Introduction to Language

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Lecture 7: Oct. 29 2013

Language Acquisition

First Language Acquisition

The process involved in learning your first language (L1) as a child.

- Not acquired through:
  - Imitation
  - Reinforcement (i.e., correction by caregivers)
- There is good evidence that children follow innate principles in language acquisition.

- What steps do children go through while acquiring their first language?
- How can they do it so quickly?

Language Acquisition

Second Language Acquisition

The process involved in learning any language (L2) after the acquisition of a first language.

- Could be later in childhood
- Could be in adulthood

- Why do adults have a much more difficult time learning a second language?
- What factors effect successful language learning?

Learned vs. Acquired

Learning

Learning involves conscious gaining of knowledge.

- How to draw a syntactic tree or tie a knot is learned knowledge.
- Second languages are by and large learned.

Acquisition

Acquisition involves subconscious gaining of knowledge.

- Your first language is acquired.

The Poverty of the Stimulus

The logical problem of language acquisition

- Language learners must come up with a grammar based on the input they receive.
- The input doesn't give learners enough information to work out all the properties of the language.
  - Input contains **ambiguous sentences and performance errors** (mispronunciations, false starts, interruptions).
  - Very little **negative evidence**. Children are very rarely overtly "corrected".
  - No one teaches you what the phonemes, allophones, and phonological processes of the language are.

Innateness Hypothesis

- Most linguists believe that **innate** universal principles guide children in the formation of grammar and constrain the types of grammars that create.
  - Innateness would account for why there are certain **types of errors that children never make**.
  - Innateness explains why first first language acquisition is **quick and mostly unconscious**.
  - Acquisition despite **poverty-of-the-stimulus**.
- The universal principles, common to all languages, are **Universal Grammar** (UG).

Children Have Grammars

Although the words and sentences produced by small children sometimes appear to be without any structure, children have highly structured **grammars**.

- ‣ In learning the adult language **children create their own grammar** which slowly evolves into the adult grammar.

- ‣ Both the phonological, morphological, and syntactic "**errors**" produced by children are **highly predictable**, suggesting constraints.

This is true of all languages and all normally developing children.

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Phonological Acquisition

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First Year of Speech Production/Perception

Before being able to acquire a language, children need to have developed two types of learning.

Types of Learning

- ‣ Before birth, children have the ability to process **sensory information**.
  - Hearing, seeing, smelling, etc.
- ‣ At birth, children begin to acquire **motor skills**.
  - By 3 months they begin to acquire the fine-motor skills used in speech articulation.

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First Year of Speech Perception

Early Speech Perception

- ‣ Newborns have the incredible ability to **discriminate** phonetic sounds from **all the worlds languages**.
  - i.e., Newborns can perceive whether two sounds of any language are the same or different.
  - **Upshot:** All normally developing humans are born with the ability to acquire **any** human language

Babies are incredible phoneticians and "citizens of the world".

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First Year of Speech Perception

Habituation-Switch Task

- ‣ Babies listen to a sequence of sounds (e.g., [pɑ], [pɑ], [pɑ], ...) until they turn their head away for more than 2 seconds.
- ‣ A flashing light redirects their attention for a few trails
- ‣ In the experimental trail, a new sound [pʰɑ] is played instead.
- ‣ If the baby reacts to the new sound, we can assume they hear the difference.

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First Year of Speech Perception

What do these experiments show?

- ‣ Children under 6 months have the ability to discriminate sounds.
- ‣ By 6 months, children home in on the particular language they are learning.
- ‣ Keeping statistics about the sounds they hear.
  - Can no longer distinguish between sounds not found in their language.
  - They are beginning to build a **phonemic inventory**.

Patricia Kuhl talk

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First Year of Speech Perception

- ‣ After 6 months infants:
  - Can perceive the phonemes of their language
  - Can recognize some words, including their own name.
- ‣ By 9 months
  - Can recognize phonological processes in their language.
  - Can perceive words as units

First Year of Speech Production

Three pre-language stages of production:
- ‣ Crying. (From birth)
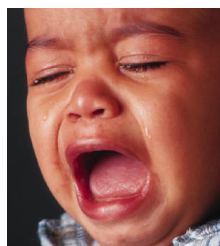- ‣ Cooing. (2 months)
- ‣ Babbling. (6 months)

First Year of Speech Production

Crying

The first pre-language communication strategy that all babies use is **crying**.

- ‣ Communicates discomfort or hunger
- ‣ To cry effectively, babies need to have control of three ingredients to language:
  - Control of speech rhythm (stopping and starting).
  - Control of pitch.
  - Control of volume.

First Year of Speech Production

Cooing

By 2 months, children are at the **cooing** stage in which they experiment with making consonant-like and vowel-like sounds.

- ‣ Not actual sounds of the target language (the language being learned).
- ‣ At this stage, infants are acquiring **turn-taking**, gesturing, and interactional cues.
  - Learning how to have a conversation. (VIDEO)

First Year of Speech Production

Babbling

At about 6 months, infants are **babbling**.

- ‣ Zeroing in on their target language and the sounds that they use are closer and closer to the sounds of the target language.
- ‣ Repeat the same syllables over and over.
- ‣ By 10 months, children are only producing the sounds of their target language. (VIDEO)
  - A limited **phonemic inventory**.
- ‣ By 12 months, children begin to produce individual words in their own language.

Babbling in ASL

- ‣ Experimenting with different handshapes.

Order of phonological development

A child learning any language typically acquires phonemes of a language in particular orders.

- ‣ vowels < consonants
- ‣ stops < fricatives < affricates < approximants
- ‣ labials < alveolars, palatals, velars < interdentals

The more **marked** sounds are acquired last:

- ‣ More difficult to produce.
- ‣ Restricted to certain environments.
- ‣ Less common cross-linguistically.

Order of phonological development

Typical English consonant inventory at age two

Stops			Fricatives	Approximants
p	b	m	f	w
t	d	n	s	
k	g			

Typical English consonant inventory at age four

Stops			Fricatives		Affricates		Approximants	
p	b	m	f	v			w	
t	d	n	s	z			l	ɹ
			ʃ		ʧ	ʤ	j	
k	g	ŋ						

Still missing [θ, ð, ʒ, h, ʔ]

Phonological Strategies

Once children are producing words, they use a number of **strategies to adapt words and sounds to their current grammars** until they can further **refine** their system to be like an adult system.

‣ Substitution
‣ Assimilation
‣ Syllable structure simplification

Phonological Strategies

Substitutions: Stopping

Example	Change
sing → [tɪŋ]	[s] → [t]
sea → [ti]	[s] → [t]
zebra → [dibɹə]	[z] → [d]
thing → [tɪŋ]	[θ] → [t]
this → [dɪt]	[ð] → [d], [s] → [t]
shoes → [tud]	[ʃ] → [t], [s] → [t]

Fricatives are realized as stops

Phonological Strategies

Substitutions: Fronting

Example	Change
ship → [sɪp]	[ʃ] → [s]
jump → [dzʌmp]	[ʤ] → [dz]
chalk → [tsɑk]	[ʧ] → [ts]
go → [do]	[g] → [d]

Sounds produced further back in the oral tract are articulated further front.

Phonological Strategies

Substitutions: Gliding

Example	Change
lion → [jajən]	[l] → [j]
laughing → [jæfɪŋ]	[l] → [j]
look → [wʊk]	[l] → [w]
rock → [wɑk]	[ɹ] → [w]
sto**r**y → [stowi]	[ɹ] → [w]

Liquids are often realized as glides. Typically a late development. (I did this until I was about 7.)

Phonological Strategies

Substitutions: Denasalization

Example	Change
spoo**n** → [bud]	[n] → [d]
ja**m** → [dæb]	[m] → [b]
roo**m** → [wub]	[m] → [b]

Nasal sounds are realized as their oral equivalents.

Phonological Strategies

Assimilation: Voicing

Example	Change
tell → [dɛl]	[t] → [d]
pig → [bɪg]	[p] → [b]
push → [bʊs]	[p] → [b]
soup → [zup]	[s] → [z]

The first sound of all these words have assimilated to the voicing of the following vowel.

Phonological Strategies

Assimilation: Place

Example	Change
doggy → [gɑgi]	[d] → [g]
self → [fɛlf]	[s] → [f]

The first sound of all these words have assimilated the place of articulation of a consonant later in the word.

Can have other kinds of assimilation as well (manner, nasal etc.).

Phonological Strategies

Syllable Structure Simplification

Children simplify syllable structures in specific ways:

- ‣ Delete certain unstressed syllables
- ‣ Simplify consonants clusters
- ‣ Delete codas
- ‣ Reduplication

Phonological Strategies

Syllable Simplification: Deletion of Unstressed Syllables

Example		Change
hip po '**po** ta mus	→	[pɑs]
spa '**ghe** ti	→	[gɛ]
'**he** li ˌcop ter	→	[ɛlkɑt]
kan ga '**roo**	→	[wu]
'**te** le ˌ**phone**	→	[fow]

Unstressed syllables are often deleted in early child production.

Phonological Strategies

Syllable Simplification: Retention of Word Final Unstressed Syllables

Example		Change
po 'ta to	→	[tedo]
ba 'na na	→	[ænə]
to 'ma to	→	[medo]
'e le phant	→	[ɛlfən]

Unstressed syllables are retained are usually word final.

Phonological Strategies

Syllable Simplification: Consonant Cluster Simplification

Type	Example	Change	
[s] + stop, delete [s]	stop	→	[tɑp]
	small	→	[mɑ]
	desk	→	[dɛk]
[s] + liquid, delete liquid	try	→	[taj]
	crumb	→	[gʌm]
	bring	→	[bɪŋ]
fricative + liquid, delete liquid	from	→	[fʌm]
	sleep	→	[sip]
nasal + voiceless stop, delete nasal	bump	→	[bʌp]
	tent	→	[dɛt]

Phonological Strategies

Syllable Simplification: Coda Deletion

Example		Change
dog	→	[dɑ]
bus	→	[bʌ]
boot	→	[bu]

Syllable Simplification: Reduplication

Example		Change
water	→	[wɑwɑ]
mother	→	[mɑmɑ]

Phonological Strategies

Counting to ten

	Realization	Process(es)
1	[wʌ]	Coda Deletion
2	[du]	Voicing assimilation
3	[bi]	Cluster Simplification, Stopping, Fronting
4	[bo]	Coda Deletion, Stopping, Voicing assimilation
5	[baj]	Coda Deletion, Stopping, Voicing assimilation
6	[zi]	Coda Deletion, Voicing assimilation
7	[zɛm]	Unstressed syllable deletion, Voicing assimilation
8	[e]	Coda Deletion
9	[naj]	Coda Deletion
10	[dɛ]	Coda Deletion, Voicing assimilation

Deb Roy talk

Morphological acquisition

Vocabulary Development

Children's first words include lexical items and fixed expressions

Entities
- people: *daddy, mommy, baby*
- food: *juice, mil, cookie, water, apple*
- animals: *dog, cat, duck*
- clothes: *shoes, hat*
- toys: *ball, blocks*
- vehicles: *car, truck*
- other: *bottle, book*

Properties
- *hot, allgone, more, dirty, cold*

Actions
- *up, sit, see, eat, go, down*

Personal-social expressions
- *hi, bye, no, yes, please, thank you*

Word Meaning

Children frequently either over-extend or under-extend the meaning of words:
- **Overextension**: When the meaning in the child's grammar is more general than the meaning in the adult grammar.
  - e.g., using "ball" to refer to all round objects, like apples
- **Underextension**: when the meaning in the child's grammar is more specific than the meaning in the adult grammar.
  - e.g., using "dog" to only refer to German Shepherds but not other types of dogs.

Word Meaning

Examples of Overextension

Word	First referent	Subsequent extensions
tick tock	watch	gas-meter, scale with round dial
quack	duck	all birds and insects
candy	candy	anything sweet
apple	apple	balls, tomatoes, cherries, onions
cookie	cookie	crackers, desserts
kitty	cat	rabbits, mice, small animals
daddy	father	all men

Word Meaning

Many linguists believe that this is actually rarer than it could be because children have particular learning **biases** that push them in prefer certain types of meanings.

- **Whole-object bias**: Expect that the first word that you hear as a name applies to the whole object, not a part.
- **Taxonomic bias**: Assume that a new word applies to other objects of the same kind, not just the salient object in the context.
- **Mutual exclusivity bias**: Assume that an object has only one name.

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Acquistion of Functional Morphemes

Children acquiring English follow a predictable path of acquisition of the functional morphemes of English:

1. present progressive *-ing*
2. preposition *in*
3. preposition *on*
4. plural *-s*
5. irregular past tenses *came, went*
6. possessive *-s*
7. copular *is*
8. articles *the, a*
9. regular past tense *-ed*
10. 3rd sg. regular agreement *-s*
11. 3rd sg. irregular agreement *has*
12. auxiliaries *was/did*
13. contracted copula *-s*
14. contracted auxiliary *-s*

Two factors determine this order of acquisition:

- **Semantic Complexity**
- **Formal Complexity**

This list is specific to English, but the order of acquisition of morphemes in all languages depends on semantic and formal complexity.

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Emergence of Morpho-phonological Rules

The **past tense** offers evidence that children create morpho-phonological rules as they acquire language.

- At first, children acquire individual instances of past tense forms (e.g., walked, went) with no morphological break down.
- Soon, they learn the morpho-phonological rule "add /-d/ to the end of the verb".
- However, they over-apply this rule, not just to regular verbs, but also irregular verbs, and we get forms such as *goed*, *taked*, *doed*.
- Eventually, they relearn the irregular forms (*went, took, did*)

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Emergence of Morpho-phonological Rules

We see the same pattern of acquisition of all irregular morphology in all languages:

- **Stage 1**: case-by-case learning.
- **Stage 2**: overgeneralization.
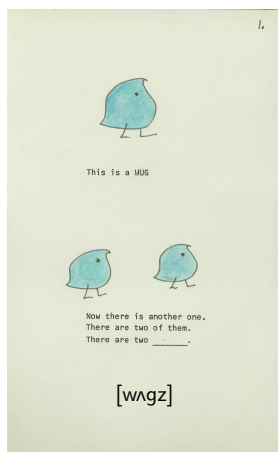- **Stage 3**: mastery of exceptions.

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Emergence of Morpho-phonological Rules

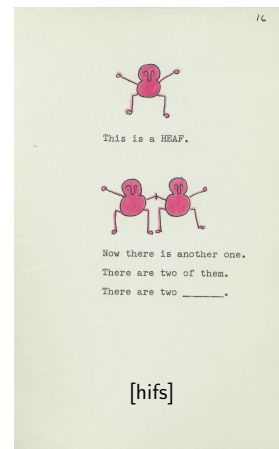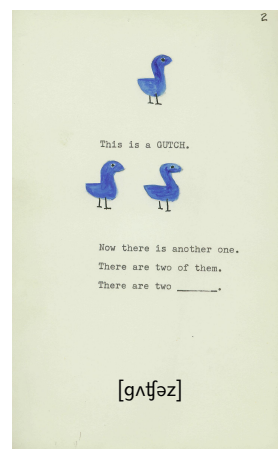Best evidence for this last stage is children's ability to apply rules to words they've never heard before.

One of the most famous experiments in linguistics is the **Wug Test**

- Children are shown pictures of unknown animals, actions, or objects with made-up names and are asked to produce the plural form (or the past tense, etc.).

This is a WUG

Now there is another one.
There are two of them.
There are two _____.

[wʌgz]

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Emergence of Morpho-phonological Rules

This is a GUTCH.

Now there is another one.
There are two of them.
There are two _____.

[gʌtʃəz]

This is a HEAF.

Now there is another one.
There are two of them.
There are two _____.

[hifs]

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Emergence of Morpho-phonological Rules

This is a man who knows how to GLING.
He is GLINGING. He did the same thing
yesterday. What did he do yesterday?
Yesterday he _____.

This is a man who knows how to RICK.
He is Ricking. He did the same thing
yesterday. What did he do yesterday?
Yesterday he _____.

This is a man who knows how to MOT.
He is MOTTING. He did the same thing
yesterday. What did he do yesterday?
Yesterday he _____.

[glɪŋd]   [ɹɪkt]   [mɑtəd]

Emergence of Morpho-phonological Rules

Since children have never heard these words before, they cannot simply be imitating.

- Instead, they're applying the rules they've acquired unconsciously through being exposed to language!
- By ages four to five, children have mastered the morpho-phonological processes of their language.

Syntactic Acquisition

Early Stages of Syntactic Acquisition

Children's syntax becomes increasingly complex

- **Holophrastic (one-word) Stage** (1-1.5 years)
  - Children only produce one-word utterances.
  - No evidence of phrase structure.
- **Two-word Stage** (1.5-2 years)
  - Still little evidence of phrase structure, but the beginnings of a syntactic grammar.
- **Telegraphic Stage** (2-2.5 years)
  - Similar to adult speech, but lacking functional morphemes (articles, auxiliaries, inflection, etc.)
  - Appears to follow phrase structure rules.

Early Stages of Syntactic Acquisition

Holophrastic Stage

Child's Utterance	Semantic Relation	Situation
dada	agent of action	as father enters room
down	action or state	as child sits down
door	theme	as father closes the door
here	location	as child points
mama	recipient	as child gives mother something
again	recurrence	as child watches light of a match

At this stage, children are able to manipulate intonation to express questions, commands, statements.

Early Stages of Syntactic Acquisition

Two-word Stage

Child's Utterance	Semantic Relation	Intended meaning
baby chair	agent - location	'The baby is in the chair'
doggie bark	agent - action	'The dog is barking'
Mama water	agent - theme	'Mom is drinking water'
Hit doggie	action - theme	'I hit the doggie'
Daddy hat	possessor - possessed	'Daddy's hat'

Two word proto-sentences with **correct** word order!

Early Stages of Syntactic Acquisition

Telegraphic Stage

Children's utterances begin to be more adult-like.

- Still lack functional morphemes but word order is right.
  - Daddy like book.
  - What her name?
  - Man ride bus today.
  - Me wanna show Mommy.

Later Developments

- Question formation through inversion of subject and verb (e.g. *Will you go?*)
- WH-questions (e.g., *Where are you going?*).
- Passive sentences (e.g., *The baby was tickled*).
- Relative clauses (e.g., *The owl who eats candy runs fast*).

Evidence For UG

Many linguists believe that underlying the process of syntactic acquisition is an innate Universal Grammar.

- Good evidence comes from the kinds of errors that children **never** make!
  - The big dog is here. → Is the big dog here?
  - → *Big is the dog here?
  - → *The is big dog here?
  - → *The big is dog here?
- Because children never make these errors, it must mean that they are biased in someway toward a **hierarchical** structure.
  - If there were **no hierarchical UG**, we would expect children to experiment with **flat/linear** syntactic structures, but they never do!

Second Language Acquisition

Critical Period Hypothesis

Given the relative ease with which children acquire their first language, the high accuracy of their acquisition, and the uniformity of acquisition, it is hypothesized that childhood constitutes a critical period for language development.

The Critical Period Hypothesis

There is a window of time for language acquisition after which native-like proficiency is rarely achieved.

- Furthermore, normal linguistic development requires exposure to language during the critical period.

Critical Period Hypothesis

Individuals who don't experience language as children never fully acquire language.

Genie is the pseudonym of a child who was abused and kept in a small room with no opportunity to hear human speech from between the ages of two and thirteen.

- After years of therapy and care, Genie's non-linguistic cognitive functioning was described as 'relatively normal' and her lexical and semantic abilities were 'good' but in terms of syntax and morphology, she had many problems.

Utterance	Meaning
Applesause buy store	'Buy applesauce at the store.'
Man motorcycle have	'The man has a motorcycle.'
Want go ride Miss F. car	'I want to go for a ride in Miss F.'s car.'
Mama have baby grow up	'Mama has a baby who grew up.'

Not an isolated case.

Factors Affecting L2 Acquisition

- Age
- Attitude
- Motivation
- Cognitive Style
- Personality

Factors Affecting L2 Acquisition

Age
- Research shows that the **ultimate attainment** (i.e., the final state of acquisition) of a pre-puberty second language learner is closer to that of native speakers than that of post-puberty second language learners.
- This is **particularly true of phonetics/phonology**, as acquiring new phonological contrasts (i.e., phonemes) becomes difficult after childhood.
- Someone speaking an L2 with their L1 phonology results in a "foreign accent".
  - Many ESL speakers achieve syntactic/morphological fluency but retain an L2 accent.

Factors Affecting L2 Acquisition

Attitude
- **Attitude** can also affect success in second language acquisition.
- Attitude can include:
  - Attitudes toward the L2 language.
  - Attitudes towards speakers of the language.
  - Attitudes towards language-learning in general.

Factors Affecting L2 Acquisition

Motivation
- **Motivation** affects the success and the level of ultimate attainment.
- There are different types of motivation:
  - **Intrinsic motivation**: driven by inner goals (e.g., personal achievement, curiosity).
  - **Extrinsic motivation**: driven by external goals (e.g., job opportunities, grades).

Factors Affecting L2 Acquisition

Cognitive Style
- **Cognitive styles** are the different ways in which different people process information
  - Someone with **field independent** cognitive style tends to approach problems analytically, examining details and specifics.
    - Better at analytic language tasks, such as "provide the correct grammatical form ..."
    - Accuracy is important.
  - Someone with **field dependent** cognitive style tends to approach problems holistically (i.e., focusing on the whole instead of sub-parts).
    - Better at demonstrating communicative competence.
    - Fluency is important.
- Some people also just have a natural ability to learn languages.

Factors Affecting L2 Acquisition

Personality
- Lack of inhibition, extroversion, and even gregariousness, for instance, may lead to more participation in the second language and result in greater proficiency.

What is the L2 learner doing?

Beyond memorizing new words and learning to distinguish between new sounds, an L2 learner is creating **a new grammar based on the L2**.
- Since this grammar is different from both the L1 and the L2 (especially at early levels), it is called an **interlanguage** — containing features of both the L1 and L2

The use of features from the L1 in the interlanguage is called **transfer**.
- **Positive transfer**: the correct use of L1 structures in the L2 (due to similarities between languages)
- **Negative transfer**: the incorrect use of L1 structures that are different in the L2 (due to differences)

Interlanguage Phonology

L2 learners who haven't acquired a particular L2 phoneme substitute phonologically similar phonemes from their L1.

- ‣ L1 Quebec French, L2 English speakers often substitute [d] for [ð] (not in French)
  - • Both are voiced and have same place ([d] is dental in French.)
- ‣ L1 German, L2 English speakers use [z] for [ð]
  - • Both voiced fricatives, close with respect to place.
- ‣ L1 English, L2 Japanese speakers use [ɹ] for [r].
  - • arigatou [arigatoː] → [ɛɹəgato]
- ‣ L1 Japanese, L2 English speakers use [r] for [ɹ] and [l].
  - • dollar-rama [dɑləɹamə] → [dɑrirama].

Interlanguage Syllabification

Different languages have different rules for syllabification.

- ‣ English has complex syllables, but this is not allowed in all languages
- ‣ Japanese for instance only allows one consonant in an onset.
  - • This leads to L1 Japanese, L2 English speakers having modified syllabic structures for words:
  - • ice cream [ajs.kɹim] → [aj.sɯ.kə.ri.mɯ]
- ‣ The **epenthetic vowel** differs across languages.
  - • Arabic L1 English L2 speakers usually insert [i]: *plant* → [pi.læn.ti].

Interlanguage Morphology

Functional morphemes are acquired by L2 learners in roughly the same order as L1 learners.

- ‣ A function of semantic and formal complexity

L2 speakers also often **omit** functional morphemes such as **articles, plural marker, past tense marker** much like children do during the telegraphic stage.

Also depends on the L1.

- ‣ Speakers are delayed in learning inflectional affixes if their L1 lacks inflectional affixes.
  - • Japanese and Korean L1 learning English, 3rd person singular -*s* affix is difficult.

Interlanguage Syntax

As you might expect, structures in the L2 that are similar in the L1 are more easily learned. Structures that are more dissimilar are acquired later.

Language Myth 3

Some languages are harder to learn than other languages.

- ‣ All human languages are equally easy for children to acquire.
  - • Children will acquire whatever language is in their environment.
  - • Sometimes multiple languages (Korean speaking father, German speaking mother, French speaking nanny).
- ‣ English speaker learning German have a slight advantage over those learning Finnish.
  - • German and English are closely related and share a lot of vocabulary, sounds, and structures while Finnish has a different vocabulary, sounds, and structures.
- ‣ An Estonian L1 speaker would find Finnish easier to learn than German because Estonian and Finnish are closely related and have many similarities.

What makes a language easy or hard to learn is not a property of the language itself but of the learners previous linguistic experience.

For Next Week...

1. Read chapter 13 if you haven't yet and chapter 10.