- **Child language acquisition**
- **Acquisition of phonology**

Background reading:

- *CL* Ch 9, §1, "The study of language acquisition"
- *CL* Ch 9, §2, "Phonological development"

1. Main ideas: Child language acquisition

- Adults can speak and understand their native language(s) because they have a **lexicon** and **mental grammar** of that language:
  - **lexicon**

  - **mental grammar**

1. Main ideas: Child language acquisition

- **Adults** can speak and understand their native language(s) because they have a **lexicon** and **mental grammar** of that language:

  - **lexicon** — where sounds, meaning, and other unpredictable information are stored for each morpheme

  - **mental grammar** — rules and principles that handle systematic patterns, including phonology, morphology, and syntax

1. Main ideas: Child language acquisition

- **Adults** can speak and understand their native language(s) because they have a **lexicon** and **mental grammar** of that language

- How does a child acquiring a native language (first language; L1) get to this **target** adult state?
  - **lexicon**:

  - **mental grammar**:

1. Main ideas: Child language acquisition

- **Adults** can speak and understand their native language(s) because they have a **lexicon** and **mental grammar** of that language

- How does a child acquiring a native language (first language; L1) get to this **target** adult state?
    - **lexicon**: morpheme sound and meaning information must be learned and stored
    - **mental grammar**: How does this develop?

- Any (normally developing) infant has the potential to develop the mental grammar of any language

- Proposal:
  - Infants all start out with their mental grammar at the same (**universal**) original/default settings: "Universal Grammar"
  - When infants are exposed to language data, they will begin to develop the mental grammar needed to produce and comprehend a **particular** adult language (the **target** language)

**We can analyze each stage
of a child's developing mental grammar
with the same tools we use for adult languages**

2. L1 acquisition and mental grammar

- A child in the process of acquiring a language goes through different **stages** of development

  - These stages reflect **intermediate mental grammars** on the way to the adult grammar

- A child often shows **variable** behavior

  - A rule may be applied only some of the time

  - Multiple versions of a rule may be in use

- But we can still find a great deal of **systematicity** in children's language behavior

2. L1 acquisition and mental grammar

- "Learning" a native language is not the same as learning to do math or ride a bike
  - This is why the term **acquisition**, not "learning," is typically used for this process

- Children do not acquire language because their parents "teach" it to them
  - More about this in a later class

- Children acquire language through contact between
  - the **language data** in the environment
  - the (universal) acquisition mechanism of the **mental grammar**

2. L1 acquisition and mental grammar

- Studying the process of language acquisition can give us important insight into:

    - the nature of the mental grammar for a particular language

    - the range of the characteristics of **possible** human mental grammars: Are there 'mistakes' that children never make?

3. Phonological development

- **Distinguishing** different speech sounds
  - 6-8 months: Infants can distinguish among almost all of the sound categories used in the world's languages
  - 10-12 months: Infants have difficulty distinguishing sound categories that are **not contrastive** in their target language

- What does this change suggest about the child's mental grammar?

3. Phonological development

- 10-12 months: Infants have difficulty distinguishing sound categories that are **not contrastive** in their target language

- This developmental change is evidence for the beginning of a **language-specific phonological grammar**

  - They are developing an inventory of contrastive sounds (**phonemes**)

- **Babbling** — approximately 6 to 12 months
  - The most frequent consonants used in babbling are very consistent even for babies acquiring different target languages

Table 9.1 from *CL*, p 353 | What generalizations can we make?

Cross-linguistic similarities in babbling

Frequently found	Infrequently found
p b m t d n k g s h w j	f v θ ð ʃ ʒ ʧ ʤ l r ŋ

3. Phonological development

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Cross-linguistic similarities in babbling

Frequently found	*Infrequently found*
p b m t d n k g s h w j	f v θ ð ʃ ʒ ʧ ʤ l r ŋ

- Labials are common

- Oral and nasal stops are common

- Fricatives are rare, except [s, h]

- Liquids are rare but glides are common

3. Phonological development

- **Babbling** — approximately 6 to 12 months
  - The most frequent consonants used in babbling are very consistent across target languages
  - The most frequent consonants used are also frequent sounds in adult languages

- Does this tell us something about UG?
  (This question is controversial!)

3. Phonological development

- **Babbling** — approximately 6 to 12 months
  - The most frequent consonants used in babbling are very consistent across target languages
  - The most frequent consonants used are also frequent sounds in adult languages

- Does this tell us about UG? (Controversial!)
  - Maybe these consonants are typically early and common because **UG prefers them**
  - But maybe it is because of **articulation and perception** factors that do *not* depend on UG

3. Phonological development

- Individual children develop differently, but some **general patterns** can be observed:

  - Vowels develop before consonants

  - Stops are usually the earliest consonants

  - Labial is usually the first place of articulation (note: sighted children only!)

  - New phoneme categories are distinguished in word-initial position before other positions

- What factors might lead to these patterns?

3. Phonological development

- In many cases, children are able to **distinguish between phonemes they hear** even before they can produce them

  - How do we know this?

  - What are the implications for the child's **mental grammar**?

3. Phonological development

- In many cases, children are able to **distinguish between phonemes they hear** even before they can produce them

- We often find that **comprehension** is more adult-like than **production**
    - Example: A child pronounces both *mouse* and *mouth* as [maws], but can point to the correct pictures in a comprehension experiment

- What are the **implications** of this pattern?

3. Phonological development

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    - How is each of these morphemes represented in the child's **mental lexicon**?

        - 🐭   /maws/
        - 👄   /mawθ/

    - How can we explain the child's **pronunciation**?

        👄   [maws]

3. Phonological development

- If a child has an adult-like <u>phonemic</u> form, but produces a non-adult-like <u>phonetic</u> form...

  - Phonemic form: /mawθ/

  - Phonetic form: [maws]

3. Phonological development

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  - Phonemic form: /mawθ/

  - Phonetic form: [maws]

- The child's developing grammar must have a **phonological rule** that is not part of the adult grammar

3. Phonological development

- Writing child-specific phonological rules
  - Same as for adult phonological rules:
    - Rule format (A → B / X __ Y)
    - Use of **sound properties**

  - One difference: A child-specific rule may have **no environment** if a certain natural class changes into something else *everywhere*
    - Rule in such a case is only "A → B", no " / …"

- *Mouth* example: A rule for /mawθ/ → [maws] ?

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- *Mouth* example: voiceless interdental → alveolar

3. Phonological development

- Example from A, age 1;11

	(a)		(b)		(c)	
	cup	[t̠ʌp]	_goat_	[d̠owt]	_dog_	[dɔt̠]
	okay	[ot̠ej]	_Grampa_	[d̠æmpə]	_egg_	[ejt̠]
	fork	[fɔɹt̠]	_digger_	[dɪd̠ɹ]		

- What systematic patterns can we see here?

   (Hint: Think about **phonetic properties** and **natural classes**)

- What rule(s) should we propose for A at this stage?

3. Phonological development

- Example from A, age 1;11

(a)

		(b)		(c)	
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- What systematic patterns can we see here?

  - /k/ produced as [t] in all positions

  - /g/ produced as [d] in initial and medial positions
            and as [t] in final position

- General rule?

3. Phonological development

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  - /k/ produced as [t] in all positions

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    and as [t] in final position

- Generalize? Velar stops → alveolar

  Apparently also: Voiced stops → voiceless / _#

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3. Phonological development

- A **consistently** applied this rule until about age 2;6
    - Then 2 wks of **variable** [t]~[k] for /k/ (likewise /g/)

      Sometimes, A would visibly **correct** her first production: "[tʌp] ... [kʌp]"
    - After that, she settled on consistent [k] and [g]
    - Only one lexical item showed confusion about which phoneme it contained: *gear* [diɹ]

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- Just for fun: This actually happened, literally last week, when I misheard something A said about a bad smell (A is now 4;6)

  - "No, I didn't say *tar*, I said *car*! Not T-A-R. C-A-R."

4. Methods in acquisition research

- **Naturalistic** approach
  - Observe and record child language
  - Online data repository: <u>CHILDES</u>

- Advantages of the naturalistic approach

- Disadvantages

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- **Naturalistic** approach
  - Observe and record child language
  - Online data repository: <u>CHILDES</u>

- Advantages of the naturalistic approach
  - Data comparatively easy to collect
  - Shows language as it is used in context

- Disadvantages
  - Rare structures may not be collected
  - How can we tell what a child's mental grammar will <u>accept as grammatical</u>?

4. Methods in acquisition research

- **Experimental** approach
  - Explicitly test children's ability to produce, comprehend, or imitate language

- Advantages of this approach

- Disadvantages

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- **Experimental** approach
  - Explicitly test children's ability to produce, comprehend, or imitate language

- Advantages of this approach
  - Can study comprehension
  - Can investigate specific linguistic structures

- Disadvantages
  - Difficult to design good experiments for children
  - The relatively artificial context may affect aspects of children's language behavior

4. Methods in acquisition research

Examples of experimental methods used in child language research

- Video

  - [Infant Language Lab (1999)](#) — Johns Hopkins
    Video is old, but shows actual infants being tested

- Research lab web sites with photos & information about the methods they use

  - [Bergelson Lab](#) — Duke U

  - [BabyLab](#) — U Potsdam

  - [Penn Infant Language Center](#) — U Pennsylvania