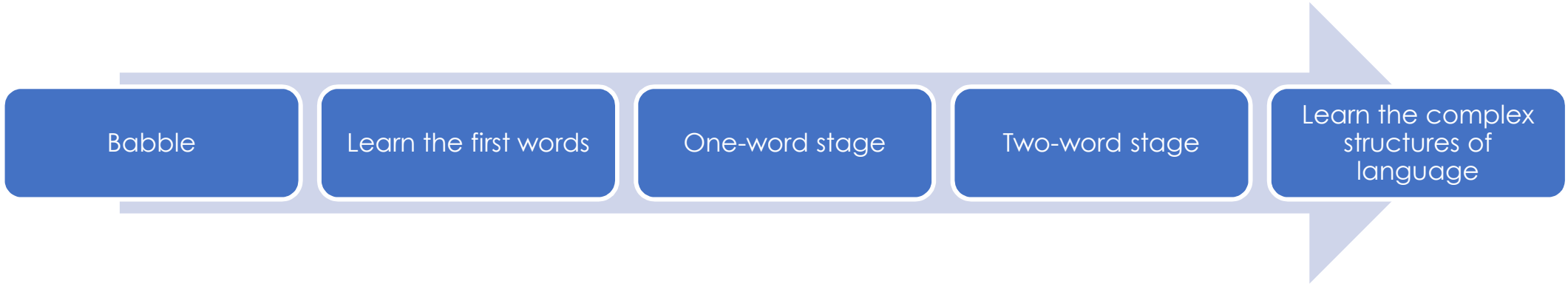
Language Acquisition

What is Language Acquisition?

- Part of our ability to acquire language is innate.
- Children learn language by "inventing" the rules specific to their language.
- Stages of language development
  - All children go through the same stages of language development!



Theories of Language Acquisition

- Children must acquire a grammar with all its components and rules as well as knowing words
- Rules, unlike words, are never explicitly stated, so the child cannot just memorize them: he/she must somehow figure the rules out on his own—a remarkable intellectual feat.

The Innateness Hypothesis

- Language ability is innate in humans
- Humans are genetically predisposed to acquire and use language (though not any particular language)
- Babies are born with the knowledge that languages have patterns and with the ability to seek out and identify those patterns
- Humans have innate knowledge of some core characteristic common to all languages called "linguistic universals"
- Universal Grammar (UG): the theoretically inborn set of structural characteristics shared by all languages

- Biologist Eric Lenneberg developed a list of characteristic that are typical of innately determined behaviors
- Innate behaviors are present in all normal individuals of a species, whereas learned behaviors are not. e.g. walking vs playing the piano, riding a bicycle

(1) Lenneberg's characteristics of biologically controlled behaviors (File 8.1.2, p.314)

1. The behavior emerges before it is necessary.
2. Its appearance is not the result of a conscious decision.
3. Its emergence is not triggered by external events (though the surrounding environment must be sufficiently "rich" for it to develop adequately).
4. Direct teaching and intensive practice have relatively little effect.
5. There is a regular sequence of "milestones" as the behavior develops, and these can usually be correlated with age and other aspects of development.
6. There is likely to be a "critical period" for the acquisition of the behavior.

- Critical period: from birth to the onset of puberty. Acquisition will fail if it is attempted either before or after the critical period
  - A critical period may exist for certain aspects of language (syntax in first-language acquisition and phonology in second-language acquisition), but not for others

(2) Genie was found in 1970 when she was nearly fourteen years old. She had been abused and isolated since the age of twenty months. When first discovered, Genie was completely silent. Thereafter he language acquisition was extremely slow, and although she did learn to speak, her speech was abnormal. She was able to memorize many vocabulary items, but her expressions were formulaic, as in *what is X* and *give me X*. She never learned grammar.

https://www.youtube.com/watch?v=VjZolHCrC8E

https://www.youtube.com/watch?v=hmdycJQi4QA

(3) Isabelle was discovered in 1937 at the age of six and a half. Her mother was deaf and could not speak. Isabelle's grandfather had kept Isabelle and her mother isolated but had not otherwise mistreated them. Isabelle then began lessons at The Ohio State University, and although her progress was at first slow, it soon accelerated. I tow years her intelligence and her language use were completely normal for a child her age.

Support the Critical Period Hypothesis?

- Genie: It may not be the lack of exposure to language but rather a larger trauma that prevents her from acquiring language properly.
- Isabelle: Prior to being found Isabelle was locked in a room with her mother, and although her mother could not speak, they developed a rudimentary person gesture system to communicate.
- ISN(Idioma de Signos Nicaragense): in a school for the deaf in Nicaragua, only younger children learn the pidgin sign language while teens and adults have difficulty learning it.

Imitation Theory

- Children learn language by listening to the speech around them and reproducing what they hear, i.e. by memorizing the words and sentences of some language
- True
  - Children cannot guess what the words of their target language are; they must hear the words used by other speakers, and then reproduce or "imitate" them.
  - Children learn the language that is spoken around them; a child's genetic makeup has nothing to do with which language the child will acquire
- Not true
  - Errors: Children's speech differs from adult norms:
    - 2 yrs *nana* (banana); 3 yrs *Mommy tie shoe*; 4 yrs *hitted* (hit), *goed* (went)
  - Rules: The child who says *hitted* has a rule in her internal grammar which adds *–ed* to a verb to make it past tense.
  - Productivity: children and adults are able to produce and understand new sentences they have never heard before.

Reinforcement Theory

- Children learn to speak like adults because they are praised, rewarded, or otherwise reinforced when they use the right forms and are corrected when they use wrong forms.
- Not true
  - Corrections seldom happen; parents' corrections are more to do with the accuracy or truth of a statement than with its grammatical form.
  - Even when adults do try to correct a child's grammar, the attempts usually fail.

    (4) Child: Nobody don't like me.

    Mother: No, say "nobody likes me."

    Child: Nobody don't like me.

    (repeated 8 times)

    Mother (now exasperated): Now listen Carefully! Say, "Nobody likes me."

    Child: Oh! Nobody don't likes me. (p318)
  - Rules: The child's way of forming negative sentences involving *nobody* is completely regular; the child must possess a rule.

Active Construction of a Grammar Theory

- The most influential theory of language acquisition
- Children actually invent the rules of grammar themselves.
- The ability to develop rules is innate
- The actual rules are based on the speech children hear around them, their input or data for analysis
- e.g. Past tense rule
  1. Form an early hypothesis about the past tense formation: to add *–ed*
  2. All past tense verbs would be constructed with this rule: *holded, eated, needed, walked*
  3. Discover that not all past tense forms follow this rule
  4. Modify the rule and add another one to produce the additional forms
  5. Create and edited his or her own grammar to the point where it matches an adult's grammar
- Children's mistakes are expected to occur and to follow non-random patterns
- The child must make the connection in his or her own time; active reinforcement does not help

Connectionist Theories

- Children learn language by creating neural connections in the brain.
- A child develops such connections through exposure to language and by using language; the child learns associations between words, meanings, sound sequences, and so on.
- e.g. *bottle*: establish neural connections every time the word is heard to:
  - *bottle*; /b/; *milk*; what the bottle looks like; the activity of drinking; . . .
  - Eventually, all these connections become the child's mental representation of the meaning the form of the word
  - Connections can have different strengths; the strength of a connection is dependent on input frequency. e.g. *bottle—milk* vs *bottle—water*
- language acquisition involves adjusting the strengths of the connections appropriately
- Instead of exploiting abstract rules, children exploit statistical information from linguistic input
- The input children receive is indeed rich enough to learn language without an innate mechanism to invent linguistic rules

- e.g. Past tense rule
  - Children say *goed* and *growed* because the existence of forms like *showed, mowed, towed*, and *glowed* makes this pattern statistically likely
  - Experiment with nonsense word *fring*
  - Many children create nonsense irregular forms such as *frang* or *frought* instead of *fringed* → a problem with Active Construction theory
  - If children exploit statistical data, they would be expected to sometimes produce irregular forms because of their exposure to words like *sing, ring, bring* (analogy)

- A hybrid model
  - It is possible that children both develop rules and also make use of statistical data.
  - Children actively construct a grammar by establishing and exploiting neural connections.

Social Interaction Theory

- Children acquire language through social interaction, with older children and adults in particular.
- Children prompt their parents to supply them with the appropriate language experience they need.
- Children must develop rules and they have a predisposition to learn language; however, social interaction theorists place a great deal of emphasis on social interaction and the kind of input that children receive, instead of assuming that simply being exposed to language use will suffice.
- Problems
  - Child-directed speech (speech to infants) is slow and high-pitched, contains many repetitions, simplified syntax, exaggerated intonation, and a simple and concrete vocabulary. (5) vs (6)

(5) See the birdie? Look at the birdie! What a pretty birdie! (p 320)

(6) Has it come to your attention that one of our better-looking feathered friends is perched upon the windowsill?
(Berko Gleason and Bernstein Ratner 1998)

  - Children eventually do acquire the ability to utter and understand sentences like (6).
  - The characteristics of child-directed speech vary from culture to culture.
- Social interaction Theory is not incompatible with Active Construction or Connectionist Theories.
- "The Birth of a Word." http://www.ted.com/talks/deb_roy_the_birth_of_a_word

First-Language (L1) Acquisition: Sounds and Phonology

- Sound perception(Identifying sounds)
  - High Amplitude Sucking (HAS)
  - Conditioned Head-Turn Procedure (HT)
  - DeCasper and Spence (1986). HAS. Infants cant hear speech in the womb. Dr. Seuss
  - 4 mo. Can distinguish [a] and [i]
  - VOT (voice onset time) /b/ (20 ms) vs /p/ (40 ms)
    - 6 mo. -60 ms vs -20 ms; 12 mo./adults can't
    - Thai-speakers (babies/adults) can
  - Word boundary
    - intonational cues (stress): What a pretty birdie → What-a, pretty, birdie
    - Statistical cues: What a pretty birdie; The birdie is flying → birdie

➢ Sound production (Producing sounds)

- crying → cooing /j/ or /ĩ̃/
- learn to gain control over the muscles in speech organs and coordinate the execution of articulatory movements

Babbling

- Babbling is not a conscious process
- Babbling is not linked to immediate biological needs, for sheer pleasure
- Babbling occurs at more or less the same time in all children → biological maturation. Babbling occurs automatically when the relevant structure in the brain reach a critical level of development.
- Babbling resembles adult speech
  - Syllables: CV
  - Intonation patterns. Question?
- Two functions of babbling
  - Practice for later speech: practice the muscle coordination needed to produce language
  - Social reward: parents respond with smiles or speech or nonsense "babbling"; gives the child important experience with the social aspects and rewards of speech
- First babbling (4 to 6 mo.)
  - Producing sequence of vowels and consonants
  - Opening and closing movement of the jaw and manipulating other articulators
  - Jaw goes up: the (relatively big) tongue touches the palate → [j] or [ɲ̃]
  - the lower lip touches the upper lip → [b] and [m]
  - Jaw goes down → [a]
- Repeated/Canonical babbling (7 to 10 mo.)
  - [mamamama] (nasal ← babies breathe mostly through nose)
- Variegated babbling (10 to 12 mo.)
  - [bugabimo]

Phonological Acquisition

- 18 mo.
  - Learn and ask for the names of objects in their environment
  - Tremendous variability in pronunciation: [wawa], [wait], [wed]. [dæt]
- 15-21 mo.
  - Beging to break words into smaller number of simpler units (sounds) that can be used in different combinations to make up many other words
- CV-syllable structure is the preferred structure in young children's productions [ma], [pa] → consonant cluster [sp]. Final consonants are often omitted → [l] [r] difficult to distinguish from vowels, mastered last
- Deletion of some (unstressed) syllables

  (1) *banana* [__**nænə**] *granola* [___**owə**] *potato* [__**deɪdoʊ**]
  - Stress marks word boundary

Language
evelopment
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elve Months
eberg 1967,
p.327)

(2) Infants' language abilities, birth to twelve months

Approximate Age at Onset of Behavior	Vocalizations and Language
12 weeks	• Cries markedly less than at 8 weeks • Smiles when talked to and nodded at, followed by making squealing-gurgling sounds (cooing) • Sustains cooing for 15 to 20 seconds • Produces vaguely palatal sounds like [j] and [ɲ]
16 weeks	• Responds to human sounds more definitively • Turns head and eyes, seems to search for speaker • Occasionally makes some chuckling sounds • Distinguishes between vowels [i] and [ɑ] and the corresponding adult mouth producing these sounds
20 weeks	• Begins to intersperse vowel-like cooing sounds with more consonantal sounds
6 months	• Changes from cooing to babbling that resembles one-syllable utterances • Most commonly produces utterances that sound somewhat like [mɑ], [mu], [dɑ], or [di][1]
8 months	• Frequently uses continuous repetitions of the same syllable • Begins to have distinct intonation patterns • Begins using utterances to signal emphasis and emotions
10 months	• Mixes vocalizations with sound-play such as gurgling or bubble blowing • Appears to wish to imitate sounds, but the imitations are never quite successful
12 months	• Replicates identical sound sequences with higher relative frequency of occurrence; words (*mamma* or *dadda*) are emerging • Shows definite signs of understanding some words and simple commands (*Show me your eyes*)

[1]Notice that these sounds are often similar to the words for *mother* and *father* in many languages. While many parents think it is a sign of their child's developing genius that they learn to produce *mommy* and *daddy* as their first words, it is quite likely that the form of these words is simply taken from the first sounds a child can recognizably make!

(2) Infants' language abilities, eighteen months to four years

Approximate Age at Onset of Behavior	Vocalizations and Language
18 months	• Has definite repertoire of words—more than three, but fewer than fifty • Still engages in much babbling but now of several syllables, with intricate intonation pattern • Exhibits no frustration at not being understood • May include items such as *thank you* or *come here,* but has little ability to combine words into spontaneous two-item phrases • Progresses rapidly in understanding
24 months	• Has vocabulary of more than fifty items • Begins spontaneously joining vocabulary items into two-word phrases • Phrases appear to be own creations, not modeled on adult speech • Shows definite increase in communicative behavior and interest in language
30 months	• Shows fastest increase in vocabulary, with many new additions every day • No longer babbles • Becomes frustrated if not understood by adults • Produces utterances consisting of at least two words • Displays characteristic child grammar in sentences and phrases • Is generally not yet very intelligible (though there is great variation among children)
3 years	• Has vocabulary of about a thousand words • Produces utterances about 80% intelligible, even to strangers • Produces utterances with grammatical complexity comparable to that of colloquial adult language, although mistakes still occur
4 years	• Has well-established language • Tends to deviate from the adult norm more in style than in grammar

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Abilities from
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eberg 1967,
p.334)

First-Language (L1) Acquisition: Morphology, Syntax, and World Meaning

- The One-Word Stage (12 mo.)
  - Name people, objects, pets, and other familiar and important parts of his/her environment
  - *No, gimme, mine / all-gone, whasat?* ('what's that?')
  - Holophrastic stage (one-word sentence): naming, commenting, requesting, inquiring; using different intonations
- The Two-Word Stage (18 – 24 mo.)
  - The structure of utterances is determined by semantic relationships, rather than adult syntactic ones
  - Adopt a consistent set of word orders to convey semantic relations
  - Lack function words (prepositions, auxiliary verbs, determiners, inflectional affixes) →telegraphic. Economical!

(1)

agent + action	baby sleep	possessor + possession	Mommy book
action + object	kick ball	entity + attribute	block red
action + location	sit chair	demonstrative + entity	this shoe
entity + location	teddy bed	modifier + entity	more juice, 'nother cup

  - Deictics: here, there; Some use pronouns

- Later Stages of Development
  - More words (3,4,5, or more at a time). *Daddy eat cookie. Throw red ball.*
  - Syntactically organized
  - Function morphemes are acquired in a remarkably consistent order.
    - she walking (-ing) → she walked (-ed) → she walks (-s)
    - -s: shoes (plural) → mommy's (possessive) → walks (third-person present tense)
    - *in/on* (*-ing*/-s)
    - *a/the* (fairly early); *be* (pretty late)
  - Plurals: *-s* is one of the first morphemes along with *in, on, and –ing*
    - man → mans → manes/manses → men
    - nose/house/church → nose/house/church → noses/houses/churches
  - Negatives
    - *no* in front of a sentence: *no baby sleep, no I drink milk*
    - *no/not/can't/don't* between S and V: *baby no sleep, I no drink milk* (*can't/won't/don't* unanalyzed)
    - *I don't see something → I don't see nothing → I don't see anything*
  - Interrogatives
    - Rising intonation only: Mommy cup? More ride?
    - 3 yrs. *can, will*, and other auxiliary verbs in yes-no questions: *Are you sad? Why you are sad?*
- "Mistakes" are not random but reflect the system of grammar that children are in the process of constructing
- Children are not merely imitating the adult speakers around them

- The Acquisition of Word Meaning
  - Trial-and-error process
  - First words (1 yr) → 14,000 (6 yrs)
  - The order of words learned reflects the intrinsic complexity of the concepts involved
  - Children's initial meanings of words do not deviate randomly from those of adults, but rather they are related to and progress toward adult meanings in systematic ways.
  - Complexive concepts: when a child associates different characteristics with the meaning of a word on successive uses, thereby creating a set of objects that do not have any particular unifying characteristic
    - doggie: furry things (soft slippers, cats, fur coats) → things that move by themselves (birds, toads, toy cars)
    - Most basic; lasts for only a short period of time before over-/under-extensions
  - Overextensions (2 yrs): extends the range of a word's meaning beyond that typically used by adults; common properties (shape, size, color, taste)
    - fly: specs of dirt, dust, small insects, bread crumbs
    - moon: cakes, round marks, postmarks, O
    - Ticktock: clocks, watches, parking meters, a dial on a set of scales
    - Tries to make the most out of a limited vocabulary
  - Underextensions (school-aged children): application of a word to a smaller set of objects; less common
    - fruit (-olives); mammal (-whale)
    - Attempts to be as conservative as possible in their use of language

- Conceptually simpler → conceptually more complex
- Nouns → Verbs
- Proper names (6-9 mo.): *John, Daddy*
  - Associate a label with a single individual
- Relational terms (5-6 yrs): *large/small, dog vs elephant*
- Deictic expressions: personal/temporal/spatial aspects of an utterance whose meaning depends on the context
  - *here, this, there, that*
  - *this (30-story) building* vs *that ant* at the same distance
- Verbs
  - Identifying members of a set: *walk*
  - Same event: *give/take, buy/sell: Peter bought the car from Mike / Mike sold the car to Peter*
  - abstract: think, believe

How Adults Talk to Young Children

- Infant-directed speech or child-directed speech
- How adults get children to pay attention (attention getters and attention holders)
  - Names, exclamations (Look!)
  - Modulations: high-pitched voice
  - Whispering
  - Gestures, touches, pointing
- How necessary is child-directed speech?

What adults say to young children

- The "Here and Now"
  - Build me a tower now, That's right, pick up the blocks, That's a puppy, He's very soft and furry, The puppy's in the basket
  - Adults are very selective about the words they use

(1) Some words are easier for children to pronounce than others.

Some words are more useful for children than others.

Some words are hard to understand and best avoided.

- "Baby talk": *neow, woofwoof, kitty, doggie, mommy, daddy, wee-wee, night-night, peek-a-boo, choo-choo, uh-oh*
- Leave out function words
  - Avoid pronoun/repeat noun: Mommy's going to lift Tommy up (I'm going to lift you up)
  - Use names in question: Does Jenny want to play in the sand today?

- Taking Turns

(2) (File 8.4.3, p.337)

Ann: [smiles]

Mom: Oh, what a nice little smile! Yes, isn't that nice? There. There's a nice little smile.

Ann: [burps]

Mom: What a nice wind as well! Yes, that's better, isn't it? Yes.

Ann: [vocalizes]

Mom: Yes! There's a nice noise.

(3) Adult: Where's the ball?

[picks up ball] THERE'S the ball.

Adult: [looking at picture book with child]

What's the little boy doing?

He's CLIMBING up the TREE. (File 8.4.3, p.337)

On other occasions, adults expand on whatever topic the child introduces.

(4) Child: Dere rabbit.

Adult: The rabbit likes eating lettuce.

Do you want to give him some?

(5) Adult: What did you see?

Child: [silence]

Adult: You saw WHAT? (File 8.4.3, p.338)

- Making Corrections

(6) Child: [points] doggie.

Adult: No, that's a HORSE.

(7) Child: That's the animal farmhouse.

Adult: No, that's the LIGHTHOUSE.

(8) Child: [pointing to a picture of bird on nest] Bird house.

Adult: Yes, the bird's sitting on a NEST.

(9) Child: Robin goed to school yesterday.

Adult: No, Robin went to a BIRTHDAY PARTY yesterday.

How adults talk to children

(10)

Where's Let's play with Look at Here's That's (a) Here comes	+	Mommy Daddy (the) birdie … … etc.

(11) Adult: Pick up the red one. Find the red one. Not the GREEN one. I want the RED one. Can you find the red one?

Bilingual Language Acquisition

- Scenarios of Bilingual Language Acquisition
- Bilingual First-Language Acquisition
- Language mixing or code-switching

(1) *Sabes mi* school bus *no tiene un* stop sign.

"You know, my school bus does not have a stop sign."

Hoy ya era line leader *en mi escuela.*

"Today, I was line leader at school."

Ponemos cranberries *y* marshmallows *y despues se pone el* glitter *con* glue.

"Let's put cranberries and marshmallows and then we put the glitter on with glue."

- Bilingual vs. Monolingual First-Language Acquisition
- Second-Language Acquisition
  - Learner's native language: "transfer"
  - Motivation
  - Context/amount of exposure: immersion