Structural Relations

- Represent the way in which speakers group words in their heads
- Explain word-order regularities
- Framework for creativity
- Built from information in the mental dictionary

Structural Relations

When is *anything* possible in English?

Similar terms: *any, anybody, ever, a damn thing, lift a finger, a rat’s ass*

‘Negative Polarity Items’

g. *Anybody read nothing.

h. *A person who has nothing pleases anybody.

i. *Because nobody came, anybody left.

j. *After the president said nothing, the media said anything.

c-command

A node c-commands only its sister(s), and any nodes contained inside its sister(s)
Structural Relations

A node c-commands only its sister(s), and any nodes contained inside its sister(s).

Negative expression c-commands anything: sentence is ok.

Negative expression does not c-command anything: sentence is bad.

Negative Polarity Items, e.g. any, must be c-commanded by a negative element.

A Constraint on Interpretation

John thinks that he is a great cook

He thinks that John is a great cook

When can a pronoun and a name refer to the same person?
A Constraint on Interpretation

a. While John was reading the book, he ate an apple
b. While he was reading the book, John ate an apple
c. John ate an apple while he was reading the book
d. He ate an apple while John was reading the book

‘Condition C’

- A name cannot be c-commanded by a pronoun that co-refers with it

A Constraint on Interpretation

While John was reading the book, he ate the apple

A Constraint on Interpretation

While he was reading the book, John ate the apple

A Constraint on Interpretation

John ate the apple while he was reading the book

A Constraint on Interpretation

He ate the apple while John was reading the book
A Constraint on Interpretation

- A pronoun can’t c-command a name that co-refers with it
- ‘Principle C’ (Chomsky 1981)

Principle C in Other Languages

Mohawk
Native American language, Quebec & upstate New York

- Free Word Order:
  - Sak
  - ra-nihwe’s
  - MsS-like-hab
  - ‘Sak likes her dress.’

- Omission of arguments:
  - ra-nihwe’s
  - MsS-like-hab
  - ‘He likes it.’
Principle C in Other Languages

Mohawk
Native American language, Quebec & upstate New York

• Discontinuous constituents

Ne kíke wa-hi-ýéná-’ ne kwéskwes
This fact-1sMsO-punc pig
'I caught this pig.'

Principle C in Other Languages

Mohawk
Native American language, Quebec & upstate New York

Condition C Effects

• Wa-ho-nakuni-’ tsí Sak wa-hi-hrewaht-e
That fact-NsMsO-anger-punc that Sake fact-1sMsO-punish-punc
'That I punished Sake, made him, mad.' (coreference possible)

• Wa-shako-hrori-’ tsí Sak wa-hi-hrewaht-e
He fact-MsFsO-tell-punc that Sake fact-1sMsO-punish-punc
'He told her that I punished Sake.' (coreference impossible)

Language Acquisition

a. While he was reading the book, Pooh ate an apple
b. *He ate an apple while Pooh was reading the book

• How could a child ever learn that Principle C applies?
• In a language like Mohawk, its effects are quite obscure
• Why does Principle C apply in every language?

Language Acquisition

a. While he was reading the book, Pooh ate an apple
b. *He ate an apple while Pooh was reading the book

• Universal Principles may not need to be learned - they may be part of the child’s innate knowledge of language
• This would explain why the principle is universal
• It would also set aside the language acquisition problem
• ...but it also predicts that young children should know constraints like Principle C

Language Acquisition

• Young children never say sentences like this, and probably almost never hear them
• Question: what meanings do children allow?
• Strategy: set up a situation in which the relevant meaning is present -- can a child associate that meaning with the relevant sentence?
• Truth Value Judgment Task

Center for Young Children (North Campus)
Truth Value Judgment Task

“Hello, Eeyore! I see that you’re reading a book.”

“What a fine-looking apple.”

“No, Pooh. You can’t eat the apple - that’s my apple.”

“Ok, I’ll have to eat a banana instead.”

“Ok, Pooh. I’ve finished reading. Now you can read the book.”

Principle C in children:
English - Crain & McKee (1985)
Russian - Kazanina & Phillips (2001), etc.
"Great. Now that Pooh is reading the book, I can eat this delicious apple."

"I shouldn’t be such a greedy donkey - I should let Pooh eat the apple."

"I suppose I have to eat a banana instead."

"Here you are, Pooh. You can have the apple."

"Oh, I’m such a lucky bear! I can read the book, and I can eat the apple, at the same time."

Apple is eaten up.
OK, that was a story about Eeyore and Winnie-the-Pooh. First Eeyore was reading the book and then Winnie-the-Pooh was reading the book. I know one thing that happened...

While Pooh was reading the book, he ate the apple.

While he was reading the book, Pooh ate the apple.

Pooh ate the apple while he was reading the book.

He ate the apple while Pooh was reading the book.

How 3-4 Year Olds Perform

a. While Pooh was reading the book, he ate an apple → yes!
b. While he was reading the book, Pooh ate an apple → yes!
c. Pooh ate an apple while he was reading the book → yes!
d. He ate an apple while Pooh was reading the book → no!

Works for English, Italian, Russian etc.

How the Task Works

• Child is not being judged
• Identical story for all test sentences
• Avoids child’s ‘yes’ bias - child shows knowledge by answering “no”
• Story favors the ungrammatical meaning
• Story is set up to make “no” answer felicitous
How the Task Works

- Child is not being judged
  - child understands that (s)he is helping the experimenter to test a puppet (e.g. Kermit)
  - child does not feel that (s)he is being tested, and so feels under less pressure
  - child’s response is very simple yes/no

- Identical story for all test sentences
  - only difference is in the final sentence that Kermit utters
  - if children respond differently to the different test sentences, this can’t be due to any differences in the stories

OK, that was a story about Eeyore and Winnie-the-Pooh. First Eeyore was reading the book and then Winnie-the-Pooh was reading the book. I know one thing that happened...

He ate the apple while Pooh was reading the book.
How the Task Works

• Child is not being judged
• Identical story for all test sentences
• Avoids child’s ‘yes’ bias - child shows knowledge by answering “no”
• Story favors the ungrammatical meaning
• Story is set up to make “no” answer felicitous

Plausible Denial

He ate the apple while Pooh was reading the book.

TRUE - but ungrammatical

He ate the apple while Pooh was reading the book.

Eeyore
Grammatical - but FALSE
clearly FALSE, since it almost happened, but then didn’t

A Constraint on Interpretation

John thinks that he is a great cook

He thinks that John is a great cook

“Great. Now that Pooh is reading the book, I can eat this delicious apple.”

“I shouldn’t be such a greedy donkey - I should let Pooh eat the apple.”
He thinks that John is a great cook.

Pictures from Jumping Contest

story removed - too large!

Available as a separate file

Younger children…

Principle C in 30-month olds

Cynthia Lukyanenko, Anastasia Conroy and Jeffrey Lisz

University of Maryland

Presented at Cornell Undergraduate Linguistics Conference, March 2007

The Children…

• 25 children: 13 boys, 8 girls
• Age range: 28-32 months
• Mean age: 30.8
• Mean vocabulary size: 434 words
Controls

- Various factors counterbalanced
  - Verbs used in Principle C tests and in the reflexive tests ("Katie’s patting herself")
  - Character that performed the action
  - First action in the familiarization portion
  - Left/right position of the ‘correct’ display
  - Order of the verbs

Interim Conclusion

- Structural relations such as c-command can explain a variety of syntactic constraints
- …including some constraints which may apply across all languages of the world
- Universal constraints may not need to be learned
- Children know ‘Principle C’ before age 3, i.e. as early as it has been possible to test

How well does this Generalize?

- ‘Principle C’ is clearly just one example of a syntactic constraint that a child must master
- The logic of this case should apply to other universals
- Many questions remain about whether this expectation is confirmed: task involves
  - (i) identifying universals
  - (ii) verifying early mastery
- Truth Value Judgment Task is suitable for testing some, but by no means all aspects of syntactic knowledge
  - best for testing constraints on interpretation

What Children Must Learn

- Children must learn things that differ across languages
  - word order (SVO, SOV, etc.)
  - morphology
  - Preposition-stranding
    - English: Who did he talk with ___?
    - French: *Qui a-t-il parlé avec ___?
    - Spanish: *Quién ha hablado con ___?
Easy vs. Hard to Observe

- Not all aspects of syntax are equally easy to observe
- Some constructions occur more frequently than others
- It is easier to notice that something does occur, than to notice that it does not occur
- Need to guarantee that all children will successfully master their language!

Definitely Hard to Observe

a. While Pooh was reading the book, he ate an apple
b. While he was reading the book, Pooh ate an apple
c. Pooh ate an apple while he was reading the book

- It’s a good thing that it’s a Universal constraint!

d. He ate an apple while Pooh was reading the book

Probably Hard to Observe

Who do they think that Susan likes

Who do they think that

Who do they think that

Who do they think that

- Complementizer that is optional

that-gap Constraint

- Who do they think that likes Richard?
- English *
- French *
- Italian ok
- Spanish ok
- Levantine Arabic *
- Beni-Hassan Arabic ok

Parameters

- Life is easier for the learner if hard-to-observe properties can be linked to easy-to-observe properties
- This leads to a search for groups of syntactic properties that always occur together in a language
- Parameters
Subject Positions

- *that-gap* sequences
  - English: no
  - French: no
  - Italian: yes
  - Spanish: yes
  - Levantine Ar.: no
  - Beni-Hassan Ar.: yes

- Post-verbal subject
  - English: no
  - French: no
  - Italian: yes
  - Spanish: yes
  - Levantine Ar.: no
  - Beni-Hassan Ar.: yes

*Who did they say that likes Bill?* *Has telephoned John*

Why the Connection?

<table>
<thead>
<tr>
<th>Language with Postverbal Subjects</th>
<th>Language without Postverbal Subjects</th>
</tr>
</thead>
</table>
| Who do they think that Susan likes? | Who do they think that Richard likes?
| Who do they think that John likes Richard? | Who do they think that Bill likes Susan? |

Why the Connection?

- If a language allows post-verbal subjects, then it also allows *that-gap* sequences
- Post-verbal subjects are easy-to-observe
- Good news for the learner!

Why the Connection?

- *that-gap* Constraint
- *Postverbal Subjects*

Schematic of ‘Parameters’

- Hard
- Easy
- The hope is that every obscure fact is linked to an easily observed fact

Principles & Parameters

- An attempt to minimize the amount that a child must learn
- Principles (i.e. Universals) --> Innate
- Parameters (i.e. sets of properties which vary together) --> Only one property per set to learn
- Remains to be confirmed
Outlook

• Study of language structure and language learning are closely related … obviously
• Our unconscious knowledge of syntax can appear dauntingly complex … hence hard to learn
• The learner’s task can look rather different once we consider cross-language uniformity & variation
• Universals may not need to be learned at all
• Where complex obscure properties are systematically linked to easy-to-observe properties, learning gets easier
• …this is work in progress…