LSci 51/CogS 56L: Acquisition of Language

Lecture 1

Introduction

Administrivia

Instructor:

Professor Niels Dickson, Department of Language Science

nielsd@uci.edu

http://www.socsci.uci.edu/~lpearl

Office Hours: 10am Wednesdays over Zoom

(see Canvas for office hours Zoom link)

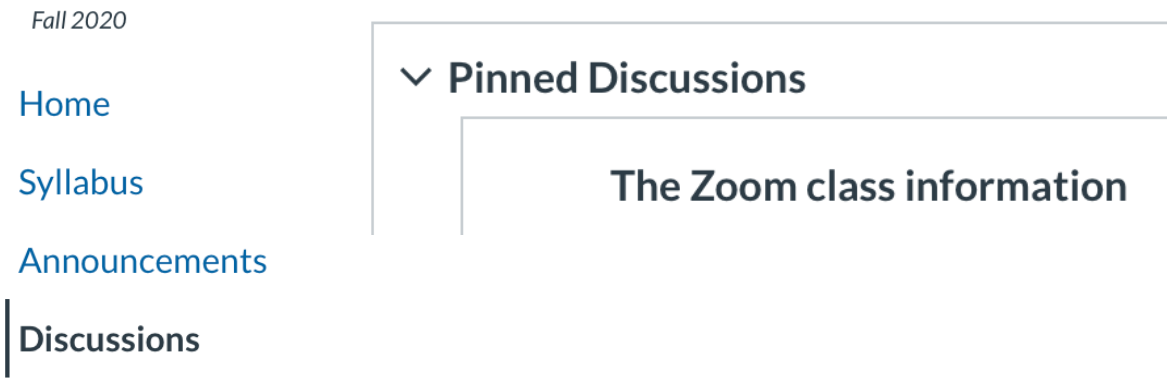
Administrivia

Discussion board (accessible via the website and Canvas)

https://ucirvine.instructure.com/courses/75243/discussion_topics

Used to facilitate communication about the course administrivia and content. Also has Zoom links for live class sessions and office hours.

Please go there first to see if someone has already asked your question before emailing the TAs or professor. It may be that your question is already answered there, and this will allow you to get a quicker response to your question.

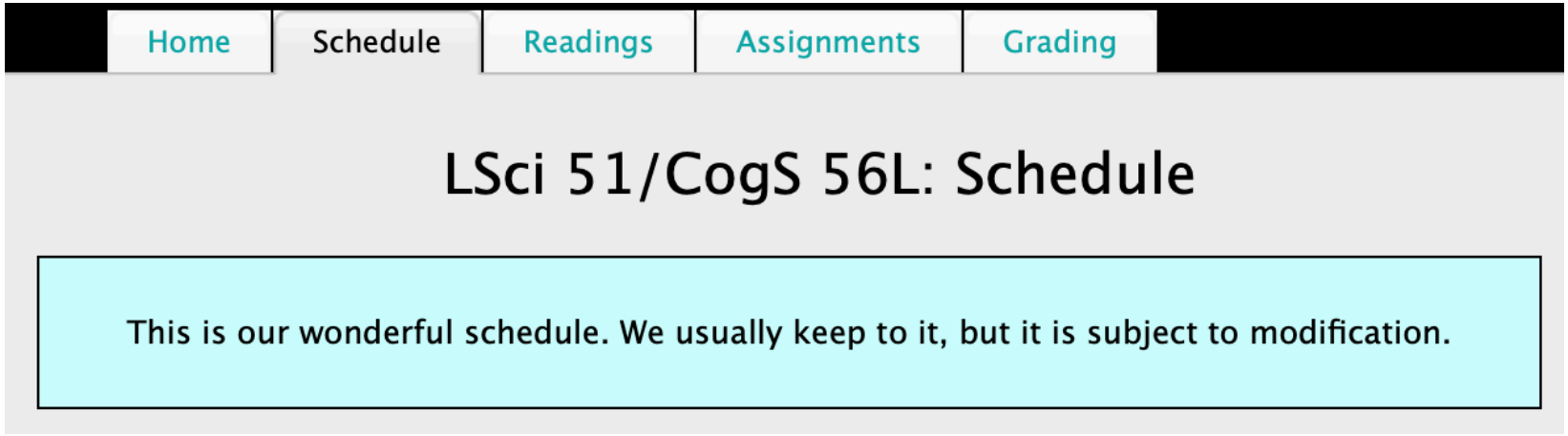


Administrivia

Class web page:

https://nielswd23.github.io/LSCI51Summer25/

Accessible from Canvas, as well. Contains overview, schedule, readings, course assignment descriptions, and grading policies.



Administrivia

Reference readings will primarily be from book excerpts, articles, and video links — they can be found on the schedule page for each session's content

Date	Topic	Notices & Assignments	Reference Material

Administrivia

Assignments

Homework:

Several throughout the quarter, available through Canvas as untimed “Quizzes”. Collaboration is allowed and **highly encouraged**. I encourage you to **form homework/study groups**.

However, you must turn in your own copy of the assignment.

Administrivia

Assignments

Homework:

Several throughout the quarter, available through Canvas as untimed “Quizzes”. Collaboration is allowed and **highly encouraged**. I encourage you to **form homework/study groups**.

Please note that **working together (that is, collaborating) is different than copying someone else's answers. If someone pressures you to let them copy your answers, this is academic dishonesty on their part**.

You shouldn’t feel ashamed or guilty about saying no to them -- after all, why should they get credit for your hard work and effort? Instead, they should be ashamed for even asking you in the first place.

Please report any academic dishonesty incidents to Niels, and appropriate action will be taken.

Administrivia

Assignments

Homework:

Several throughout the quarter, available through Canvas as untimed “Quizzes”. Collaboration is allowed and **highly encouraged**. I encourage you to **form homework/study groups**.

Note: You’re allowed to use AI to help you answer the homework questions. However, you’re responsible for the answer you submit. So, it’s up to you to make sure you check any content you get from an AI tool.

Administrivia

General AI policy

You're welcome to use AI in this class (e.g., ChatGPT, anything else that crosses your path that seems useful, etc). Learning to use AI is an emerging skill that can help you improve your workflow if you can figure out how to use it effectively. To use AI effectively, you need to be aware of the limits of these systems.

In particular, AI is a tool, just like a pencil or a computer. AI can be a valuable tool for drafting content and fine-tuning content that's already been produced, but it definitely isn't a replacement for critical thinking and decision-making.

Administrivia

General AI policy

You're welcome to use AI in this class (e.g., ChatGPT, anything else that crosses your path that seems useful, etc). Learning to use AI is an emerging skill that can help you improve your workflow if you can figure out how to use it effectively. To use AI effectively, you need to be aware of the limits of these software systems.

Use your best judgment to determine if/where/when to use this tool. It doesn't always make your life easier and/or better (but sometimes it really does).

Detour: AI in Education

Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Task△

Nataliya Kosmyna [1]
MIT Media Lab
Cambridge, MA

Eugene Hauptmann
MIT
Cambridge, MA

Ye Tong Yuan
Wellesley College
Wellesley, MA

Jessica Situ
MIT
Cambridge, MA

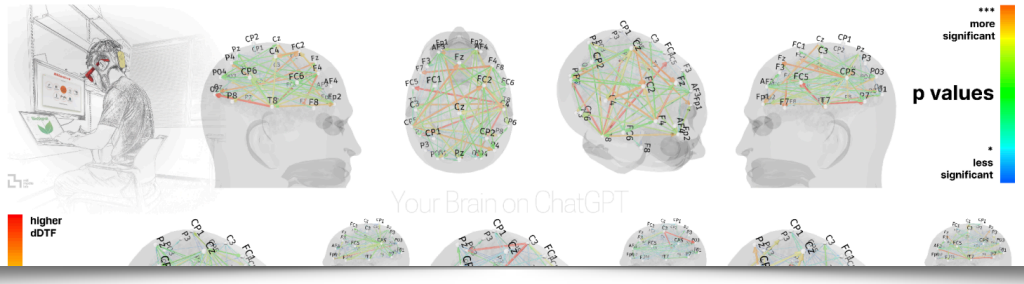
Xian-Hao Liao
Mass. College of Art and Design (MassArt)
Boston, MA

Ashly Vivian Beresnitzky
MIT
Cambridge, MA

Iris Braunstein
MIT
Cambridge, MA

Pattie Maes
MIT Media Lab
Cambridge, MA

United States



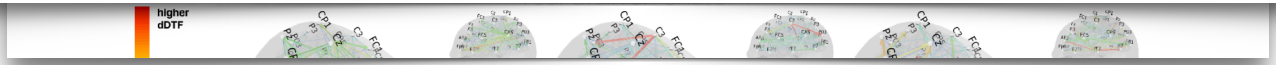
Detour: AI in Education

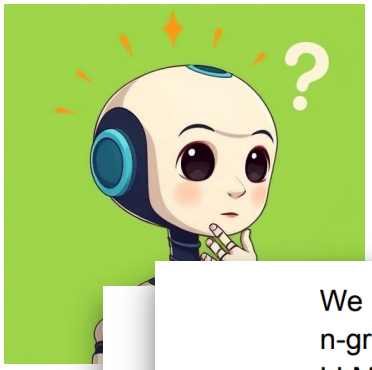
Abstract

With today's wide adoption of LLM products like ChatGPT from OpenAI, humans and businesses engage and use LLMs on a daily basis. Like any other tool, it carries its own set of advantages and limitations. This study focuses on finding out the cognitive cost of using an LLM in the educational context of writing an essay.

We assigned participants to three groups: LLM group, Search Engine group, Brain-only group, where each participant used a designated tool (or no tool in the latter) to write an essay. We conducted 3 sessions with the same group assignment for each participant. In the 4th session we asked LLM group participants to use no tools (we refer to them as LLM-to-Brain), and the Brain-only group participants were asked to use LLM (Brain-to-LLM). We recruited a total of 54 participants for Sessions 1, 2, 3, and 18 participants among them completed session 4.

We used electroencephalography (EEG) to record participants' brain activity in order to assess their cognitive engagement and cognitive load, and to gain a deeper understanding of neural activations during the essay writing task. We performed NLP analysis, and we interviewed each participant after each session. We performed scoring with the help from the human teachers and an AI judge (a specially built AI agent).



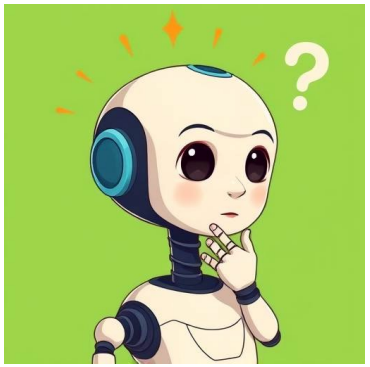


Detour: AI in Education

We discovered a consistent homogeneity across the Named Entities Recognition (NERs), n-grams, ontology of topics within each group. EEG analysis presented robust evidence that LLM, Search Engine and Brain-only groups had significantly different neural connectivity patterns, reflecting divergent cognitive strategies. Brain connectivity systematically scaled down with the amount of external support: the Brain-only group exhibited the strongest, widest-ranging networks, Search Engine group showed intermediate engagement, and LLM assistance elicited the weakest overall coupling. In session 4, LLM-to-Brain participants showed weaker neural connectivity and under-engagement of alpha and beta networks; and the Brain-to-LLM participants demonstrated higher memory recall, and re-engagement of widespread occipito-parietal and prefrontal nodes, likely supporting the visual processing, similar to the one frequently perceived in the Search Engine group. The reported ownership of LLM group's essays in the interviews was low. The Search Engine group had strong ownership, but lesser than the Brain-only group. The LLM group also fell behind in their ability to quote from the essays they wrote just minutes prior.

As the educational impact of LLM use only begins to settle with the general population, in this study we demonstrate the pressing matter of a likely decrease in learning skills based on the results of our study. The use of LLM had a measurable impact on participants, and while the benefits were initially apparent, as we demonstrated over the course of 4 months, the LLM group's participants performed worse than their counterparts in the Brain-only group at all levels: neural, linguistic, scoring.

We hope this study serves as a preliminary guide to understanding the cognitive and practical impacts of AI on learning environments.



Detour: AI in Education

Quick survey: https://forms.gle/rvLs6V43ZC61eS8k8

Administrivia

Assignments

Homework:

Late homework will be accepted according to the late policy listed in the assignments section on the class webpage. If you can't turn in the homework on time, take advantage of the policy to get some credit for your assignment. Seriously.

Late policy: Late assignments will be accepted, but will lose 5% of the total score possible on the assignment for **every day** late. This is to encourage you to do the assignments, as it is far preferable to work through the material late rather than never. Moreover, homework comprises a significant portion of your grade, so please do it – even if it's late. Late assignments can be submitted through the normal Canvas interface.

If you submit a late assignment, please email both the professor and the TAs so that your assignment will be appropriately graded.

Administrivia

Assignments

Review questions are also available for each topic, but you are not required to do them. They're just there to help you review the material (and are a great way to focus your attention for the timed assessments).

9/26/25	**Introduction to Language Acquisition I** (pdf) (recorded session)	Review questions available for intro **HW1** available

Administrivia

Assignments

Commenting on class material

Discussing material from class is one way to engage with it more productively. We'll use interactive commenting where you can respond to other people's comments and engage in a discussion over the content.

Note: Even just seeing other people's comments on content you also had thoughts about can help refine your own understanding of that content.

Administrivia

Assignments

Commenting on class material

We'll currently be using Canvas Discussions for commenting on course material. You will post a question for each section of the course. Can be a question you had from the lecture, a homework question, a review question, etc. Then you will respond to two other questions where you try to answer it. You must **cite course material**. We'll use these comments to guide our in-class discussion for each review session, so you can only receive full credit if you comment by the review session start.

Late interactive commenting will be accepted for partial credit, 10% penalty for every day late.

Administrivia

Attendance

Attendance

Attending lectures will account for 10% of your grade. This is to encourage synchronous participation.

There will be 16 class sessions, and to receive full attendance credit you have to attend 14 (i.e. you can miss two without any penalty). If you know you'll have to miss a lecture, email me. Lectures will be recorded if you are unable to attend synchronously.

Attendance will be recorded from the zoom reports, so join the sessions with your UCI zoom account.

Administrivia

Timed Assessments

There will be a timed assessment after almost every major topic covered (though the last one combines two topics because they're short). These assessments are *not* cumulative, and include only material from that topic, typically 3-4 lectures worth of material.

Review questions will be available for each topic covered in class, and there will be a discussion/review in class before each timed assessment opens up. We will discuss the format of each timed assessment in the review session before the assessment.

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Timed Assessments

The timed assessments are open-note (including the lecture notes, the homeworks, the review sessions, the reference materials, AI, and any notes of your own you wish to have), but they are non-collaborative (no group efforts, please).

If you are caught collaborating during any timed assessment, you will all receive a 0 for that timed assessment and be reported for academic dishonesty.

Administrivia

Grades

Homework: 35%

Discussion Posts: 25%

Attendance: 10%

Timed assessments: 30%

Your grades will be determined by *approximately* this scale:

96.50-100.00: A+

93.50-96.49: A

90.00-93.49: A-

86.50-89.99: B+

83.50-86.49: B …

80.00-83.49: B-

76.50-79.99: C+

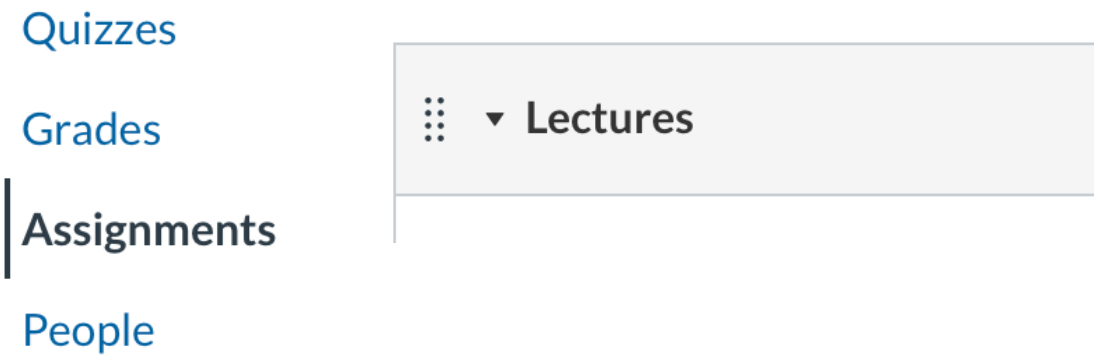
73.50-76.49: C

Administrivia

Zoom class sessions

Our class sessions will be conducted live on Zoom, but recorded so that students who can't attend the live session can still see the class session.

Recorded sessions will be available via the Canvas site. Please check there if you've missed a class session.



What is language?

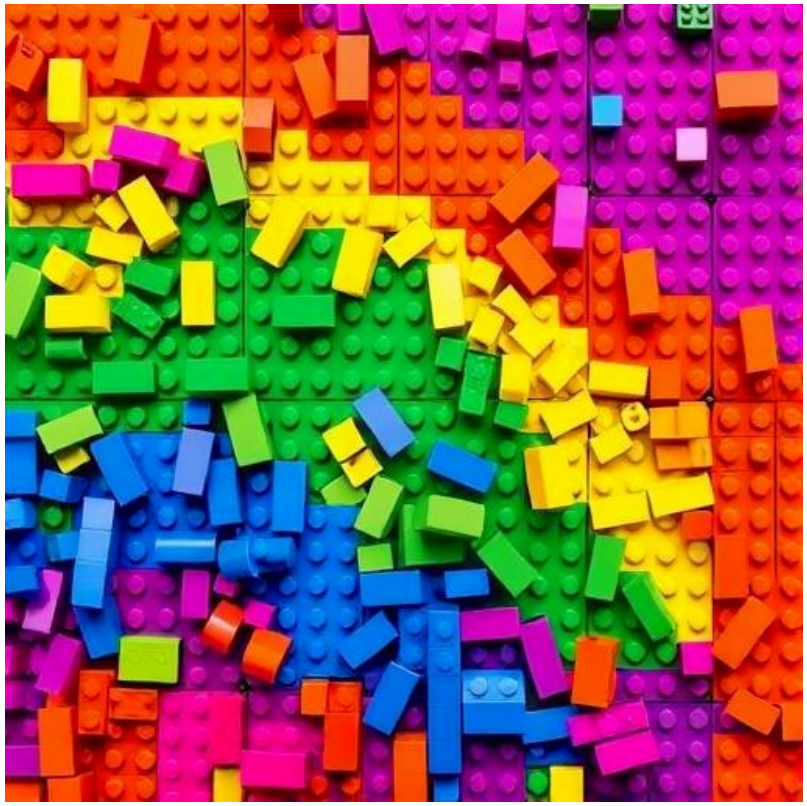
https://www.ted.com/talks/david_peterson_why_language_is_humanity_s_greatest_invention

“Imagine creating any one of those things or, like, building an entire building like this, without being able to use language or without benefiting from any knowledge that was got by the use of language. **Basically, language is the most important thing in the entire world**. All of our civilization rests upon it. And those who devote their lives to studying it -- both how language emerged, how human languages differ, how they differ from animal communication systems -- are linguists. Formal linguistics is a relatively young field, more or less. And it's uncovered a lot of really important stuff. Like, for example, that human communication systems differ crucially from animal communication systems, that all languages are equally expressive, even if they do it in different ways."

What is language?

https://thereader.mitpress.mit.edu/finding-language-in-the-brain/

"What exactly is language? At first thought, it's a continuous flow of sounds we hear, sounds we make, scribbles on paper or on a screen, movements of our hands, and expressions on our faces. But if we pause for a moment, we find that behind this rich experiential display is something different: the smaller and larger building blocks of a Lego-like game of construction, with parts of words, words, phrases, sentences, and larger structures still."

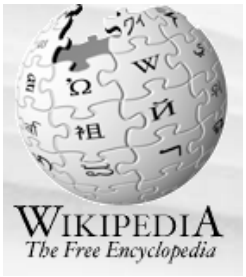


What is language?

https://thereader.mitpress.mit.edu/finding-language-in-the-brain/

"We can choose the pieces and put them together with some freedom, but not anything goes. There are rules, constraints. And no half measures. Either a sound is used in a word, or it's not; either a word is used in a sentence, or it's not. But unlike Lego, language is abstract: Eventually, one runs out of Lego bricks, whereas there could be no shortage of the sound b, and no cap on reusing the word "beautiful" in as many utterances as there are beautiful things to talk about."

What is language?



A language is a system of signals, such as voice sounds, gestures or written symbols, that encode or decode information.

Human languages are usually referred to as natural languages, and the science of studying them is linguistics or language science.

The term "animal languages" is often used for non-human languages. Most researchers agree that these are not as complex or expressive as human language; they may better be described as animal communication. Some researchers argue that there are significant differences separating human language from the communication of other animals, and that the underlying principles are unrelated.

Language and language acquisition

"Language is about as close to magic as we can get. We push air through our lungs, vibrate our vocal chords and move our mouths, and as a result, we can make the people around us become aware of past events, understand our thoughts or plans, perform actions, or come to have new beliefs. This magic is made possible by the shared cognitive systems, or **grammars**, of speakers and listeners….The study of language acquisition aims to uncover how this shared cognitive system arises within the mind of a human child. How does a child exposed to the vibrations of air caused by our utterances come to build a cognitive system for producing and understanding an unlimited number of sentences?" - Lidz & Perkins 2018

Knowledge of language

It's so natural for us to produce and comprehend language that we often don't think about what an accomplishment this is.

Or how we learned language in the first place.

= **language development**

Why study language development?

The big picture, theoretically speaking:

"The study of language acquisition still plays a central role in the debate over how to characterize human cognition, for the same reason that language acquisition played a central role in the cognitive revolution. That is, it is so difficult to explain how language acquisition is possible that accounting for language acquisition is a test not likely to be passed by inaccurate cognitive theories." – Hoff 2008, p.8

Why study language development?

More practically speaking, **applications of language development research**:

Understanding how normal language development proceeds so that we can help children who have problems with their language development

(language pathology)

Why study language development?

More practically speaking, **applications of language development research**:

Understanding how learning more than one language works, and how to best teach children who are learning multiple languages simultaneously

(language pedagogy)

The interaction of theory & practice

These two areas aren't always separate - insights from one can help understanding in the other.

Example: **Research on children with autism**
(Tager-Flusberg 1994, 2007)

The interaction of theory & practice

Example: **Research on children with autism**
(Tager-Flusberg 1994, 2007)

Autistic children have severe communicative deficiencies.
However, they still acquire language structure.

Implication: Learning language involves more than learning how to fulfill a need to communicate.

The interaction of theory & practice

Example: **Research on children with autism**

(Tager-Flusberg 1994, 2007)

Implication: Learning language involves more than learning how to fulfill a need to communicate.

What this means: applied language development research influences understanding of the process of language development

What's all the fuss about language development?

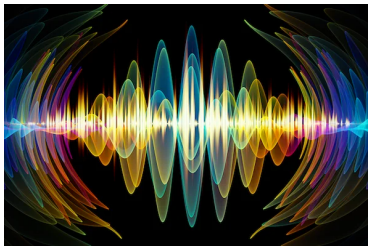
What's all the fuss about language development?

Children are amazing at learning language.
It's magical.

"Language is about as close to magic as we can get. We push air through our lungs, vibrate our vocal chords and move our mouths, and as a result, we can make the people around us become aware of past events, understand our thoughts or plans, perform actions, or come to have new beliefs." - Lidz & Perkins 2018

"This magic is made possible by the shared cognitive systems…of speakers and listeners….” - Lidz & Perkins 2018

"The study of language acquisition aims to uncover how this shared cognitive system arises within the mind of a human child." - Lidz & Perkins 2018



"How does a child exposed to the vibrations of air caused by our utterances come to build a cognitive system" capable of this communicative magic? - Lidz & Perkins 2018

[Extra] “The Linguistic Genius of Babies”

http://www.ted.com/talks/patricia_kuhl_the_linguistic_genius_of_babies.html

(up through 10:07, but especially through 7:55)

Children are amazing at learning language

Wait…what exactly do you know when you know a language?

Children are amazing at learning language

Wait…what exactly do you know when you know a language?

By one recent estimate (Mollica & Piantadosi 2019), about 12.5 million bits of information

https://www.sciencedaily.com/releases/2019/03/190327134547.htm

Wait…what exactly do you know when you know a language?

A lot!

[5]'s estimate for language knowledge. It may seem surprising but, in terms of digital media storage, our knowledge of language almost fits compactly on a floppy disk. The best-guess estimate implies that learners must be remembering 1000–2000 bits *per day* about their native language, which is a remarkable feat of cognition. Our lower bound is around a million bits, which implies that learners would remember around 120 bits each day from birth to 18 years. To put our lower estimate in perspective, each day for 18 years a child must wake up and remember, perfectly and for the rest of their life, an amount of information equivalent to the information in this sequence,

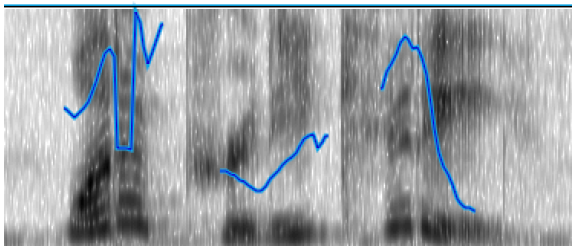
01101000011010010110010001100100011001010110111001100001011000110110001101101111011100100110010001101001011011110110111001100100011010010110111101101110

Naturally, the information will be encoded in a different format—presumably one which is more amenable to the working of human memory. But in our view, both the lower and best-guess bounds are explainable only under the assumption that language is grounded in remarkably sophisticated mechanisms for learning, memory, and inference.

Wait…what exactly do you know when you know a language?

A lot!

You know how to identify words in fluent speech (speech segmentation)



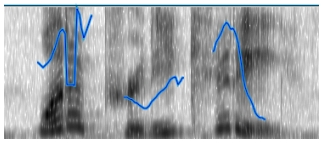
wʌɾəpɹɪɾikɪɾi

wʌɾ ə pɹɪɾi kɪɾi

what a pretty kitty!

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

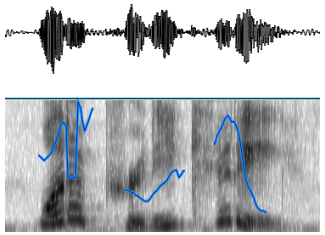
You know how to pronounce words (phonology)

✓ KI tty

✗ ki TTY

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

✓KI tty

✗ki TTY

phonology

You know that certain words behave like other words (syntactic categorization)

owl

Countable **Noun**

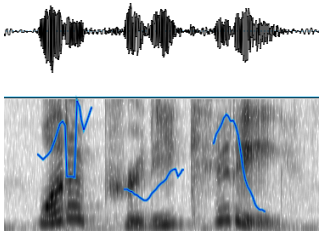
what a pretty ___!

penguin

kitty

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

✓KI tty

✗ki TTY

phonology

Noun

penguin owl

kitty

syntactic categorization

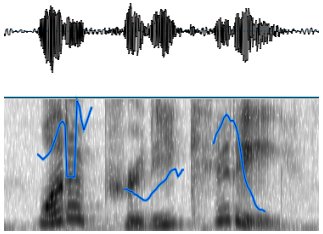
You know how to interpret words in context (syntax, semantics)

"Oh look — a kitty!"
"He's such a pretty kitty!"

"Look — there's another one!"

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

✓ KI tty

✗ ki TTY

phonology

Noun

penguin owl

kitty

syntactic categorization

"he" "one"

syntax, semantics

You know how to put words together to ask questions (syntax)

This kitty was bought as a present for someone.

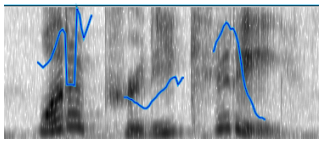
Lily thinks this kitty is pretty.

☹

Who does Lily think the kitty for is pretty?

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

✓ KI tty

✗ ki TTY

phonology

Noun

penguin owl

kitty

syntactic categorization

Who does Lily think the kitty for is pretty? ☹

syntax

syntax, **semantics**

"he" "one"

You know how to identify the right interpretation in context (pragmatics)

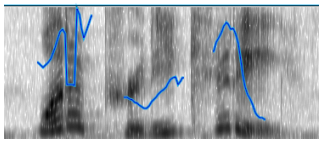
"Every kitty didn't sit on the stairs"

✗ No kitties sat on the stairs.

✓ Not all kitties sat on the stairs.

Wait…what exactly do you know when you know a language?

A lot!



what a pretty kitty!

speech segmentation

✓ KI tty

✗ ki TTY

phonology

Noun

penguin owl

kitty

syntactic categorization

Who does Lily think the kitty for is pretty? ☹

syntax

"he" "one"

syntax, **semantics**

"I think I saw **all the kitties on the stairs.**"

"No - **every** kitty did**n't** sit on the stairs"

✓ Not all kitties sat on the stairs.

pragmatics

Wait…what exactly do you know when you know a language?

A lot!

phonology

speech segmentation

syntactic categorization

pragmatics

syntax

syntax, semantics

So how exactly do children learn all this?

So how exactly do children learn all this?

We know they do it relatively quickly.

speech segmentation

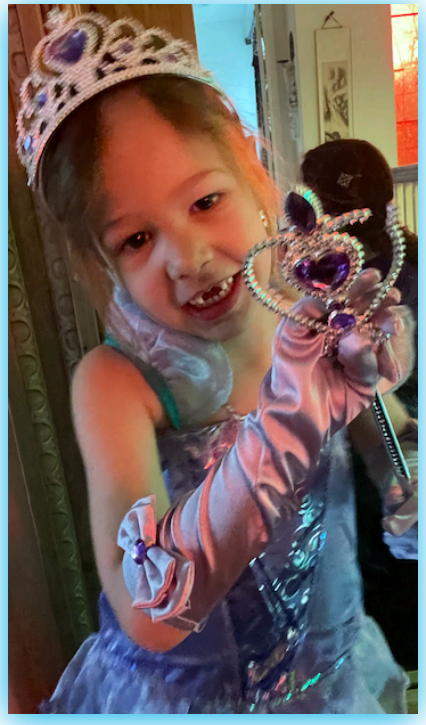
phonology

syntactic categorization

syntax

syntax, semantics

pragmatics

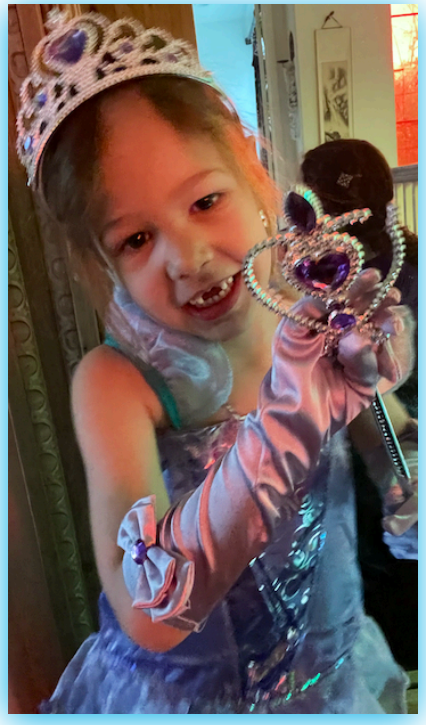


Much of the linguistic system is already known by **age 4**.

Interesting: They do this mostly without explicit instruction.

So how exactly do children learn all this?

And when they do get explicit instruction, they don't really pay attention to things that don't impact meaning.



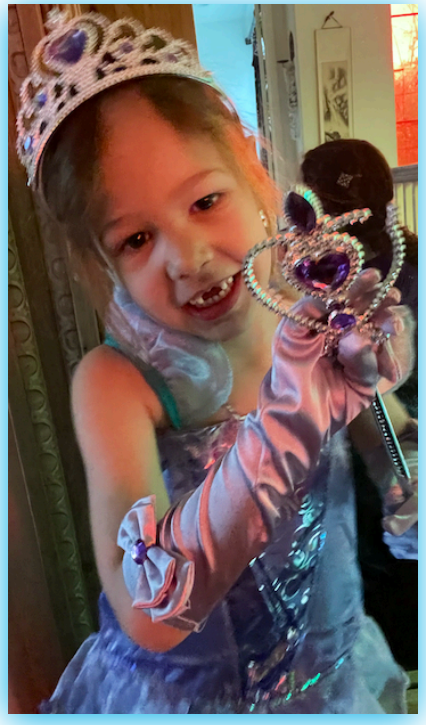
(From Martin Braine)

Child: Want other one spoon, Daddy.
Father: You mean, you want the other spoon.
Child: Yes, I want other one spoon, please Daddy.
Father: Can you say "the other spoon"?
Child: Other…one…spoon.
Father: Say "other".
Child: Other.
Father: "Spoon."
Child: Spoon.
Father: "Other spoon."
Child: Other…spoon. **Now give me other one spoon**?

So how exactly do children learn all this?

In general, imitation isn't likely to get them too far.…

Imitation certainly *is* useful for learning some aspects of language, such as learning that the sequence of sounds "*cat*" refers to a furry, purring pet.



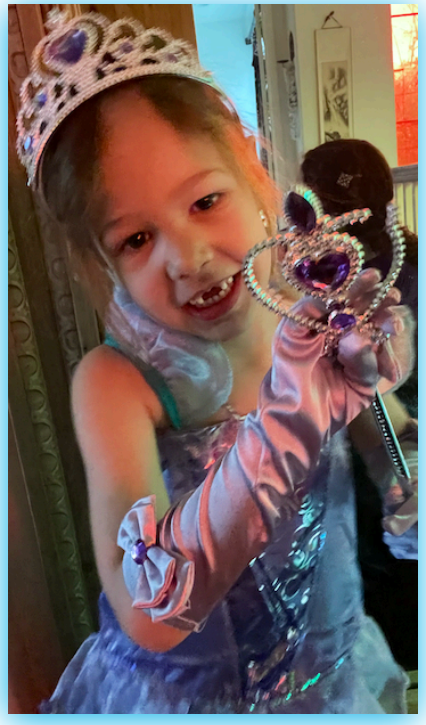
So how exactly do children learn all this?

In general, imitation isn't likely to get them too far.…

However, children can't learn how to understand and produce full sentences by imitating what they hear and repeating it word for word.

Why not?

One reason: Most sentences are novel – you understand and produce them on the fly, and may never have heard them before.

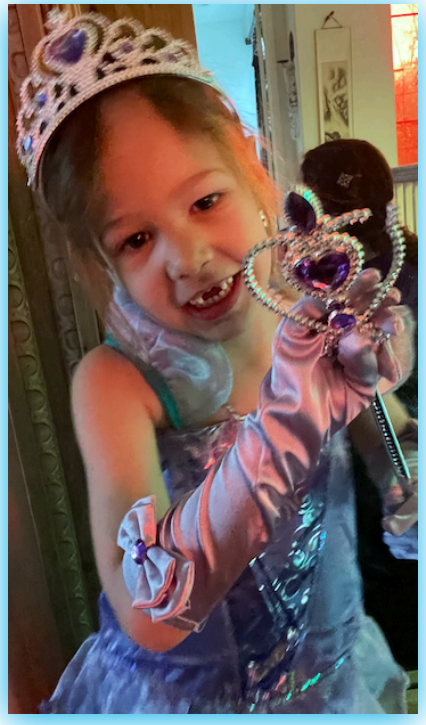


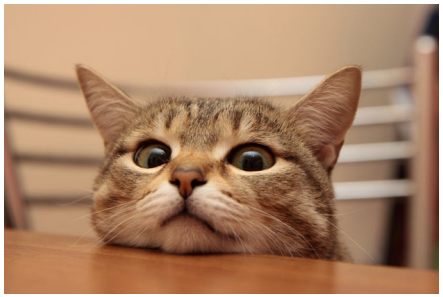
So how exactly do children learn all this?

In general, imitation isn't likely to get them too far.…

Also, it turns out that children are bad at imitating sentences where they don't know some of the words (so how could they learn those words by imitating them?):

"The cat is hungry" becomes "Cat hungry."

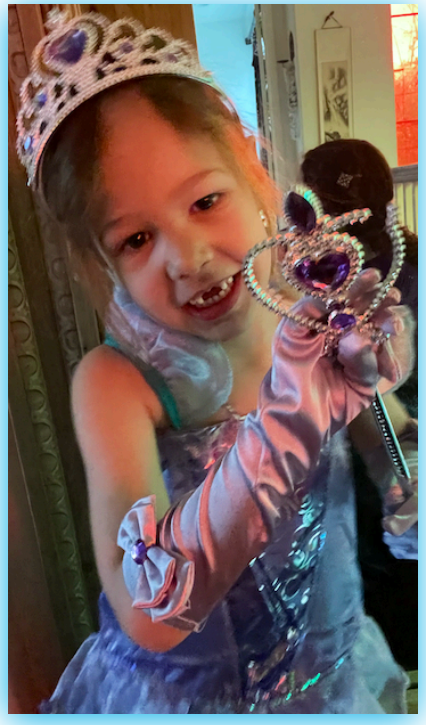




So how exactly do children learn all this?

In general, imitation isn't likely to get them too far.…

In addition, children don't often repeat word-for-word what adults around them say.



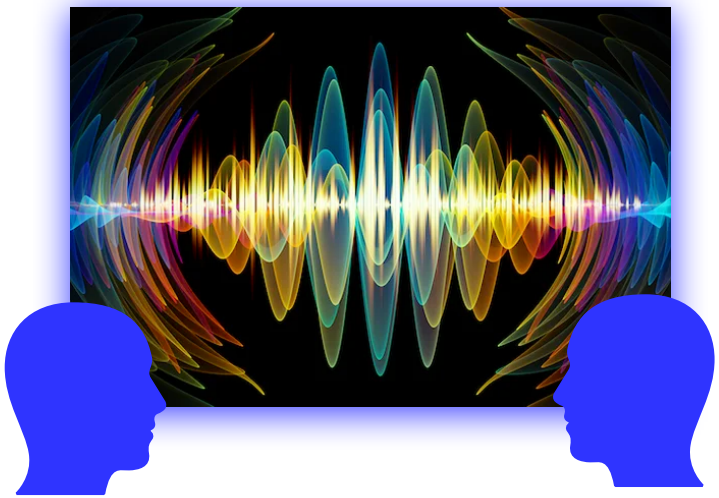
[Extra] More imitation problems

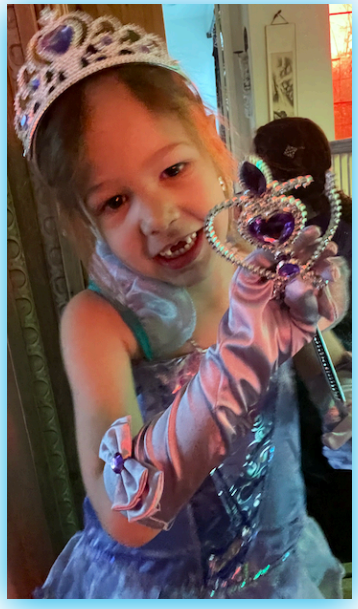
https://www.youtube.com/watch?v=a7Un06tDOn0&feature=youtu.be

5:31-6:27

What kids are doing

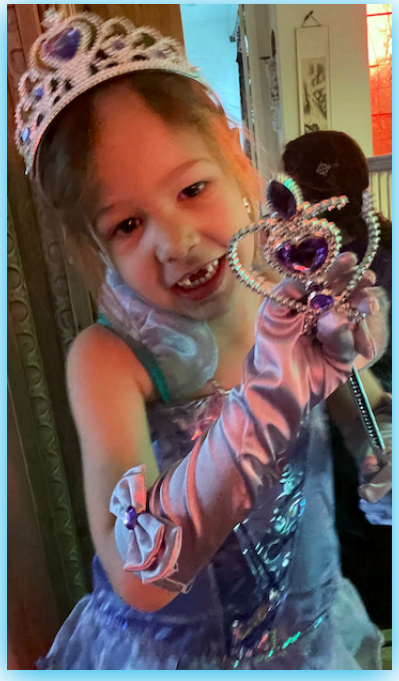
Extracting patterns and **making generalizations** from the surrounding data mostly just by hearing examples of what's allowed in the language.





The rules of language = grammar

It's also unlikely children learn by being explicitly taught all the rules of their language. This is because once we go beyond the most superficial things (like "cat" is a furry, purring pet), **most of our knowledge is subconscious**.



We know it – but we don't know *how* we know it or why it's so.

language is
communicative magic

Most of our native language knowledge isn't conscious.

We know it – but we don't know *how* we know it or *why* it's so.

Some things you probably know

We should name this new product for an English-speaking market!

Let’s call it a…

Some things you probably know

We should name this new product for an English-speaking market!

Let's call it a…

strimp stvimp

Some things you probably know

We should name this new product for an English-speaking market!

Let's call it a…

strimp ✓

stvimp ✗

Some things you probably know

You know what sounds go together to sound English-like.

strimp ✓

stvimp ✗

Some things you probably know

strimp ✓

stvimp ✗

Let's think about how to pronounce the "s" at the end of these words

cat**s**

dog**s**

Some things you probably know

strimp ✓

stvimp ✗

Let's think about how to pronounce the "s" at the end of these words

This one sounds like "s".

cat**s**

dog**s**

This one sounds like "z".

Some things you probably know

strimp ✓

stvimp ✗

You know that these “s” sounds are pronounced differently!

This one sounds like “s”.

cat**s**

dog**s**

This one sounds like “z”.

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

Let's figure out who "she" could be in some sentences.

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed.

cat**s**

dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

While she was wearing a hat, Lindy laughed.

While Lindy was wearing a hat, Lindy laughed.

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

While she was wearing a hat, Lindy laughed.

While Lindy was wearing a hat, Lindy laughed.

Could “she” = Lindy?

✓

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓

While Lindy was wearing a hat, she laughed.

cat**s**

dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓

While Lindy was wearing a hat, she laughed.

While Lindy was wearing a hat, Lindy laughed.

cat**s**

dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓

While Lindy was wearing a hat, she laughed.

While Lindy was wearing a hat, Lindy laughed.

cat**s**

dog**s**

Could “she” = Lindy? ✓

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.

Lindy laughed while she was wearing a hat.

cat**s**

dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.

Lindy laughed while she was wearing a hat.
Lindy laughed while Lindy was wearing a hat.

cat**s**
dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.

Lindy laughed while she was wearing a hat.
Lindy laughed while Lindy was wearing a hat.

cat**s**
dog**s**

Could “she” = Lindy? ✓

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.
Lindy laughed while she was wearing a hat.

She laughed while Lindy was wearing a hat.

cat**s**
dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.
Lindy laughed while she was wearing a hat.

She laughed while Lindy was wearing a hat.
Lindy laughed while Lindy was wearing a hat.

cat**s**
dog**s**

Could “she” = Lindy?

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.
Lindy laughed while she was wearing a hat.

She laughed while Lindy was wearing a hat.
Lindy laughed while Lindy was wearing a hat.

cat**s**
dog**s**

Could “she” = Lindy? ✗

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓
While Lindy was wearing a hat, she laughed.
Lindy laughed while she was wearing a hat.

She laughed while Lindy was wearing a hat.
Lisa laughed while Lindy was wearing a hat.

cat**s**
dog**s**

"she" = someone else

✗

Some things you probably know

strimp ✓

stvimp ✗

While she was wearing a hat, Lindy laughed. ✓

While Lindy was wearing a hat, she laughed.

Lindy laughed while she was wearing a hat.

"she" = Lindy

She laughed while Lindy was wearing a hat. ✗

cat**s**

dog**s**

You know how to interpret pronouns like "she".

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓

While she…, Lindy…

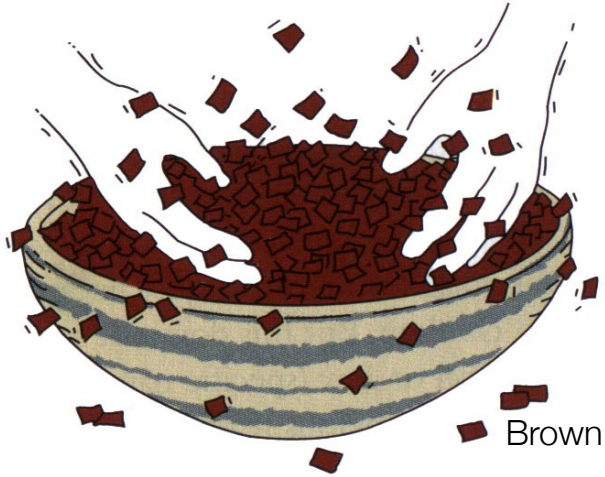
While Lindy…, she…

Lindy…while she…

✗

She …while Lindy…

Let's figure out what the nonsense word dax refers to in this picture



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

While she…, Lindy…

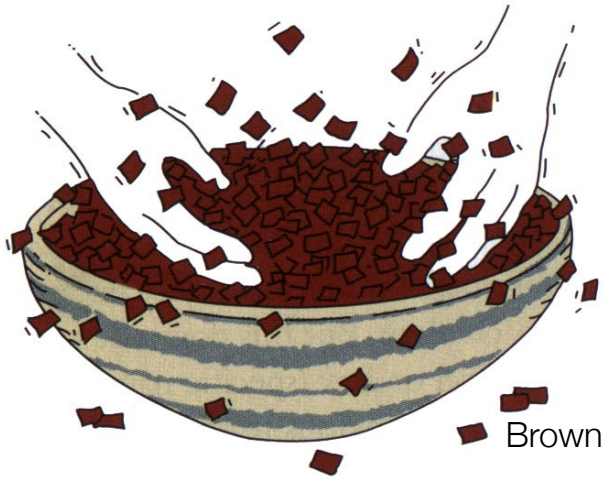
While Lindy…, she…

Lindy…while she…

She …while Lindy…

He's daxing!

What does dax refer to?



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓

While she…, Lindy…

While Lindy…, she…

Lindy…while she…

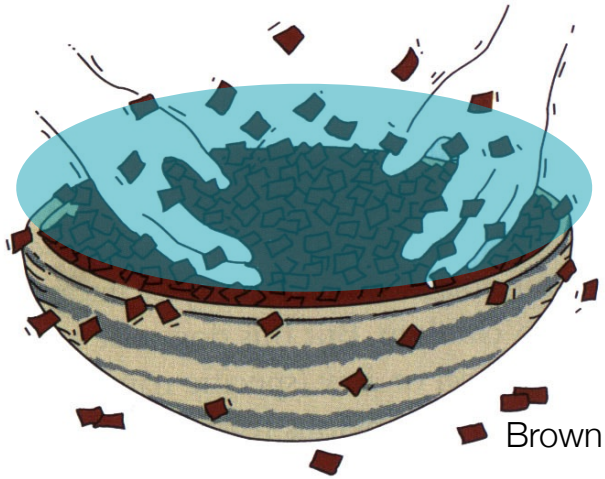
✗

She …while Lindy…

He's daxing!

What does dax refer to?

The action the hands are doing



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

While she…, Lindy…

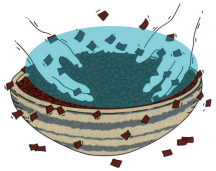
While Lindy…, she…

Lindy…while she…

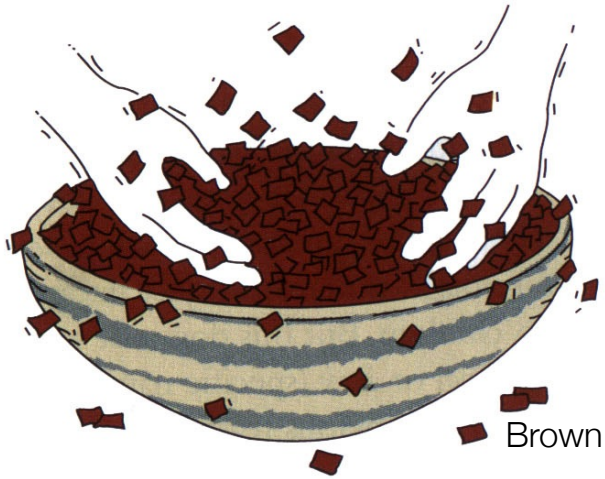
She …while Lindy…

Look — a dax!

He's daxing!



What does dax refer to?



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

Look — a dax!

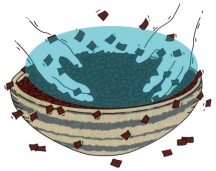
✓ While she…, Lindy…

While Lindy…, she…

Lindy…while she…

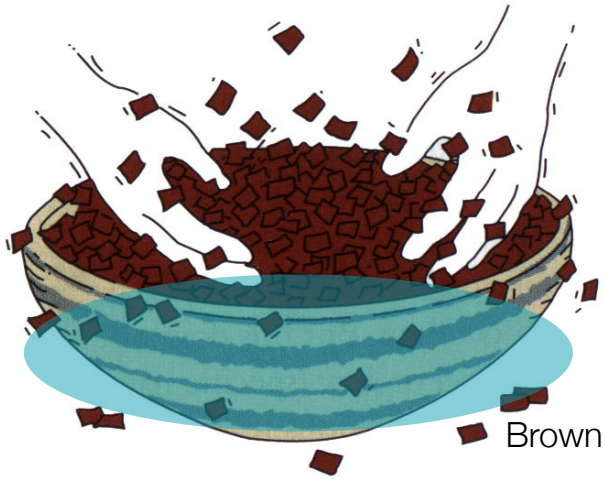
✗ She …while Lindy…

He's daxing!



What does dax refer to?

The single object



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓ While she…, Lindy…

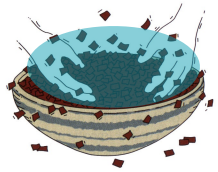
While Lindy…, she…

Lindy…while she…

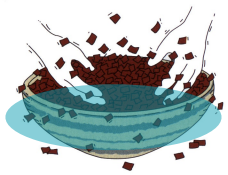
✗ She …while Lindy…

Look — some dax!

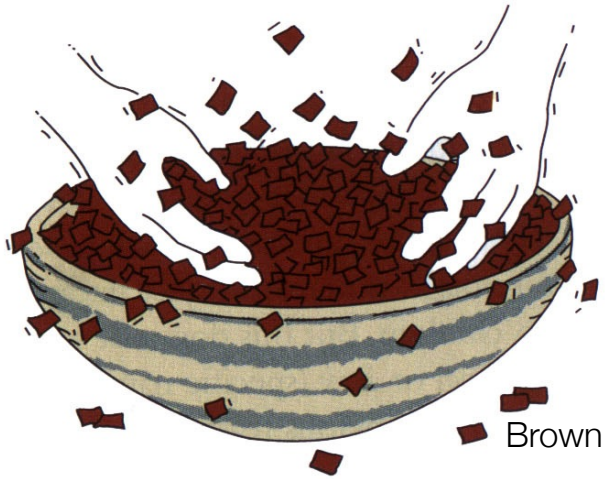
He's daxing!



Look — a dax!



What does dax refer to?



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓ While she…, Lindy…

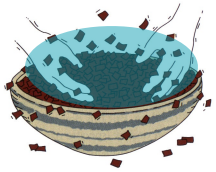
While Lindy…, she…

Lindy…while she…

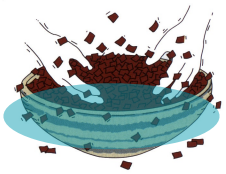
✗ She …while Lindy…

Look — some dax!

He's daxing!

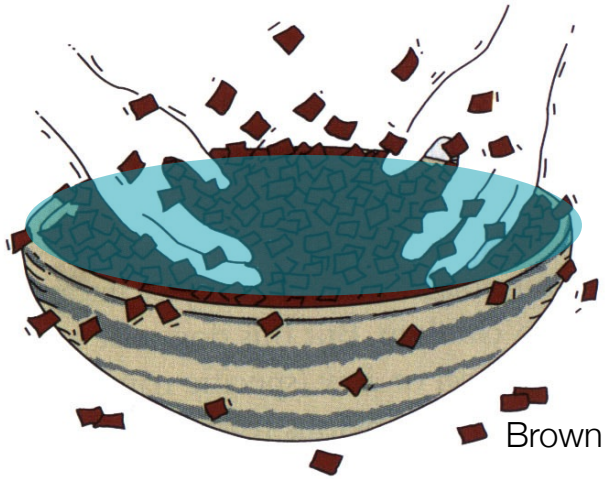


Look — a dax!



What does dax refer to?

The stuff



Brown 1957

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓

While she…, Lindy…

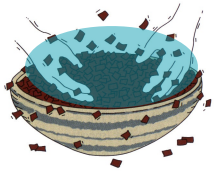
While Lindy…, she…

Lindy…while she…

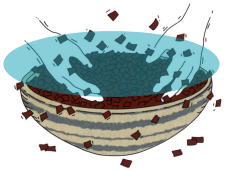
✗

She …while Lindy…

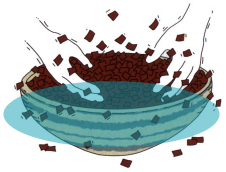
He's daxing!



Look — some dax!



Look — a dax!



You know how to use the language surrounding an unknown word to figure out what it refers to.

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓

While she…, Lindy…

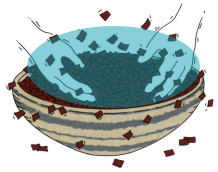
While Lindy…, she…

Lindy…while she…

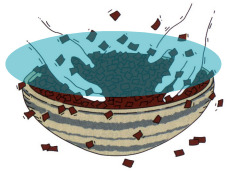
✗

She …while Lindy…

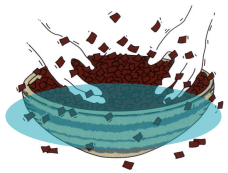
He's daxing!



Look — some dax!



Look — a dax!



This ability to use the surrounding language makes Lewis Carroll's *Jabberwocky* poem, with all its nonsense words, so enjoyable (and understandable).

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

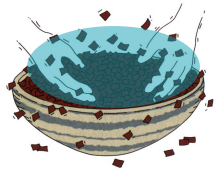
✓ While she…, Lindy…

While Lindy…, she…

Lindy…while she…

✗ She …while Lindy…

He's daxing!



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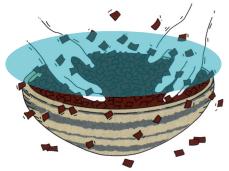
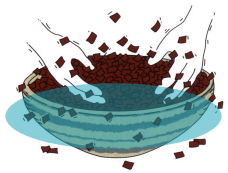


Look — a dax!



Jabberwocky

by Lewis Carroll

Twas brillig, and the slithy toves

Did gyre and gimble in the wabe:

All mimsy were the borogoves,

And the mome raths outgrabe

Some things you probably know

strimp ✓

stvimp ✗

cat**s**

dog**s**

✓

While she…, Lindy…

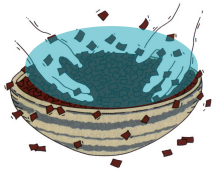
While Lindy…, she…

Lindy…while she…

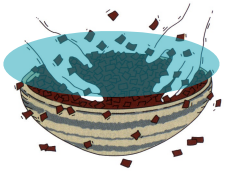
✗

She …while Lindy…

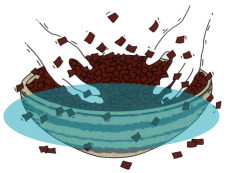
He's daxing!



Look — some dax!



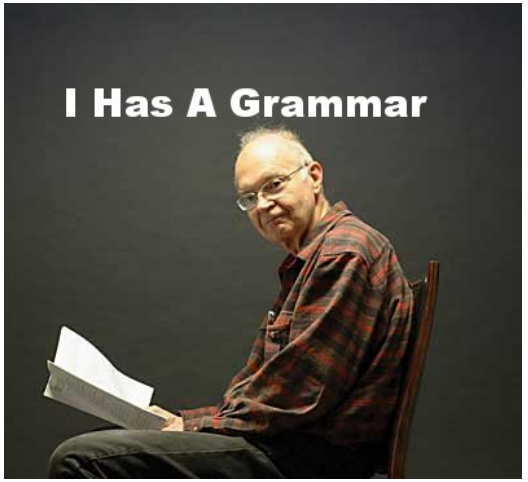
Look — a dax!



Children have to learn all these things (and more!) for their native language(s)

What's being learned:

Patterns or "rules" of language = grammar



A distinction:
prescriptive vs. descriptive grammar rules

Prescriptive: what you have to be taught in school, what is prescribed by some higher "authority". You don't learn this just by listening to native speakers talk.

"Don't end a sentence with a preposition."
" 'Ain't' is not a word."

A distinction:
prescriptive vs. descriptive grammar rules

Descriptive: what you pick up from being a native speaker of the language, how people actually speak in their day-to-day interactions. You don't have to be explicitly taught to follow these rules.

The dwarf is who Sarah first talked ***with***.

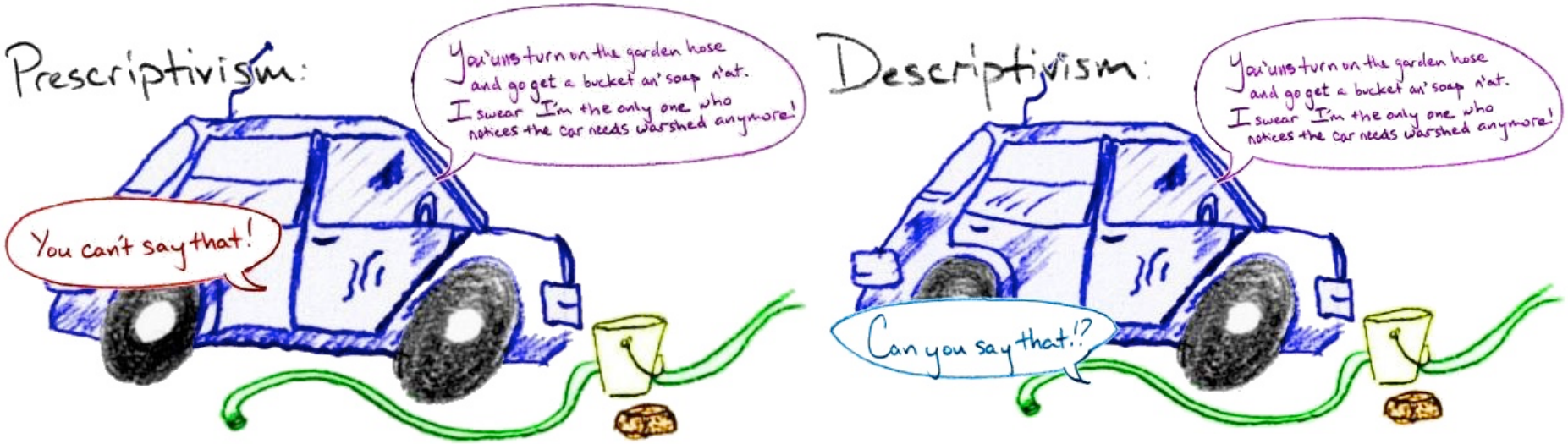
"You're horrible!" "No, I ***ain't*** - I'm Hoggle!"

[Extra] A distinction: prescriptive vs. descriptive grammar rules

The LingSpace: Word Crimes & Misdemeanors
~0.26 up through ~8:26

http://www.thelingspace.com/episode-3 (+ commentary)
https://www.youtube.com/watch?t=85&v=eFlBwBwL_iU

In a nutshell:
prescriptive vs. descriptive grammar rules



"You can't say that!" vs. "Can you say that!?"

http://specgram.com/CLIV.3/04.phlogiston.cartoon.xi.html

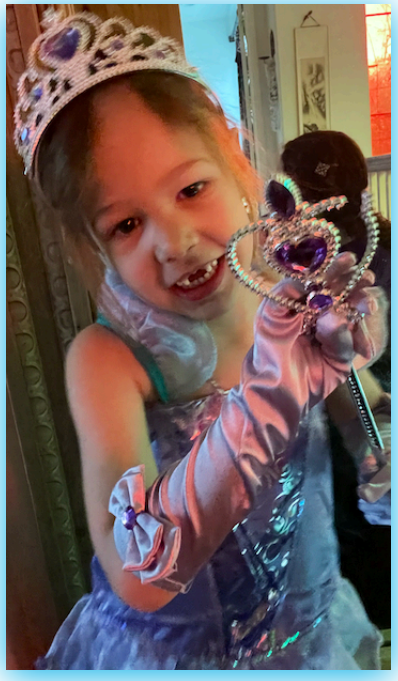
Recap: Big picture

Studying language development can help us understand cognition in general, as well as issues in language pathology and language pedagogy.

Knowledge of language includes knowledge of many different systems.

Our language knowledge consists of many implicit rules (sometimes called a grammar), which means we probably can't explicitly teach children these rules.

In language acquisition, we care about the acquisition of descriptive rather than prescriptive rules of grammar.



speech segmentation

phonology

syntactic categorization

syntax

syntax, semantics

pragmatics

Questions?

Start looking over the review questions and HW1 (due 10/6/25), and feel free to start commenting on the material. You should be able to do up through 5 on the introductory review questions and up through 4 on HW1.