Psych 156A/ Ling 150: Psychology of Language Learning

Lecture 1
Introduction

Administrivia

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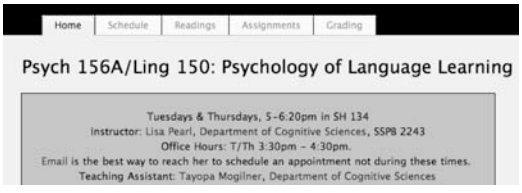
Class web page:
http://www.socsci.uci.edu/~lpearl/courses/psych156a_2008spring/index.html

Accessible from EEE, as well. Contains overview, schedule, readings, course assignments, and grading policies.



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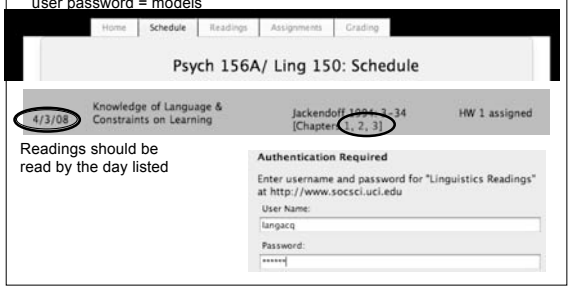
Important to access readings
Click on readings in schedule page
user name = langacq
user password = models



Readings should be read by the day listed

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Assignments

Homework:
Several throughout the quarter, usually due 1 week after they're assigned

Collaboration is allowed and encouraged. However…
You may discuss the homework together, but you must write up your answers separately.

You must write the name of your collaborators on your assignment when you turn it in.

If you do not do both these things, it will be considered academic dishonesty and you will receive a 0 for that assignment.

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Assignments

In-Class Quizzes:
Several throughout the quarter, usually after we've covered a topic.

These are open-note.

They will usually comprise a small portion of the class period, not the entire thing.

These are *not* collaborative. Anyone found collaborating on an in-class quiz will receive a 0 for that quiz.

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Assignments

Final assignment:

You may choose to either take a final in-class exam 6/12/08 from 4pm-6pm, or submit a final paper by the same time. You only need to do one of these. If you are worried about your grade, you may choose to do both and take the higher of the two grades.

You must indicate which you will do by 5/29/08. Please email the instructor with your choice, and indicate your paper topic if you choose to do the paper.

Final exam:

The final exam will be closed-notes and non-collaborative.

If you are found using any kind of notes or collaborating with other classmates during the final exam, you will receive a 0.

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Assignments

Final paper:

In place of a final exam, you will write a final paper reviewing an article on language learning. Details are listed on the web page.

Main components:

By the end of week 9: inform instructor and teaching assistant of article you will write your final paper on. This should be done via email.

By the time of the final (4pm on 6/12/08), you will email your paper to the instructor and teaching assistant (.doc format preferred, but .pdf okay as well).

Papers must *not* be collaborative efforts. The paper must be written up individually. If you plagiarize someone else's work, you will receive a 0 for the paper.

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Grades

Homework: 40%

Quizzes: 40%

Final Assignment (Exam or Paper): 20%

Your grades will not be curved throughout the quarter. Instead, your final grade will be assessed by the scale on the web page.

90-100: A+	75-80: B+	…
85-90: A	70-75: B	
80-85: A-	65-70: B-	

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Schedule

"This is our wonderfully ambitious schedule. We'll attempt to keep with it, but it is subject to modification."

Topics:

Language & Learning	(4/1-4/3)
Sounds	(4/8-4/15)
Sounds of Words	(4/17-4/22)
Words & Categories	(4/24-4/29)
Rules about Words	(5/1-5/6)
Statistical Learning & Poverty of the Stimulus	(5/8-5/20)
Language Structure	(5/22-6/5)

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.

About Language

Language is a complex system of knowledge: includes sound structure, word structure, sentence structure, mapping from sentence structure to meaning, unspoken rules of conversation…

Languages can differ significantly on how they instantiate this knowledge.

And despite all this complexity, children of all languages acquire the necessary knowledge to speak their native language.

Don't goblins like children?

Goblins like children.

goblins

goblin (plural) = goblin + s

gob lins

g a b l ɪ n z

Jackendoff (1994)

"For the moment, the main thing is to appreciate how hard a problem this is. The fact that we can talk (and cats can't) seems so obvious that it hardly bears mention. But just because it's obvious doesn't mean its easy to explain."

Kids Do Amazing Things

Much of the linguistic system is already known by age 3.

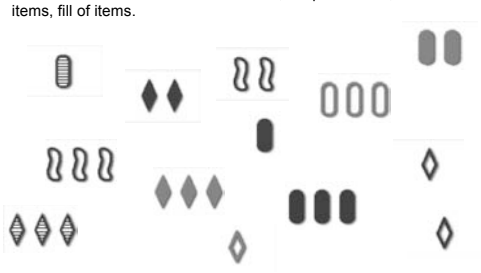
…when kids can't tie their own shoes or even count to 4.

What kids are doing: extracting patterns and making generalizations from noisy data sets without explicit instruction.

"Rules" of language = grammar

A learning analogy: Set

Here are some cards - they have some salient properties associated with them: number of items, shape of items, color of items, fill of items.



A learning analogy: Set

Task: Find Sets.

Here's one:

What generalizations might you make about Sets?

A learning analogy: Set

Task: Find Sets.

Here's one:

What generalizations might you make about Sets?

Set = all shapes, fills, and number of items the same?

A learning analogy: Set

Task: Find Sets.

Here's another one:

Does this fit the generalization?

Set = all shapes, fills, and number of items the same?

A learning analogy: Set

Task: Find Sets.

Here's another one:

Does this fit the generalization?

~~Set = all shapes, fills, and number of items the same?~~
Set = all shapes and fills the same?

A learning analogy: Set

Task: Find Sets.

Here's another one:

What about this one?

~~Set = all shapes, fills, and number of items the same?~~
Set = all shapes and fills the same?

A learning analogy: Set

Task: Find Sets.

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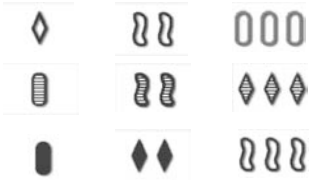
~~Set = all shapes and fills the same?~~
Set = all fills the same?

A learning analogy: Set

Task: Find Sets.

Are these Sets?



A learning analogy: Set

Task: Find Sets.

Are these Sets?

Set = all fills the same?

Yes

Yes

No

A learning analogy: Set

Task: Find Sets.

Are these Sets?

Set = all fills the same?

Yes √ Yes

Yes √ Yes

No √ No

A learning analogy: Set

Task: Find Sets.

Here are some more examples of sets:

A learning analogy: Set

Task: Find Sets.

Here are some more examples of sets:

Set = all fills the same?

X Uh oh…

√

√

We need a different generalization…

The Grammar of Set

Yes

Complex rule!!!

A 'Set' consists of three cards in which each feature is EITHER the same on each card OR is different on each card. That is to say, any feature in the 'Set' of three cards is either common to all three cards or is different on each card.

No

Back to Kids & Language

Children infer rules with this amount of complexity (and more!) from examples of language. And sometimes, even when there's noise.

Noise Analogy: "All these are Sets."

Back to Kids & Language

Children infer rules with this amount of complexity (and more!) from examples of language. And sometimes, even when there's noise.

Noise Analogy: "All these are Sets."

This one isn't really a Set…

Knowledge of Language & Hidden Rules

Some examples from language:

You know that…

…*strep* is a possible word of English, while *stvep* isn't.

Knowledge of Language & Hidden Rules

Some examples from language:

You know that…

…"Who did you see who did that?" is not a grammatical question in English

(Instead: "Who did you see do that?")

Knowledge of Language & Hidden Rules

Some examples from language:

You know that…

…In "She ate the peach while Sarah was reading", *she* ≠ *Sarah*

but *she* can be *Sarah* in all of these:

Sarah ate the peach while she was reading.
While she was reading, Sarah ate the peach.
While Sarah was reading, she ate the Peach.

Knowledge of Language & Hidden Rules

Some examples from language:

You know that…

…the 's' in 'cats' sounds different from the 's' in goblins

cats: 's' = /s/

goblins: 's' = /z/

Why rules?

"The expressive variety of language use implies that a language user's brain contains unconscious grammatical principles" - Jackendoff (1994)

Example: Most sentences we have never seen or used before, but we can still understand them.

Question: Can speakers simply memorize all the possible sentences of a language the way they learn vocabulary of their language? Not if there are an infinite number of them…

Linguistic Infinity

Hoggle has two jewels.
Hoggle has three jewels.
Hoggle has four jewels.
…
Hoggle has forty-three million and five jewels.
…

One (dumb) way to get infinity

Linguistic Infinity

An aardvark is not an antelope.
…
An aardvark is not a zenith.
…
A penguin is not a goblin.
…

Another way to get a really large number of sentences…

Linguistic Infinity

An aardvark is not an antelope.
…
An aardvark is not a zenith.
…
A penguin is not a goblin.
…

Another way to get a really large number of sentences…

And another…

If an aardvark is not an antelope, then an aardvark is not an ant.
…
If an aardvark is not a zenith, then a peach is not an idea.
…
If a penguin is not a goblin, then a fruit is not a fairy.
…

Linguistic Creativity

What lists include this sentence?

Through dangers untold and hardships unnumbered, I have fought my way here to the castle beyond the goblin city to take back the child you have stolen, for my will is as strong as yours and my kingdom is as great.

Or this one?

In the purple powder room, there lived a grumpy dollop of cream that slept lazily and yelled silently by turns, often scaring the silverware with its fierce pacific nature.

Linguistic Infinity

The point: our minds store words and meanings and the patterns into which they can be placed (grammar).

Sentence Patterns:

Hoggle has *n* jewels.

An X is not a Y.

Since an X is not a Y, a Z is not a W.

Linguistic Infinity

A more complex pattern: X Verbs that [sentence].

This shows recursion because "X Verbs that [sentence]" is itself a sentence.

Sentence --> X Verbs that Sentence

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This shows recursion because "X Verbs that [sentence]" is itself a sentence.

Sentence --> X Verbs that Sentence

Sentence --> Hoggle thinks that [Sentence]
--> Hoggle thinks that [Sarah has Jareth's attention].
--> Hoggle thinks that [Ludo knows that
[Sarah has Jareth's attention]].
--> Hoggle thinks that [Ludo knows that
[Didymus suspects that
[Sarah has Jareth's attention]]].

Possible objections to a mental rule set

"Why should I believe I store a set of rules unconsciously in my mind? I just understand sentences because they make sense."

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But why do some sentences make sense and others don't?

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Why can we recognize patterns even when some of the words are unknown?

'Twas brillig, and the slithy toves
did gyre and gimble in the wabe...

Possible objections to a mental grammar

"What about people who speak ungrammatically, who say things like 'We ain't got no bananas'? They obviously don't have grammars in their heads."

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Prescriptive vs. Descriptive Grammar

Prescriptive: what you have to be taught in school

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

Descriptive: what you pick up from being a native speaker of the language

"We ain't got no bananas."
*Ain't no we got bananas.

Possible objections to an unconscious rule set

"When I talk, the talk just comes out - I'm not consulting any rule set."

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"When I talk, the talk just comes out - I'm not consulting any rule set."

Analogy: wiggling your fingers

When you want to wiggle your fingers, you "just wiggle them".

But your finger-wiggling intention was turned into commands sent by your brain to your muscles, and you're never conscious of the process unless something interferes with it. Nonetheless, there *is* a process, even if you're not aware of it.