

# Today's agenda

- Submit HW5 now!
- Arguments for Universal Grammar (cont'd)
- Review for the Final Exam & Exercises
- Course evaluation

# Arguments for Universal Grammar

- What were they? Recall from yesterday's lecture / readings...

# Home Sign

- Goldin-Meadow & Mylander 1990
- 10 deaf children born to hearing parents
- not exposed to sign language
- not making progress with oral speech

# Home Sign

- development of gestural, symbolic system of communication
- parallels normal linguistic development (up to a point)

# Home Sign

limited system

- mainly stayed at 2-word stage
- no recursion
- no abstract connectives (*before, because, etc.*)

# Home Sign

What developed:

- vocabulary (lexicon)
- consistent word order
- verbal inflections (spatial as in ASL)

# Home Sign

## Characterization of the input (mothers' utterances)

- smaller vocab (1/3 of child's)
- fewer strings of gestures
- not reliable word order
- more complex utterances later than children

# Home Sign

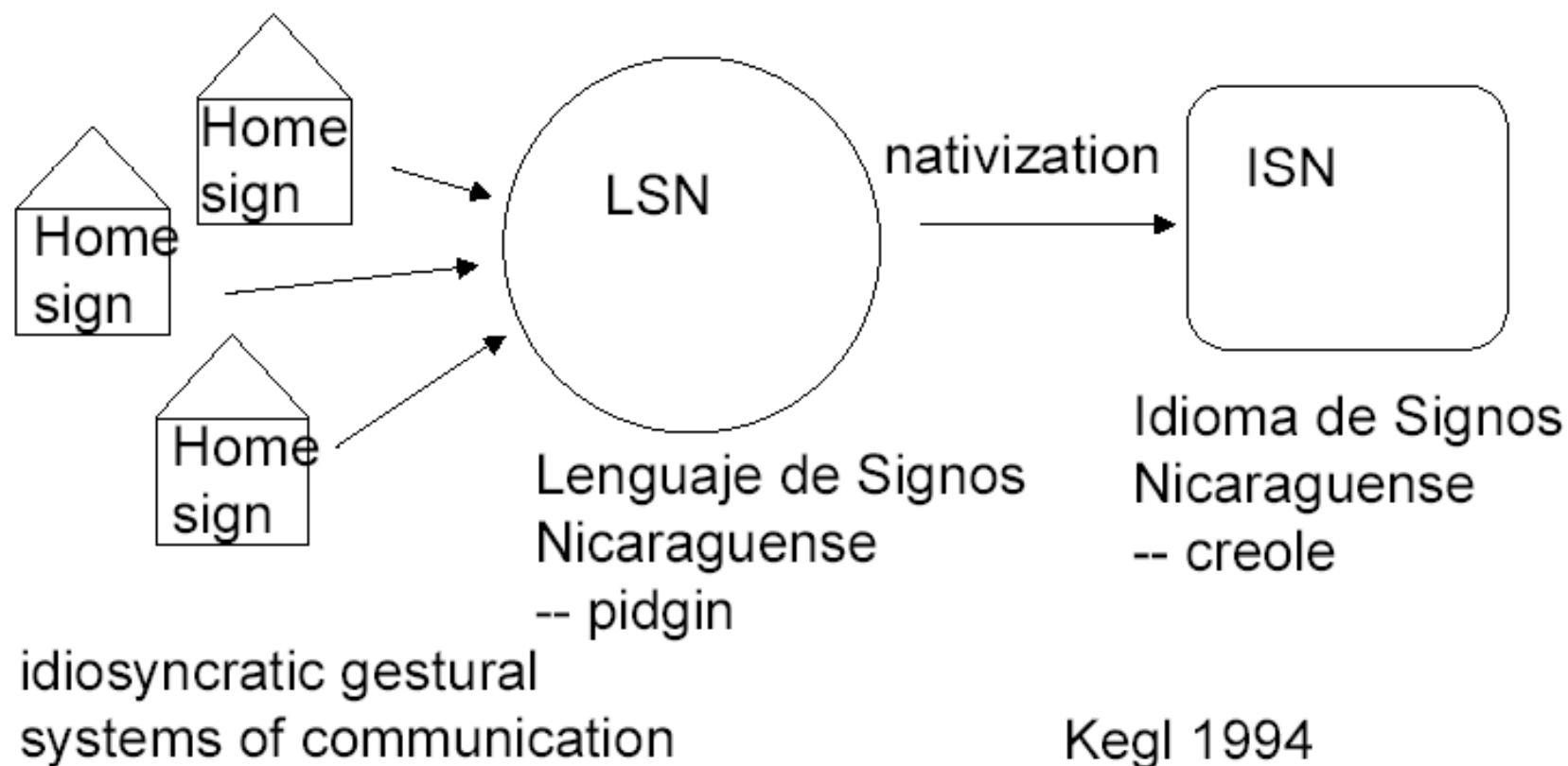
## Conclusion

- children had more elaborate and consistent grammar than parents
- children construct mental grammar (from underdetermined input)
  - caveat: why didn't their language have recursion/transformation though?

# Nicaraguan Sign Language



# NSL development



# Nicaraguan Sign Language

- creolization with no parallel language input
- all children of hearing parents, no signing adults
- not taught a signed language in school (teachers only taught spanish lipreading and fingerspelling)
- rudimentary system develops from children playing, interacting on school grounds

- Homesign
  - Gestures => structured symbolic communication system
- Pidginization
- Creolization
  - pidgin (no syntax) => full-fledged language

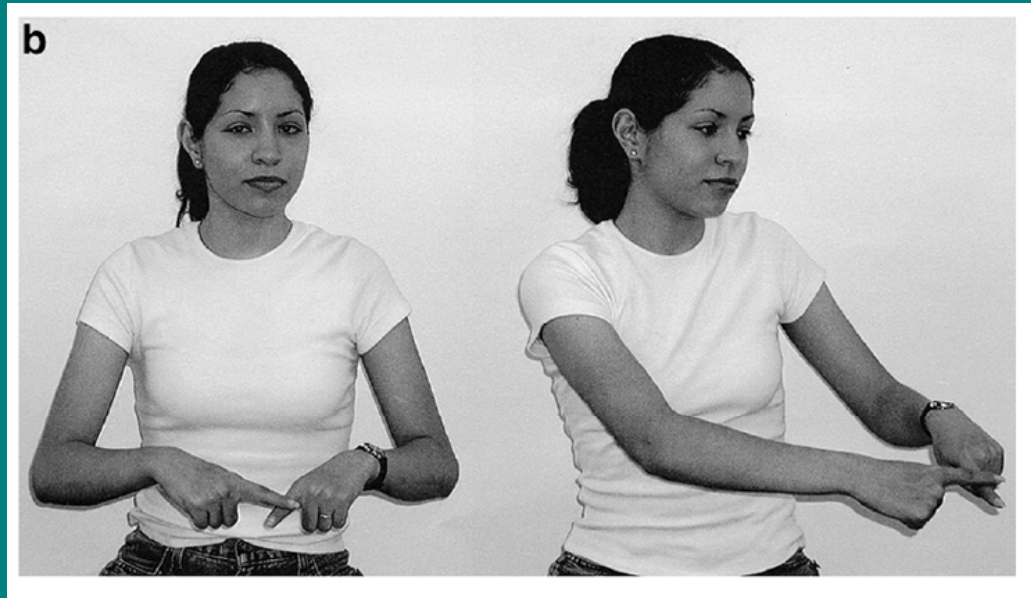
Why can't a full-fledged language develop in one generation?

# Hypothesis

- the time required to develop a language (“from scratch”) exceeds the critical period

# Spatial Modulations in NSL

- Senghas & Coppola
- spatial modulations develop as a means of marking agreement



# Participants

- Cohort 1: entered school pre-1983
- Cohort 2: entered school post-1983
- Within each cohort, divided by age of exposure
  - early: before 6 years old
  - middle: 6-10 years old
  - late: after 10 years old

# Results

- Early and middle-exposure participants in 2nd cohort use spatial modulations to signal verb agreement

# Results

- Evidence for **critical period**
- Evidence that **children create patterns** rather than just reproducing what they find in the input
- Evidence for **innate knowledge**

# Summary: Poverty of the Stimulus

- every child constructs a grammar (a set of rules) based on insufficient evidence
- More comes out than went in!
- trace back to UG

# Summary

Hypotheses:

1.  $\emptyset + \text{input} \Rightarrow \text{grammar}$  NO
2. LAD +  $\emptyset \Rightarrow \text{grammar}$  NO
3. LAD + input  $\Rightarrow \text{grammar}$  YES

# Open Questions

- How do features like recursion develop in the origin and evolution of language?

# Open Questions

- What is the critical period?
- Why can children learn language better than adults?
- due to innate knowledge of language structure? OR
- due to heightened natural capacity to notice patterns in the environment?

What about chimps?

# Do Chimps have UG?

## Issues

- signed language vs. vocal

# Previous Studies

**Washoe** (Allen & Beatrice Gardner 1960s)

- simplified ASL-like signs
- 5 years: 132 signs (including signs they made up)
- combinations:
  - *dirty Roger*
  - *water bird = swan*



# Washoe

- syntax?

Susan: WHO SMART?

Washoe: SMART WASHOE

Susan: WHO STUPID?

Washoe: SUSAN STUPID

No fixed word order

# Nim

- Raised in human setting from infancy to 4 years (Terrace)



# Do chimps have UG?

Nim

Results

- precocious in many ways
- learned words (symbolic representations for objects and events)
- 4 years: 125 signs
- produces 2-3-4 word utterances

# Nim

## Results (3 signs)

Apple me eat

Drink me eat

Eat Nim me

Nut Nim nut

Tickle me eat

Grape eat Nim

# Nim

## Results (4 signs)

banana Nim banana Nim

Eat drink eat drink

Grape eat Nim eat

Eat me Nim drink

Me Nim eat me

Tickle me Nim play

# Nim Results

- Nim's longest sequence:

*give orange me give eat orange me  
orange give me eat orange give me you*

# Do chimps have UG?

## Nim

## Results

- how was Nim's development similar to or different from human children's development of language?
- syntax?

# Nim

## Results

- no systematic word order
- cases of correct word order are often repetitions of what teacher had just said
- longer utterances involve repetitions of same words
- Also, the vocab size learned in 4 years is much smaller than that of human 4-year-olds (no vocab spurt seen in human children)

# Nim: Criticisms of experiment?

- should be raised with ASL spoken in household by native speakers
- even better: test off-spring of ASL-trained mother chimp
- have cohort group all exposed to ASL
- more emphasis on testing comprehension rather than production

## But even so,

- pretty clear difference between children and chimps
- Argument for innate Universal Grammar?
- species specificity
- cf. Kanzi (bonobo) studied by Savage-Rumbaugh

Summing up everything...

*Linguistics as cognitive science:  
the scientific study of human  
language*

But why study Language?

# Cognitive Science

- *What is the nature of the human mind?*
- *How is knowledge represented?*
- *How is knowledge acquired?*
- *What is the balance between nature and nurture?*

# Language

- universality
- distinguishing feature between humans and other animals

So, what is Language like?

# Properties of Human Language

- creativity (expressivity)

# Creativity

- Make up a sentence that you think no one has ever said before in the history of the universe. Write it down.

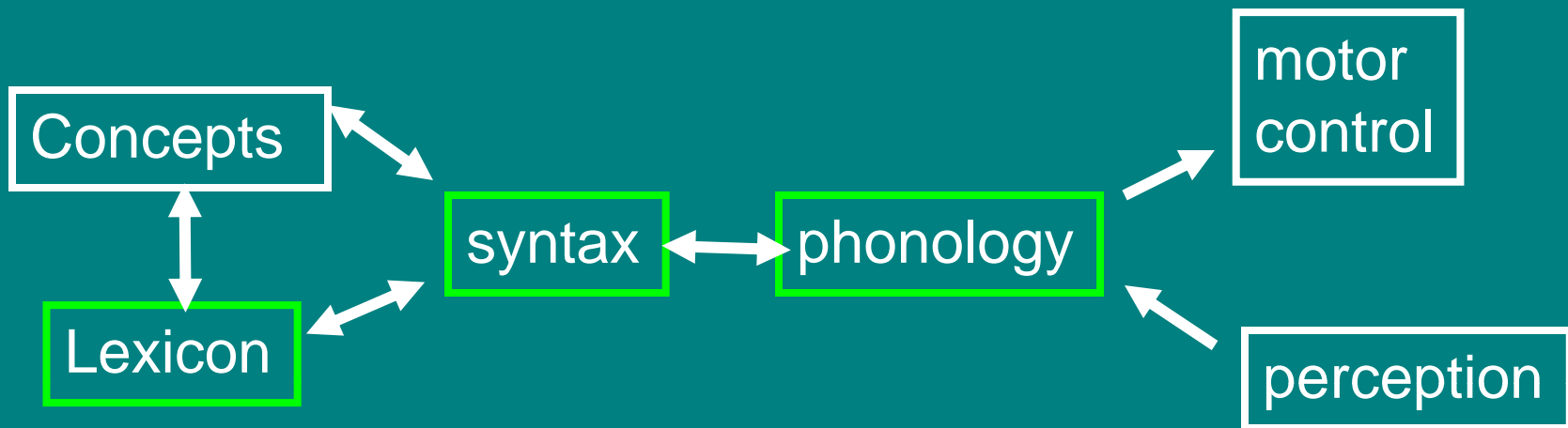
# Creativity

1. *That blue shirt looks like a shiny pink toaster.*
2. *Candied squid on a stick is a scrumptious delicacy to eat on my yacht.*
3. *I love waking up at 6am to take a final.*
4. *\*The wearily traveler early stopped tea some for.*

# Creativity

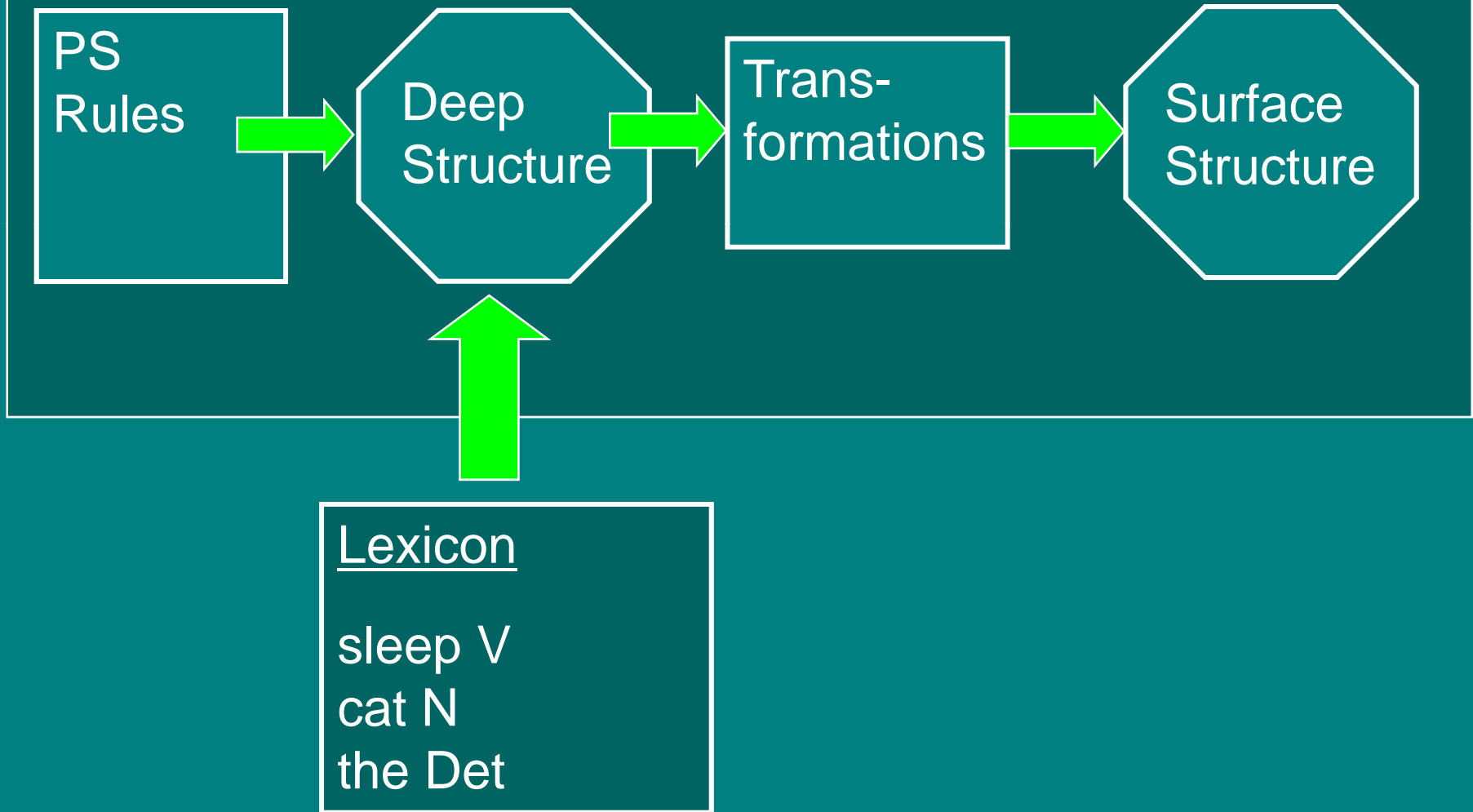
- sentences are not memorized
- sentences conform to rules
- infinite use of finite means (Wundt, Chomsky)

=> Mental Grammar



# The Grammar

# Generative Syntax



# Properties of Human Language

- creativity (expressivity)
- discrete, combinatory system
- hierarchical structure
- recursion
- PS rules & Transformations
- Constraints on transformations (e.g., island constraints, structure dependence)

# Properties of Human Language

- Phonology: segments combine to form (syllables &) words
- Rules modify sounds

## *The apple fell from the tree*

- Why does the subject precede the verb?
- Why is the vowel in “from” nasalized?

due to physical facts about the world?

due to physical facts about the human motor system?

⇒ purely internal to the grammar

⇒ facts about the grammar of English

# Conclusion 1

- **mental grammar**: specialized module containing a set of grammatical principles/rules
- accounts for set of patterns in language

# How did we come to know this set of patterns?

- patterns exist in the primary linguistic data (English)
- but patterns are compatible with infinite number of systems
- each child builds own system
- every child's system is the same



# English Input



Poverty of the Stimulus

structure dependence  
island constraint



Universal Grammar



Species specificity

## Conclusion 2

- innate knowledge: the human brain contains a genetically-determined specialization for language

# What are some of the innate principles in UG?

- set of possible speech sounds
- articulatory features
- structure dependence
- locality restrictions (islands)
- constraints on word learning (whole object principle)
- Others?

# Consequences of Chomskian linguistic theories

- Before Chomsky – mere descriptions of sounds and constructions; no concept of ‘mental’ component of language
- Chomsky 1957: mental grammar & innateness; linguistics as a study of this cognitive module (cognitive science)
- scientific study of language – hypothesis testing on the properties of mental grammar

# Discussion Question 1

- Imagine you're on a plane, and the person next to you asks what you learned in this linguistics course.
- How would you explain the main ideas you learned in class? Use some of the arguments we discussed in class, and explain them in your own words (without using too many technical terms)

## Discussion Question 2

- Are you convinced that humans have a mental grammar?
- Are you convinced that there is a biological foundation for language?
- Which arguments for mental grammar/innateness did you find convincing/unconvincing?

## Discussion Question 3

- There are many things we didn't cover in this class – what would you like to have learned more about?

# Linguistics courses at UMD

- syntax 1, 2
- phonology 1, 2
- grammar and meaning (semantics)
- child language
- undergrad seminars (psycholinguistics, advanced syntax, abnormal language acquisition, L2 acquisition, etc)
- Related courses in HESP, School of languages, etc

# Linguistics experience at UMD

- Directed studies (being a research assistant)
- participating in linguistic experiments

# Linguistics books

- Reading while being an undergrad is important!
- There are many linguistics books / journal articles you can read at this stage... If you have particular interests, let me know and I can give you some references

# Recommended book

