

Psych 156A/ Ling 150: Acquisition of Language II

Lecture 1 Introduction to Language Acquisition

Administrivia

Instructor:

Lisa Pearl, Department of Cognitive Sciences

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

Office Hours: W, 1:30-3:00pm in SBSG 2314



Course Reader:

Liz Seward

mseward@uci.edu



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Class web page:

http://www.socsci.uci.edu/~lpearl/courses/psych156A_2010spring/index.html

Accessible from EEE, as well. Contains overview (including office hours), schedule, readings, course assignments, and grading policies.

Home Schedule Readings Assignments Grading

Psych 156A/Ling 150: Acquisition of Language II

Tuesdays & Thursdays, 3:30pm-4:50pm in SSL 290
Instructor: Lisa Pearl, Department of Cognitive Sciences, SBSG 2314
Office Hours for Lisa: Wednesday 1:30pm - 3:00pm, and by appointment. Email is the best way to reach her to schedule an appointment not during regular office hours.
lpearl@uci.edu

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Important to access readings

Click on readings in schedule page

user name = langacq

user password = models

Lecture notes do not require a password

Authentication Required

Enter username and password for "Linguistics Readings" at <http://www.socsci.uci.edu>

User Name:

langacq

Password:

models

Home Schedule Readings Assignments Grading

Psych 156A/ Ling 150: Schedule

Date	Topic	Readings (to be read by this class)	Notices & Assignments	Reference Material (not required reading)
3/30/10	Introduction to Language Acquisition			Jackendoff 1994: 3-34 [Chapters 1, 2, 3]

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Assignments

Homework:

Three throughout the quarter, usually due just after we finish discussing the relevant topics in class. Collaboration is allowed and highly encouraged. However...

If you collaborate, you must write up your answers separately, and you must write the names 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

Homework Advice:

Homework assignments are usually available as soon as we begin discussing the relevant topics. HW1 is already available on the website. The optimal strategy is to be working on the relevant homework problems as we discuss the topics in class.

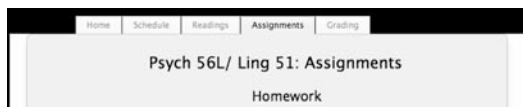
Review questions are also available for each topic, but you are not required to do them. They are just there to help you review the material.

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Assignments

Homework:

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



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Midterm Exam

There will be a midterm exam on 4/27/10. It will cover the material in weeks 1-4. There will be a midterm review in class 4/22/10. Being able to answer the review questions for the relevant topics is the best way to prepare for the exam.

The midterm exam will be open-note, but non-collaborative. If you are found collaborating with other classmates during the midterm exam, you will receive a 0.

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Final Exam/Assignment

Final assignment:

If you have an A in the class by week 10, you may choose to either take the final exam or submit a final paper. Details are on the class webpage, under the "assignments" section.



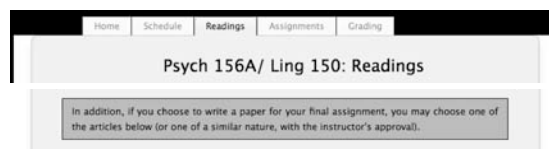
If you do not have an A in the class by week 10, you must take the final exam.

The final exam will be held 6/8/10 from 4 to 6pm. If you are submitting a final paper, it must be turned in by 6pm 6/8/10.

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Final Paper

If you choose to do a final paper in place of a final exam, you will write a short review paper on one of the articles we discuss in class. You must indicate by 6/03/10 that you will be writing a final paper, and which article you will be reviewing. Articles available for review are listed under the "readings" section of the webpage.



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Final Exam

The final exam will focus on the material in weeks 6-10, though there will be some questions from the material in weeks 1-4. There will be a final review in class 6/3/10. Being able to answer the review questions for all the topics is the best way to prepare for the final exam.

The final exam will be open-note, but non-collaborative. If you are found collaborating with other classmates during the final exam, you will receive a 0.

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Grades

Homework: 50%

Midterm: 20%

Final Assignment (Exam or Paper): 30%

Your grades will be determined by approximately this scale (available on the webpage):

96-100: A+	84-88: B+	72-76: C+	...
92-96: A	80-84: B	68-72: C	
88-92: A-	76-80: B-	64-68: C-	

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Extra Credit

You can earn up to 3 percentage points of extra credit two ways (that is, 3 points added to your total grade at the end of the quarter). See the class web page under the "assignments" tab for more details.)

- (1) Participate as a human subject in social science experiments for up to 3 hours (half an hour = half a percentage point).
- (2) Write a four page review paper on a language acquisition article.

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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:

Introduction	(3/30 - 4/1)
Sounds & Sounds of Words	(4/6 - 4/8)
Words & Categories	(4/13 - 4/20)
MIDTERM	(4/27)
Morphology	(5/4 - 5/6)
Phrases	(5/11)
Poverty of the Stimulus & Learning Biases	(5/13 - 5/20)
Sentences & Language Structure	(5/25 - 5/27)
FINAL	(6/8)

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 is Special



René Descartes

"It is a very remarkable fact that there are none ... without even excepting idiots, that they cannot arrange different words together, forming of them a statement by which they make known their thoughts; while on the other hand, there is no other animal, however perfect and fortunately circumstanced it may be, which can do the same."

Language is Special

"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 it's easy to explain. Think of another perfectly obvious, well-known phenomenon: the fact that metals turn red when you heat them. Why does this happen? It could be otherwise - they might just as well turn green or not change color at all. It's a simple phenomenon, easily observable, but the explanation isn't simple at all. It turns out to involve at the very least the theories of electromagnetic radiation and quantum mechanics, two of the more amazing intellectual advances in the past century. So it is, I want to suggest, with the human ability to use language." - Ray Jackendoff, 1994



Language is Special

"What is so special about language? Maybe nothing if you are a snail or a camphor tree. But language is paramount among the capacities that characterize humans, setting us off from even the most perfectly formed and functioning of the other beasts on earth; so, as a matter of species pride – if nothing else – we would hold up language as a marker of our humanity and thus a focus of our scientific interest." (Gleitman & Liberman 1991: xix)



About Language

Language is a complex system of knowledge that all children learn by listening to native speakers in their surrounding environment.



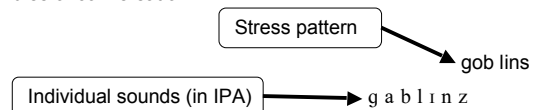
It includes sound structure, word structure, word meaning, sentence structure, mapping from sentence structure to meaning, unspoken rules of conversation...

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goblin (plural) = goblin + s

gob lins

g a b l i n z

About Language

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goblins

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About Language

Language is a complex system of knowledge that all children learn by listening to native speakers in their surrounding environment.

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Goblins like children.



goblins

goblin (plural) = goblin + s

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About Language

Language is a complex system of knowledge that all children learn by listening to native speakers in their surrounding environment.

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Don't goblins like children?

Goblins like children.



goblins

goblin (plural) = goblin + s

gob lins

g a b l i n z

Some Terminology

Phonology: sounds and sound system of the language

g a b l i n z gob lins

Lexicon: Words and associated knowledge (word forms, word meanings, etc.)

goblins =
(not koblins)



Morphology: system for combining units of meaning together
(goblin + [plural] = goblins)

Some Terminology

Syntax: system for combining words into sentences

Goblins like children.



Pragmatics: knowledge of language use

Don't goblins like children?

(expresses prior belief that goblins do like children)
Use this question form if you have this prior belief

Kids Do Amazing Things

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



...when kids can't tie their own shoes
or reliably recognize "4".

What kids are doing: extracting patterns and making generalizations from the surrounding data mostly without explicit instruction. They usually only get examples of what's allowable in the language, rather than explicit instruction about what's allowable.

"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.

Here's another one:



What about this one?

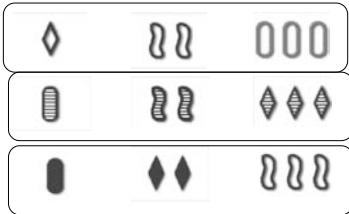
- ~~Set = all shapes, fills, and number of items the same?~~
- ~~Set = all shapes and fills the same?~~
- Set = all fills the same?

A learning analogy: Set



Task: Find Sets.

Are these Sets?

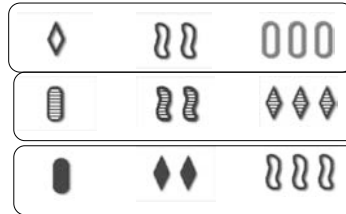


A learning analogy: Set



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?



✓

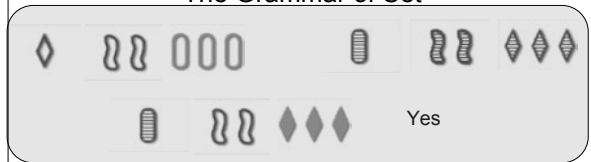


✓

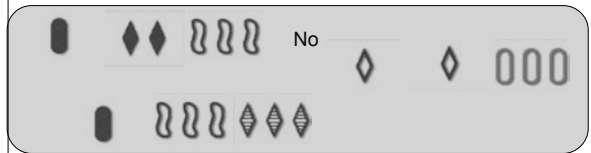


X We need a different generalization...

The Grammar of Set



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.



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 (misleading examples in the input).

Noise Analogy: "All these are Sets."

noise



not really a set
but presented to
child as if it were

Knowledge of Language & Hidden Rules

Some examples from language:

You know that...

...*strop* is a possible word of English, while *stvop* 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...

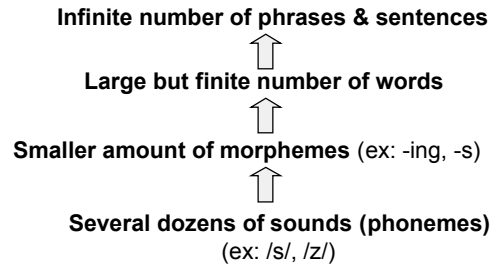
...the 's' in 'cats' sounds different from the 's' in goblins

cats: 's' = /s/

goblins: 's' = /z/



Linguistic Productivity Means We Need Rules



Phonemes

Basic perceptual units of which speech is composed
(Liberman, 1970)

Units that are used to build morphemes

Languages have a finite inventory of these units.

They are not units of meaning.

They are contrastive: changing a phoneme can change meaning (pig vs big).

Structure permits creativity

We are capable of combining existing phonemes to form new words

- "email", "IM", "xerox"
- Also, screennames!



Morphemes

Morphemes are the smallest meaningful units of language

Free morphemes may stand alone
mail, movie, sensation, mother

Bound (usually grammatical) morphemes cannot
ing, -s, -ed

Morphemes combine to form the words of a language.
Ex: He's a regifter! (re + gift +er)

Combination is rule-governed: "Regifter" is okay but not
*Reergift, *Erregift, *Ergifre, *Gifterre, *giftreer.

Structure permits creativity

We are capable of combining existing morphemes using existing morphological rules

- COMPOUNDING
e + mail, goblin + king, fantasy + movie + watcher
- DERIVATIONAL
re + gift, sensation + al
- INFLECTIONAL
sing → singing, sings

Compounding

mother
grandmother
great-grandmother
great-great-grandmother
great-great-great-grandmother
...

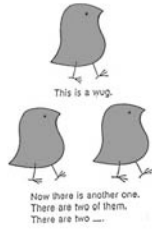


Derivational Morphemes

sensation
sensational
sensationalize
sensationalization
sensationalizational
sensationalizationalize

Inflectional Morphemes

The Wug Test



Structure permits creativity

We are capable of combining existing morphemes/words into new sentences



I know what I believe. I will continue to articulate what I believe and what I believe - I believe what I believe is right.

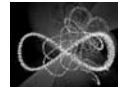
Linguistic Productivity Means We Need Rules

"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 the 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

The argument for mental grammar

"In short, in order for us to be able to speak and understand novel sentences, we have to store in our heads not just the words of our language but also the patterns of sentences possible in our language. These patterns, in turn, describe not just patterns of *words* but also patterns of *patterns*. Linguists refer to these patterns as the *rules* of language stored in memory; they refer to the rules as the *mental grammar* of the language, or *grammar* for short." - Jackendoff (1994)



Questions?

