

#2 - Incremental Grammar Background and Evidence

I. Prerequisites for Unified System

#1: Incremental grammar

Since perception and production of language involve a system that is *prima facie* incremental, grammar must also be incremental, or at least allow incremental use.

#2: Specific processes of grammar should find counterparts in production & perception

For example, transformational operations posited for explaining grammaticality facts should find counterpart as operations in perception and production.

#3: No domain-specific linguistic principles for perception and production

E.g., no specific structural complexity metrics for ambiguity resolution in comprehension

#4: No genuine dissociations of production/perception/grammar in language breakdown

Any dissociations between performance on grammatical/comprehension/production tasks in language breakdown must be artifacts of non-linguistic differences between the tasks: e.g. production is more open-ended than perception; grammaticality judgments (may be) less demanding than interpretation tasks.

#5: Analysis-by-synthesis – knowledge-that *is* knowledge-how, e.g. determining grammaticality involves running through steps involved in perceiving sentence.

Theory should incorporate explicit model of how speakers perform grammaticality judgments: process must be extremely close to process of perceiving or producing a sentence.

#6: Account of comprehensible-yet-ungrammatical sentences required

Need account of sentences that are understandable yet easily identified as ungrammatical. (Opposite cases, in which sentences are grammatical yet incomprehensible, are easy to accommodate, under the assumption that grammaticality is just parsability in the limit.)

II. Syntactic Background

A. Constituency

---see additional handout---

B. Complex VP Structures

- | | | | |
|-----|----|-----------------------------|------------------------------|
| (1) | a. | I gave John a book | [double object construction] |
| | b. | I denied Fred his pay | |
| | c. | Elmer baked Hortense a cake | [benefactive] |

- d. anyani a-ku-phwany-ir-a mwala dengu [instrumental; Chichewa]
baboons SP-prs-break-appl-fv stone basket
“The baboons are breaking the basket with a stone”
- (2) a. I gave a book to John [dative]
b. Elmer baked a cake for Hortense
- Coordination: two objects show constituent-like behavior
- (3) a. John gave [Mary a pair of socks] and [Bill a bunch of flowers]
b. John gave [a pair of socks to Mary] and [a bunch of flowers to Bill]
- (4) a. Erika baked [Matthew a cake] and [Kevin a loaf of bread]
b. Erika baked [a cake for Matthew] and [a loaf of bread for Kevin]
- Binding (etc.) asymmetries: first object c-commands second on many standard tests
- (5) a. Mary likes herself [anaphor binding]
b. * Herself likes Mary
- c. I showed Mary herself
d. * I showed herself Mary
- (6) a. Every Englishman loves his mother [variable binding]
b. * His mother loves every Englishman
- c. The Free Trade Agreement denied each worker his job
d. * I showed its trainer every lion_i
- (7) a. Nobody said anything. [negative polarity licensing]
b. * Anything occurred to nobody.
- c. I told nobody anything.
d. * I told anybody nothing.
- (8) a. Each linguist hated the other’s theory. [each...other]
b. * The other hated each linguist’s theory.
- c. I showed each man the other’s socks.
d. *I showedthe other each man’s socks.

[Additional constructions showing same asymmetry: Weak Crossover, Superiority]

- Asymmetries in idiom chunks

(9) **Verb+Object**

- a. Aunt Agatha kicked the bucket.
b. Emily and Rosalind threw a party.
c. Hit the road, Jack!
d. Frank called my bluff.
e. Playing hookie/truant beats going to class.
f. The Red Sox threw in the towel.

(10) **Verb+Subject**

???

- Explanation (Marantz 1981): Idioms must be D-structure constituents.

(11) **Verb+Indirect Object**

- a. Lasorda sent his starting pitcher to the showers
- b. Mary took Felix to the cleaners
- c. Mary took Felix to task
- d. Mary took Felix into consideration
- e. Felix threw Priscilla to the wolves
- f. Max carries such behaviour to extremes

(12) **Verb+Direct Object**

???

- By parity of reasoning: V+IO must be an underlying constituent.

Note:

- (13)
- a. * Lasorda sent the showers his starting pitcher
 - b. * Mary took the cleaners Felix
 - c. * Felix threw the wolves Priscilla

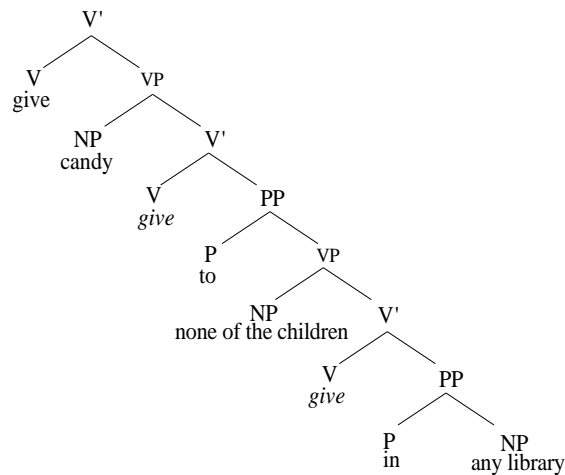
- Arguments for right-branching structure extend to adverbial phrases, too

(14) John gives candy to children in libraries on weekends

- (15)
- a. John gave **nothing** to **any** of my children in the library on his birthday.
 - b. John gave candy to **none** of my children in **any** library on his birthday.
 - c. John gave candy to children in **no** library on **any** public holiday.
 - d. * John gave **anything** to **none** of my children in the library on his birthday.
 - e. * John gave candy to **any** of my children in **no** library on his birthday.

- (16)
- a. John gives [candy to children on weekends] and [money to homeless people on weekdays.]
 - b. John gives money [to children on weekends] and [to homeless people on weekdays.]
 - c. John gives candy to [children on weekends] and [homeless people on weekdays.]

(17)

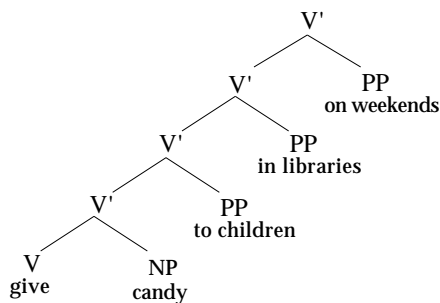


- But these results are at odds with well known results on movement and ellipsis in complex VPs

- (18) a. John intended to give candy to children in libraries on weekends,
... and [give candy to children in libraries on weekends] he did ____.
- b. John intended to give candy to children in libraries,
... and [give candy to children in libraries] he did ____ on weekends.
- c. John intended to give candy to children,
... and [give candy to children] he did ____ in libraries on weekends.
- d. ... and [give candy] he did ____ to children in libraries on weekends.
- e. * ...and [to children in libraries] he did ____ give candy on weekends.
- f. * ...and [in libraries on weekends] he did ____ give candy to children.

- (19) a. John gives candy to children in libraries on weekends, and Mary does (too).
b. John gives candy to children in libraries on weekends and Mary does on federal holidays.
c. John gives candy to children in libraries on weekends and Mary does in urban parks on federal holidays.

(19)



C. Bare Phrase Structure/Minimalist Program

Minimalist Program (Chomsky 1993, 1995a, 1995b) responds to various concerns:

- (i) Uniformity of languages

Suggestion that a number of differences across languages may be reduced to the idea that operations which are overt in some languages may be covert in other languages.

Technical implementation: syntactic features as *weak* or *strong*

Relevant phenomena: overt/covert wh-movement (Huang 1982, Watanabe 1992, Richards 1997); overt/covert verb-raising (Emonds 1978, Pollock 1989, Chomsky 1991)

(ii) External constraints on language/grammar

Consideration of those properties of natural language syntax which may be a result of the simple fact that syntax specifies some connection between *sound* and *meaning*.

Technical implementation: constraints on *logical form* and *phonetic form*

Relevant phenomena: *full interpretation* (FI: Chomsky 1986); binding theory (Chomsky 1993, Culicover & Jackendoff 1995, 1997); cliticization and verb-second (Anderson 1993, Chomsky 1995b)

(iii) Foundations of Phrase Structure

Consideration of how much of standard phrase structure theory (X-bar theory, Structure Preservation Constraint etc.) follows from basic assumption that structures are built out of sets of lexical items. *Bare Phrase Structure* (Chomsky 1995) is substantially a reaction to Kayne's influential proposal (Kayne 1994) that various properties of standard X-bar theory are derived from a geometric constraint on *tree nodes*. Chomsky is essentially arguing that Kayne's technical proposal misses the even more basic fact that sentences are built out of sets of lexical items.

Technical implementation: ideally requires very little

Relevant phenomena: in theory - everything; in practice - turns on rather limited data; interesting consequences for elements showing simultaneous head-like and XP-like behavior, e.g. clitics.

(iv) Economy of Derivation and Representation

Suggestion that a structure or derivation may be ruled out because *something else is better*. Also leads to notion that movement happens only when it is *forced* to. Radical departure from standard government-binding view, in which *move alpha* applies entirely freely, and resulting structures are evaluated individually by constraints. Not so unfamiliar to 1960s view in which specific movement operations occur for specific reasons.

Requires notion of *reference set*: the set of structures/derivations which are competing, and which may consequently block each other.

Technical implementation: principles such as *Greed*, *Shortest Move*, *Minimal Link Condition*, *Last Resort*.

Sample phenomena handled in this manner: do-support (Chomsky 1991); superiority effects in wh-movement (Kitahara 1994); resumptive pronouns (Shlonsky 1992); quantifier scope (Fox 1995); head movement (Boskovic 1997, Cavar & Wilder 1994) ...to name but a few.

(v) Morphological basis of Cross-language Variation

Suggestion (reputed to originate in Borer 1984) that cross-language variation reduces to variation in morphological/lexical heads, possibly only functional categories.

Technical implementation: difficult to state differences *except* in terms of properties of specific heads.

Relevant phenomena: properties of simple vs. complex anaphors (Pica 1987); properties of simple vs. complex wh-expressions (Nishigauchi 1990; Cheng 1992); connection of agreement to verb-movement

(Rohrbacher 1994); morphology & grammatical function changing (Baker 1988); non-configurationality (Baker 1996) etc.

Remember: The various components of the Minimalist Program are not a 'package deal' -- they are related, but nevertheless independent.

X-bar Theory

I. Kayne's Proposal (Kayne 1994)

Simplified somewhat: if a non-terminal node X *asymmetrically c-commands* non-terminal node Y, then the terminals that X dominates precede the terminals that Y dominate.

Basic consequence: two heads may not be sisters

II. Chomsky's Proposal (Chomsky 1995)

(i) $X' \rightarrow X YP$

i.e. node above X is X', and sister is a maximal projection

if only one node of any pairing projects, and max/min is 'relational' (Muysken 1982), then fact that complements are XPs follows

fact that one of the nodes projects: this is at least very reasonable, though Chomsky tries to argue that it is the only coherent possibility.

combination of a + b could be {a, b} if labels absent or entirely predictable

with labels, $a + b = \{a, \{a, b\}\}$ or $\{b, \{a, b\}\}$, depending on which of a or b project

(ii) $XP \rightarrow X' ZP$

i.e. node above X' is XP, and sister is a maximal projection

again, relational definition of max/min ensures that sister of X' is ZP.

again, idea that one node projects is at least highly reasonable

(iii) $XP \rightarrow XP UP$

follows from relational view of projection that the highest projection of U is UP.

note: representation of adjunction as $\{ \langle a, a \rangle, \{a, b\} \}$ is based on somewhat theory internal considerations, e.g., desire to make adjuncts to XP neither 'inside' nor 'outside' XP for calculations of c-command (May 1985, Chomsky 1986)

(iv) one complement, one specifier, then adjuncts

does not follow

(v) highest and lowest projections of X (i.e. X^0 , XP) are visible to syntactic operations, others not

does not follow

(vi) Structure Preservation Constraint: Heads move to head positions, XPs move to XP positions (Emonds 1970)

Case-by-case examination

If an XP moves, and the target projects, it remains an XP
If an XP moves, and projects itself, it may cease to be an XP
If an X' moves and the target projects, it becomes an XP
If an X' moves and projects itself, it remains an X'
If an X moves and the target projects, it becomes an XP
If an X moves and projects itself, it may remain an X

Chain Uniformity Condition (14) more or less restipulates the SPH

Combination of CUC and relational interpretation of projection levels leads to problem for heads adjoining to heads: needs to be dealt with by another stipulation.

III. Linear Order and Constituency

---see additional handout---