慶應言語学コロキアム Zoom with a Minimalist View #2: Mamoru Saito's Work 2017-2018

[October 17, 2020]

*今日のタイムテーブル

	セッション	担当講師	取り上げる論文
13:30-14:15	[1]話題提供	大宗・石井	論文 1: "Transformations in the Quest for a Simpler, more Elegant Theory"
14:15-14:30	[1]質疑		
14:30-14:35	休憩		
14:35-15:20	[2]話題提供	北田・永盛	論文 2: "Ellipsis"
15:20-15:35	[2]質疑		
15:35-15:45	休憩		
15:45-17:00	全体討論		

*各トーク直後の質疑セッションでは、簡単なやり取りで済む内容に絞りましょう。

Saito, Mamoru (2018)

Transformations in the Quest for a Simpler, more Elegant Theory

October 17, 2020

Zoom with a Minimalist View #2

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Section 1:   Introduction

(A)   How are transformational rules motivated in *Syntactic Structures*?

(B)   How did the relevant discussion and proposals lead to the remarkable development of syntactic theory in the subsequent 60 years?

Roadmap

Section 2:   Inadequacy of phrase structure rules for discontinuous elements

Section 3:   Phrasal movements and selection

Section 4:   A minimalist perspective on transformations

Section 5:   Conclusion

American structuralism (cf. Harris 1951)

(i)   A discovery procedure

A manual of mechanical method to construct a grammar on the basis of a given corpus

(ii)   The separation of levels

Linguistic research should proceed in a bottom-up fashion, from phonemic analysis to morphology and then to syntax.

Generative grammar

    (i)   An evaluation procedure

        "The point of view adopted here is that it is unreasonable to demand of linguistic theory that it provide anything more than a practical evaluation procedure for grammars."

        (Chomsky 1957, p. 52)

        Cf.   Local maximum (Chomsky 1951)

    (ii)   Linguistic levels

        Pm, M, W, C, P, T   (Chomsky 1955)

Section 2: Inadequacy of Phrase Structure Rules for Discontinuous Elements

Section 2.1: English Auxiliary System

(1)   a.   *Sentence -> NP + VP*

       b.   *VP -> Verb + (NP)*

       c.   *NP -> (Art) + N*

       d.   *Art -> the*

       e.   *N -> man, ball, book,* etc.

       f.   *Verb -> hit, took*, etc.

          +: concatenation

          Context-free phrase structure grammar (Type 2)

              $A \to \omega$ ($A \in V_N$, $\omega \neq e$)   (Chomsky 1956)

(2)   Discontinuous elements

     The man had been reading the book.

        The perfect: *have + en*

        The progressive: *be + ing*

A transformational analysis (cf. Harris 1951)

(3)   a.   *Verb -> Aux + V*

       b.   *Aux -> Tense + (Modal) + (have + en) + (be + ing)*

       c.   *V -> hit, take, walk, read*, etc.

d.   *Tense -> past, present*

e.   *Modal -> will, can, may, shall, must*

(4)   a.   Affix hopping (phonological merger)

Let *Af* stand for any of the affixes *past, present, en, ing*.   Let *v* stand for any *Modal* or *V*, or *have* or *be* (i.e. for any non-affix in the phrase *Verb*.)   Then:

$Af + v \to v + Af\#$, where # is interpreted as word boundary.

b.   Insertion of word boundaries

Replace + by # except in the context *v _ Af*.   Insert # initially and finally.

(5)   Derivation of (2)

a.   *the + man + past + have + en + be + ing + read + the + book*

Affix hopping

b.   *the + man + have + past # be + en # read + ing # the + book*

Insertion of word boundaries

c.   *# the # man # have + past # be + en # read + ing # the # book #*

(6)   Morphophonemic rules

walk -> /wɔk/, take + past -> /tʊk/, have + past -> /hæd/, be + en -> /bɪn/, …

(7)   a.   *Verb -> V + Tense*

b.   *Verb -> Modal + Tense + V*

c.   *Verb -> have + Tense + V + en*

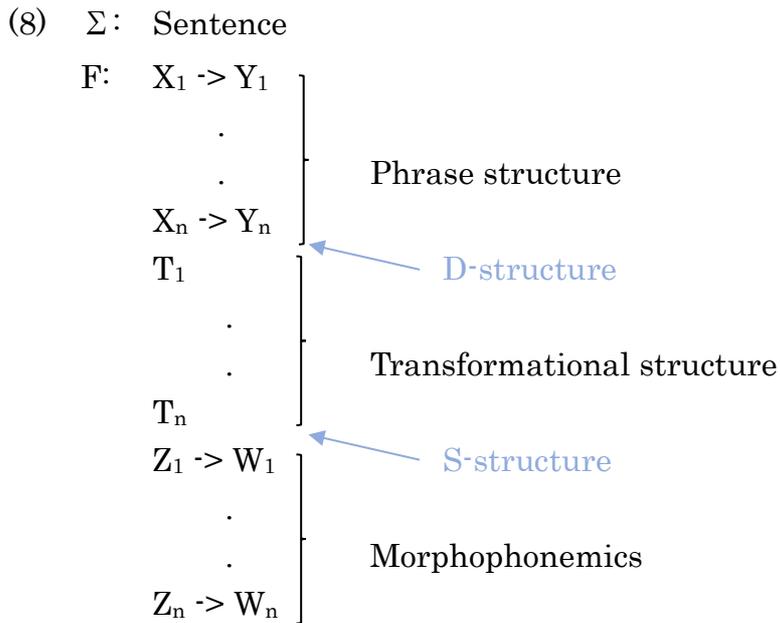d.   *Verb -> be + Tense + V + ing*

e.   *Verb -> Modal + Tense + have + V + en*

f.   *Verb -> Modal + Tense + be + V + ing*

g.   *Verb -> have + Tense + be + en + V + ing*

f.   *Verb -> Modal + Tense + have + be + en + V + ing*

4

(8) Σ: Sentence

F: X_1 -> Y_1

.

. Phrase structure

X_n -> Y_n

T_1 ← D-structure

.

. Transformational structure

T_n

Z_1 -> W_1 ← S-structure

.

. Morphophonemics

Z_n -> W_n

Section 2.2: The Generality of the Affix Hopping Analysis

Negative sentences

(9)   1   –   2   –   3

a.   *NP – Tense   – V …*

b.   *NP – Tense + Modal – …*

c.   *NP – Tense + have   – …*

d.   *NP – Tense + be   – …*

(10) a.   The man had not taken the book.

b.   The man was not taking the book.

(11) The derivation of (10a)

a.   *the + man + past + have + en + take + the + book*

Insertion of *not*

b.   *the + man + past + have + not + en + take + the + book*

Affix hopping

c.   *the + man + have + past # not + take + en # the + book*

Insertion of word boundaries

d.   *# the # man # have + past # not # take + en # the # book #*

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"Dummy verb" do

(12) The man did not take the book.

(13) The derivation of (12)
  a.   *the + man + past + take + the + book*

                Insertion of *not*

  b.   *the + man + past + not + take + the + book*

              Insertion of word boundaries

  c.   *#the# man# past# not# take# the# book#*

                do-support

  d.   *#the# man# do + past# not# take# the# book#*

(14) *Do*-support
    #Af -> #do + Af

Yes/No questions

(15) a.   Had the man taken the book?
    b.   Was the man taking the book?
    c.   Did the man take the book?

Question Transformation

    Front the second element in (9) to the sentence-initial position.

(16) The derivation of (15c)
  a.   *the + man + past + take + the + book*

              The question transformation

  b.   *past + the + man + take + the + book*

              Insertion of word boundaries

  c.   *# past# the# man# take# the# book#*

                do-support

  d.   *# do + past# the# man# take# the# book#*

Wh-questions

(17) a.   What did the man take?

     b.   Who took the book?

(18) The derivation of (17a)

     a.   *who + past + take + the + book*

             The question transformation

     b.   *past + who + take + the + book*

             The *wh*-fronting rule

     c.   *who + past + take + the + book*

             Affix-hopping

     d.   *who + take + past # the + book*

             Insertion of word boundaries

     e.   *# who # take + past # the # book #*

(19) a.   *Sentence -> Do + Tense + NP + VP₁*

     b.   *Sentence -> Modal + Tense + NP + VP₂*

     c.   *Sentence -> have + Tense + NP + VP₃*

     d.   *Sentence -> be + Tense + NP + VP₄*

(20) a.   *VP₁ -> Verb₁ + (NP)*

     b.   *Verb₁ -> V*

     c.   *VP₂ -> Verb₂ + (NP)*

     d.   *Verb₂ -> have + be + en + V + ing*

     e.   *Verb₂ -> have + V + en*

     f.   *Verb₂ -> be + V + ing*

     g.   *Verb₂ -> V*

     h.   *VP₃ -> Verb₃ + (NP)*

     i.   *Verb₃ -> be + en + V + ing*

     j.   *Verb₃ -> V + en*

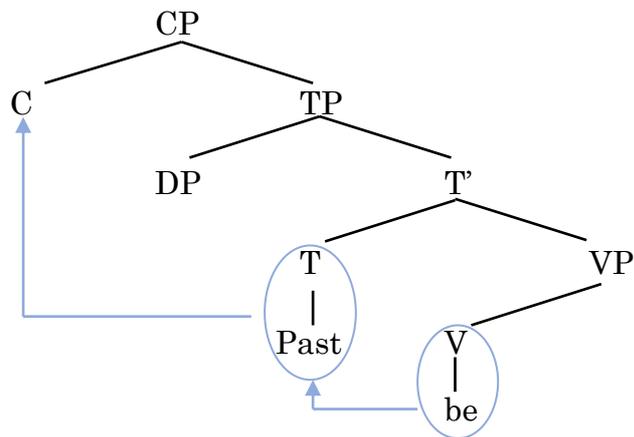   k.   *VP₄ -> Verb₄ + (NP)*

     l.   *Verb₄ -> V + ing*

Section 2.3: Refinements of the Analysis

(21) (=(9))

	1	–	2	–	3
a.	*NP*	–	*Tense*	–	*V* …
b.	*NP*	–	*Tense + Modal*	–	…
c.	*NP*	–	*Tense + have*	–	…
d.	*NP*	–	*Tense + be*	–	…

(22) Was the man taking the book?

(23) The derivation of (22) (=(15b))

Dialectal variations

(24) a. Have you the book?

b. Do you have a book?

(25) a. Are you comfortable?

b. * Do you be comfortable?

(26) French vs. English (Emonds 1978)

a. Jean (n') aime pas Marie.

  (ne) love Neg

b. John does not love Mary.

Discussions

Elimination of the distinction between IM and EM

I.   A unified formulation of phrase structure rules and transformations
    "A derivation involving only phrase structure rules (rewriting rules)
    has a strict "Markovian" character.   That is, in a derivation consisting
    of the successive lines $\sigma_1, \dots \sigma_n$ ($\sigma_1 = \#S\#$, $\sigma_n = \#\alpha_1 \dots \alpha_k\#$, where each α_i
    is a terminal or nonterminal symbol of the vocabulary on which the
    grammar is based), the rules that can be applied to form the next line
    σ_{n+1} is independent of $\sigma_1, \dots \sigma_{n-1}$ and depend completely on σ_n."

                                                                (Chomsky 1965, p. 89)

    "A grammatical transformation is, in other words, a rule that applies to
    Phrase markers rather than to strings in the terminal and
    nonterminal vocabulary of the grammar."   (Chomsky 1965, p. 89)

    $\varphi_1, \dots \varphi_n \rightarrow \psi$ (Chomsky and Miller 1963)
        Phrase structure rules: n = 1, φ, ψ: a string
        Transformations: n$\geq$1, $\varphi_1, \dots \varphi_n$, ψ: a set of strings
            A set of strings = Phrase markers like {S, NP-VP, Det-N-VP, …}

II. Both phrase structure rules and transformations apply to strings.
    A grammatical transformation T is defined on ordered pairs (Z, K),
    where
    (a) Z and $T(Z, K)$ are strings in $\overline{\text{P}}$.
    (b) K is a set of strings in P, and Z is a member of K.
    Thus T operates on a string Z of $\overline{\text{P}}$, with the analysis given by K, and
    produces a new string of $\overline{\text{P}}$ which we denote by "$T(Z, K)$."
                                                                (Chomsky 1975, p. 311)
    ($\overline{\text{P}}$ is the set of "lowest-level" strings in P.)

"Each grammatical transformation *T* operates on a string Z with the constituent interpretation K and converts it into a new string Z' with the derived interpretation K'."　　　　　(Chomsky 1975, p. 402)

"A grammatical transformation T operates on a given string with a given constituent structure and converts it into a new string with a new derived constituent structure."　　　　　(Chomsky 1957, p. 44)

Merge: the minimal operation required for Language takes two objects α, β and forms a constituent γ.

　　　$γ = \{ α, β \}$

III. Duality of semantics

"At the semantic interface, the two types of Merge correlate well with the duality of semantics that has been studied within generative grammar for almost 40 years, at first in terms of "deep and surface structure interpretation" (and of course with much earlier roots). To a large extent, EM yields generalized argument structure (theta-roles, the "cartographic" hierarchies, and similar properties); and IM yields discourse-related properties such as old information and specificity, along with scopal effects. The correlation is reasonably close, and perhaps would be found to be perfect if we understood enough."

　　　　　　　　　　　(Chomsky 2008, p. 140)

"The interpretive systems have got to know what's a copy and what's a repetition. ... I think the basic answer to it is given by a general property of language, which is sometimes called "duality of semantics". If you look quite generally at the interpretation of expressions, it falls into two categories. There is one category which yields argument structure (theta-roles and the interpretation of complements of functional elements). There is another category which is involved in displacement, which has kind of discourse-oriented or information-related properties or scopal properties and so on, but not argument

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properties. That's duality of semantics. If you think about it a little further, you see that the first type, argument structure, is invariably given by external MERGE. The second type, non-argument structure (other factors) is always given by internal MERGE."

(Chomsky 2019, p. 43-44)

"Now if you think about duality of semantics, you have a technique right away to determine what's a copy and what's a repetition.   If something is in a theta-position, it is not a copy (unless it's been raised, in which cases it's a copy of what's been raised). If it is a non-theta position, it is a copy. And at the phrase level, the system simply has to take a look and say what's in a theta-position, what isn't in a theta-position. That tells us what's a copy and what's a repetition."

(Chomsky 2019, p. 58)

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Transformations in the Quest for a Simpler, more Elegant Theory Section 3–4

Section 3: Phrasal Movement and Selection

Discussions on passive in *Syntactic Structures*   ➡️   The postulation of D-structure in the later works

Section 3.1: The Passive Transformation

(27)   The passive transformation:
If S_1 is a grammatical sentence of the form NP_1 — Aux — V — NP_2, then the corresponding string of the form NP_2 — Aux+be+en — V — by + NP_1 is also a grammatical sentence.

(28)   a. Sincerity frightens John.
(27), (29)
b. John is frightened by sincerity.

(29)   a. sincerity + present + frighten + John. (PS rule)
b. John + present + be + en + frighten + by + sincerity (Passive transformation)
c. John + be + present # frighten + en # by + sincerity (Affix hopping)
d. # John # be + present # frighten + en # by # sincerity # (Word boundary)

🤔 *Possibility (rejected): Introducing be + en as part of Aux in the PS rule*

(30)   Aux $\rightarrow$ Tense + (Modal) + (have + en) + (be + ing) *+ (be + en)*
Cf. (3b) Aux $\rightarrow$ Tense + (Modal) + (have + en) + (be + ing)

⚠️ *Heavy restriction must be placed on the selection of be + en: The following V must be transitive and at the same time the V cannot be followed by NP.*
☞ *This complicates the grammar.*

The argument of selectional relations is already presented in *Syntactic Structures* for the passive rule.

selection

(31)   a. # John frightens sincerity[-animate]. ↔ (28a): Sincerity frightens John[+animate].

b. # Sincerity[-animate] is frightened by John. ↔ (28b): John[+animate] is frightened by sincerity.

🤔 *Possibility (rejected): PS rule directly generates passive sentences like (31b) and (28b).*
☞ *The selectional requirements must be stated **separately for active and passive sentences (inelegant reduplication)**.*
😄 *Simple/Elegant Solution: The passive transformation forms passive sentences from active sentences.*

👉***The same selectional requirements can be imposed on the output of PS rules uniformly for both active and passive sentences** (as illustrated in (31a)).*

Some may say…

"The passive transformation is motivated because an active-passive pair are synonymous."

Or,

"The active sentence is the 'basic form' because it directly represents the predicate-argument structure."

👉 Neither of these is assumed in *Syntactic Structures*.

🤔 *Possibility (rejected): The passive rule preserves the positions of the subject (NP_1) and the object (NP_2).*
👉 *This would complicate the statement of selectional requirements, deriving (31b) from (28a).*

The contrast between (32) and (33) below also rejects the possibility.

(32)   a. All the people in the lab consider John a fool.
          b. John is considered a fool by all the people in the lab.

Derivation of (32):

selection

i. All the people in the lab <consider + a fool> [John]$_{singular}$ 👉 <consider + a fool> = complex V

transformation

ii. All the people in the lab consider [John]$_{singular}$ a fool.   (=(32a))

passive transformation

iii. [John]$_{singular}$ is considered a fool by all the people in the lab.   (=(32b))

👍 <consider + a fool> selects a singular NP.

(33)   a. * John considers all the people in the lab a fool.
          b. * All the people in the lab are considered a fool by John.

Derivation of (33):

❌ selection

i. John <considers + a fool> [all the people in the lab]$_{plural}$.

👎 ~~<consider + a fool> selects a singular NP.~~

🤔 *Possibility (rejected): The passive rule preserves the positions of the subject (NP_1) and the object (NP_2).*
👉 *The ungrammatical (33b) would be derived from the grammatical (32a) (or (32i)).*
➡️ *A stipulation would then be required to exclude the example.*
Why (32b) is grammatical despite it is derived from the ungrammatical (33a) (or (33i))?

😄 *Simple/Elegant Solution: The passive rule exchanges the positions of NP_1 and NP_2 as in (27).*

📎**NOTE**

The argument of (32, 33) stands independently of the complex V analysis of *consider + a fool*.

Stowell (1981): *John + a fool* in (32a) constitutes a small clause with the predicate *a fool* and the subject *John*.

👉 The predicate *a fool* selects a singular subject.

All the people in the lab consider [sc [a fool] [John]singular]

❌

John considers [sc [a fool] [all the people in the lab]plural].

🤔 *Possibility (rejected): What if the "active transformation" exists?*

(34)   a. The wine was drunk by the guests.
         b. John was drunk by midnight.   📎 *drunk* = adjective (see (35)): "this adjective … originate[s] from
                                                    en + drink." -Chomsky (1957: 80)

(35)   a. * The wine was <u>very</u> drunk by the guests.
         b. John was <u>very</u> drunk by midnight.

(36)   a. The guests drank wine.
         b. * Midnight drank John.

💡 "Active transformation" of (36) from (34)

(34a): The wine was drunk by the guests.   ➡   (36a): The guests drank wine.

(34b): John was drunk by midnight.   (36b): * Midnight drank John.

👉 *The active transformation would incorrectly generate (36b).*

💡 Stronger arguments to reject the active transformation under simplicity and elegance:
    -Two distinct rules produce active sentences.
    ① The active transformation (when a sentence is with a V + NP sequence (i.e. (36a)))
    ② PS rule (when a sentence is **not** with a V + NP sequence)

👉 *The active transformation would just be redundant.*

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*"Chomsky considers all possibilities without preconception, including the derivation of active
from passive, and argues for a set of specific proposals on the basis of the simplicity of
syntactic analysis and the overall system." p.14 (or p.268)*

Section 3.2: The Emergence of a Model for Syntax

D-structure: selectional relations

(37)   phrase structure rules → transformations → morphophonemic rules

> The Standard Theory (Chomsky 1965)
> -D-structure: the output of PS rules (and lexical insertion)
> (-S-structure: the output of the transformational component)
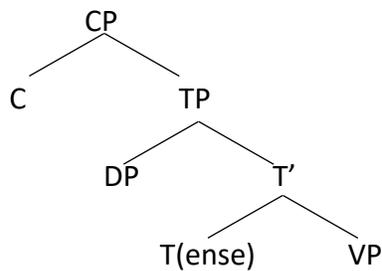>
> The Extended Standard Theory (Chomsky 1981)
> -Selectional relations are represented at D-structure (,and Logical Form is also added).
> ➡D-structure = a pure representation of selectional or thematic relations.

X' principles applying at D-structure emerge as a result of the pursuit of the simplest theory of constituent structure, described initially by PS rules.

(38)

```
              CP
            /    \
          C       TP
                 /   \
               DP     T'
                     /   \
                 T(ense)  VP
```

Toward S-structure: optional vs. obligatory transformations

◎Rule ordering: affix hopping and *do*-support

(39)   Affix hopping (=(4)):
         a. Let Af stand for any of the affixes past, present, en, ing. Let v stand for any Modal or V, or have or be
         (i.e., for any non-affix in the phrase Verb.) Then:
              Af + v → v + Af #, where # is interpreted as word boundary.
         b. Replace + by # except in the context v — Af. Insert # initially and finally.

(40)   *do*-support (=(14)):
              # Af → # do + Af

(41)   a. the + man + past + take + the + book   👆 underling form of (41b)
         b. The man took the book.

🤔 *Possibility (rejected): Rule ordering– 1. (39b), 2. (39a)*

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(42)   a. # the # man # past # take # the # book #   👉 (39b)
         b. # the # man # do + past # take # the # book #   👉 (40): the context is set for *do*-support

⬇️

(43)   * The man did take the book.   👉 No chance to apply (39a)

➡️ · *(39a) must apply first: Fixed rule ordering–1. (39a), 2. (39b)*
        · *(40)="last resort"*

◎Rule ordering: Wh-fronting

(44)   Who took the book?

🤔 *Possibility (rejected): Rule ordering– 1. (39) and (40), 2. Wh-fronting*

(45)   a. who + past + take + the + book
         b. past + who + take + the + book   👉 1. Question rule
         c. # past # who # take # the # book #   👉 **2. (39): WORD BOUNDARY**
         d. # do + past # who # take # the # book #   👉 **3. (40): DO-SUPPORT**   **2, 3 MUST APPLY AFTER 4.**
         e. # who # do + past # take # the # book #   👉 **4. WH-FRONTING**

⬇️

(46)   * Who did take the book?

😁 *Correct ordering– 1. Wh-fronting, 2. (39) and (40)*

(47)   a. who + past + take + the + book
         b. past + who + take + the + book.   👉 1. Question rule
         c. who + past + take + the + book   👉 **2. WH-FRONTING**
         d. who + take + past # the + book   👉 **3. (40): DO-SUPPORT**   OK
         e. # who # take + past # the # book #   👉 **4. (39): WORD BOUNDARY**

⬇️

(44)   Who took the book?

👉*(39): affix-hopping and (40): do-support are ordered after the other transformations.*

(48)   phrase structure rules → D-structure → transformations → affix-hopping/*do*-support → phonological
         component
Cf. (37) phrase structure rules → transformations → morphophonemic rules

◎ Rule-ordering paradox

(49)　　C　→　$\begin{cases} \text{S in the context of NP}_{sing}\_ \\ \text{ø in the context of NP}_{pl}\_ \\ \text{past} \end{cases}$

📎 *C = Tense* in *Syntactic Structures*
This looks like PS rule but is context-sensitive.
This applies after the passive transformation as *present* agrees with the surface subject.

👉 *(49) is included among the transformational rules.*

Ordering paradox $\begin{cases} \text{• (49) needs to apply } \textit{after passive} \text{ (E.g. The book is written in English.)} \\ \\ \text{• (49) needs to apply } \textit{before the question formation} \text{ (E.g. What do the men \_\_ eat?)} \end{cases}$

⚔️💥　　　　　　　　　　　　└ – –┘agree

└❌┘　　　　└ – –┘
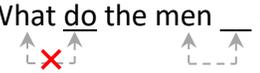
(50)　　What do the men eat?　　　👉 *present* agrees with *the men*, not with *what*.
➡️ *The copy (or trace) theory of movement solves the paradox.*

◎ The copy (or trace) theory of movement

(51)

```
        CP
       /  \
      C    TP
      ↑   /  \
     DP    T'
     ↑    /  \
      └→ T    VP
     Agreement
     Movement
```
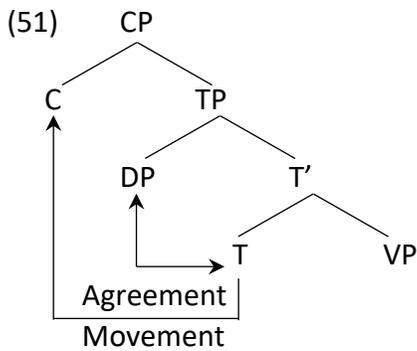
T moves to C, leaving a copy behind.
The copy agrees with the subject DP.

There is no rightward movement of the subject NP in passives:
The object NP simply moves to a "vacant" subject position in passives.
👉 If the subject NP moves rightward, its copy should block the movement of the object NP.

(52)　　The book was stolen (by a thief)　　　👉 The optionality of *by*-phrase supports the simplification

➡️ The range of transformations narrowed.

(53)　　D-structure ... X' principles, selectional relations

　　　　　↓ transformations

　　　　S-structure ... agreement

　　　　　↓ affix-hopping, *do*-support

　　　　Phonetic Form
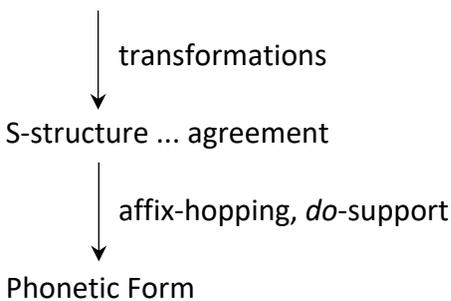
◎ Optional and obligatory transformations

Passive: optional
affix-hopping: obligatory

Movement to the subject position: obligatory

(54)   a. * (There) was stolen a book.
        b. A book was stolen ___.

👉 *Why these movements are obligatory?*
➡️ *Chomsky and Lasnik (1977):*
    NPs are limited to the four positions in English.

(55)   a. * (It) is likely [John to succeed].
        b. John is likely [___ to succeed].

(56)   *The distribution of NPs in English (Chomsky and Lasnik (1977)):*
        a. the position following a transitive verb
        b. the position following a preposition
        c. the subject position of a tensed clause
        d. the subject position of a noun phrase

👉 *will be motivated by Jean-Rger Vergnaud's Case theory.*

👉 (54a) and (55a): *a book* and *John* appear in illicit positions.
    ➡️   Advent of Move-α: "Move anything anywhere optionally."

(56) ➡️ (57) Case filter

(57)   * NP if NP has phonetic content and no Case.

Figure 1 Cf. (53)
    D-structure ... X' principles, selectional relations

        Move-α

    S-structure ... agreement, Case filter

        affix-hopping, *do*-support

    Phonetic Form

📎**NOTE**
💡 This model is a direct descendent of the model of *Syntactic Structures*.
💡 The very same quest for simplicity and elegance led to this model.

Section 4: A Minimalist Perspective on Transformations

The Minimalist research began to eliminate the distinction of PS rules and transformations.

Section 4.1: Merge and the Last Resort Nature of Phrasal Movement
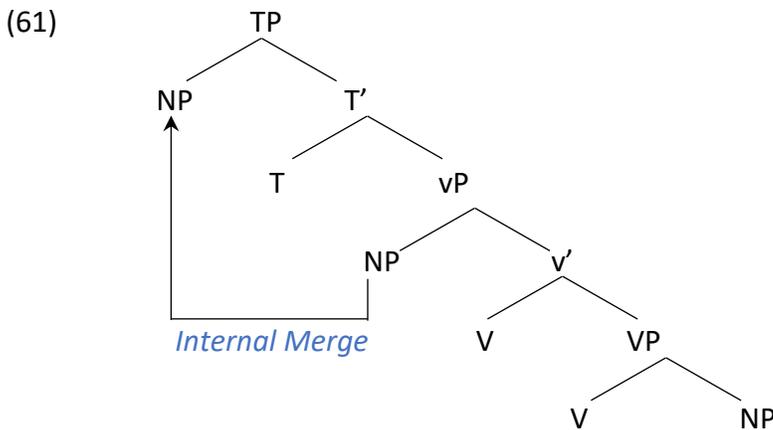
◎ Eliminating D-structure and S-structure

Merge: the minimal operation required for Language takes two objects α, β and forms a constituent γ.

(58) $\gamma = \{ \alpha, \beta \}$

(59) a. γ b. γ

         α β α β

                                                                              ...α...

👉 (59a)=External Merge: Merge takes two *independent* objects α, β and forms γ.
     (59b)=Internal Merge: Merge takes α and β *where α is contained within β* and forms γ.

(60)   The man took the book.

(61)

```
                TP
             /      \
          NP          T'
          ↑        /      \
          |      T          vP
          |             /        \
          |           NP           v'
          |          ___         /    \
      Internal Merge           V        VP
                                       /    \
                                      V       NP
```

> 📎**NOTE**
> 💡 The predicate-internal subject hypothesis:
> the subject NP is *extenrally merged* at the
> specifier position of vP.
> 💡 The structure is straightforwardly built with
> *Merge*.

> *"The conception of phrasal movement as an instance of Merge eliminates its special status,*
> *and answers the question why phrasal movement exists. Language has phrasal movement*
> *just because it has the minimally required operation, Merge." p.22 (or p. 276)*

A few more steps…

The optional application of Move-α (i.e. Internal Merge): "Move anything anywhere optionally."
➡️   Overgeneration: (62), (63)

(62)   a. The man ate nothing.
         b. * Nothing the man ate ____.
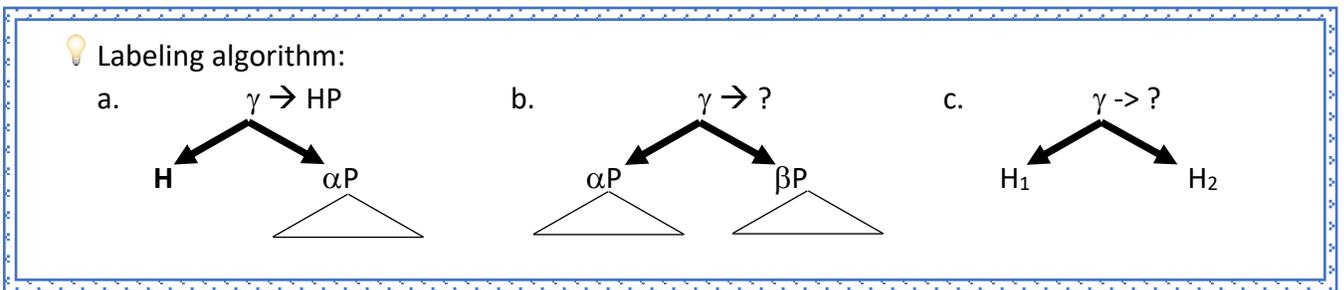
20

(63)   a. The man did not eat anything.
        b. * Anything, the man did not eat ____.

(64)   Case filter:
        John is likely [____ to succeed].   👆*John* receives Case in the matrix subject position: Internal
                                                       Merge applies as a last resort.

        ➡️ *Problem: Internal Merge is distinguished from external Merge.*
        😀 *Solution (Chomsky (2013)): Merge must accompany a labeling algorithm that specifies the nature of
           the newly formed object.*

◎ Labeling algorithm

(65)   a. γ = { H, αP }   👆 *Head-Phrase*
        b. γ = { αP, βP }   👆 *Phrase-Phrase*
        c. γ = { H_1, H_2 }   👆 *Head-Head*

💡 Labeling algorithm:
    a. $\gamma \rightarrow$ HP   b. $\gamma \rightarrow$?   c. $\gamma \rightarrow$?

        H αP αP βP H_1 H_2

➡️ *Phrase-Phrase Relations (i.e. (65b)) occur in actual derivations.*

(60)   The man took the book.

(66) $?_2 \rightarrow$ <ϕ, ϕ>

        NP   TP   👆 *(65b): Phrase-Phrase*

                T $?_1 \rightarrow$ vP   👆 *Head-Phrase*

                    NP   vP   👆 *(65b): Phrase-Phrase*

                        v   VP   👆 *Head-Phrase*

                            V   NP   👆 *Head-Phrase*
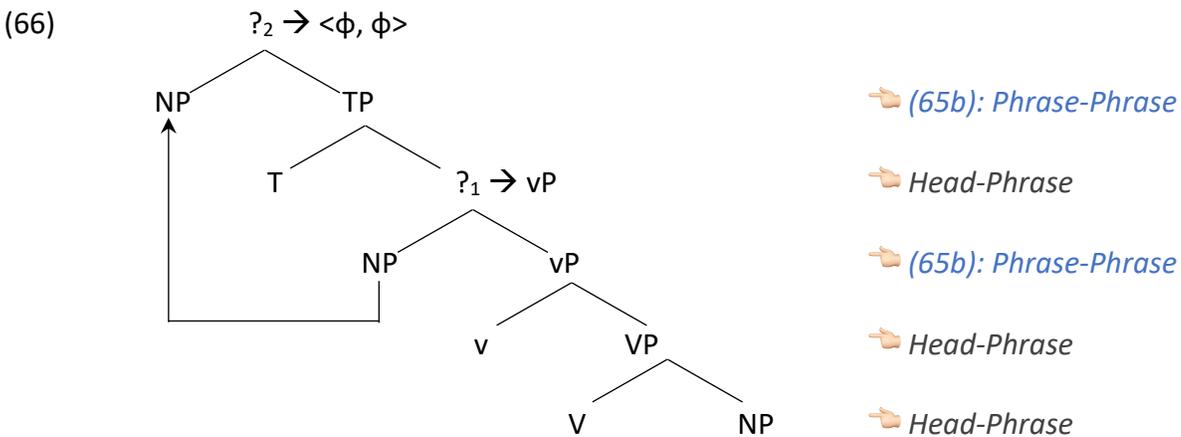
        👉 $?_1$ is labeled as vP: $?_1$ only dominates a copy of this NP and does not contain it in full.
 $?_2$ is labeled as <ϕ, ϕ>: T and NP share the same ϕ features because of agreement.

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➡️ Movement always terminates with the internal merge of two phrases that share some features.

(67)   [?2 which book [CP do you think [?1 which book [CP John bought which book]]]]

👉 ?1 → CP: ?1 does not contain *which book* in full because it is a lower copy.
?2 → <Q, Q>: *which book* and C share the Q feature because of agreement.

(68)   *Anything the man did not eat ___.   (=(63b))

👉 As the negative polarity item *anything* does not qualify as a topic, the example is not an instance of topicalization: Simple internal Merge of NP with TP.

(69)
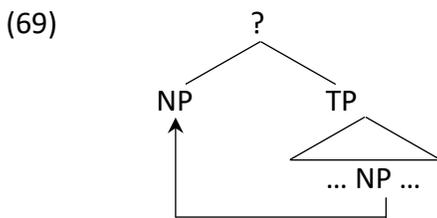
👉 No feature sharing/agreement between NP and TP

Labeling algorithm ➡️ Last resort is not a property of internal Merge.
💡 Internal Merge is not distinguished from external Merge: Phrasal movement transformation = Merge.

Section 4.2: Transformations and the Selectional Relations

External Merge creates configurations of selectional (thematic) relations.
Internal Merge modifies the base structure.

Bošković (1997) and Hornstein (1999,) among others: Movement into thematic positions takes place.
Hornstein 👉 D-structure is abandoned: Nothing blocks movement into a thematic position unless it is prohibited by stipulation.

(70)   a. The man tried [PRO to buy the book].   👉 Relation (subject-verb): *The man-try*, PRO-*buy*
b. The man tried [___ to buy the book].   👉 Relation (subject-verb): *The man-try*, *the man-buy*

👉 D-structure (LGB): A subject needs to appear in the matrix subject position at D-structure.
No D-structure: (70a) is best analyzed as in (70b).
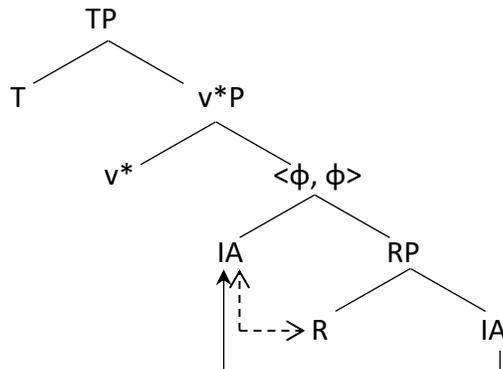➡️ *The distinction between external Merge and internal Merge is eliminated completely.*

A language must have Merge, and phrasal movement comes with it.

Syntactic Structures initiated research on syntax as a science, and the quest for simplicity will continue as long as syntax continues to be pursued as a science. p.27 (or p.282)

Discussion

I. Another example of movement into a thematic position?

・Chomsky (2015): IM of IA with Spec R (or V) within v*P

```
                    TP
                   /  \
                  T    v*P
                      /   \
                    v*    <φ, φ>
                         /      \
                       IA        RP
                      ⋀⋀        /  \
                       └--->R      IA
                        └_____┘
```

☞ Is Spec-R a thematic position? If so, this supports movement into thematic positions. However, what is the interpretation of the complement of R?

II. Duality of semantics and thematic positions

Duality of semantics:

"At the semantic interface, the two types of Merge correlate well with the duality of semantics that has been studied within generative grammar for almost 40 years, at first in terms of "deep and surface structure interpretation" (and of course with much earlier roots). To a large extent, EM yields generalized argument structure (theta-roles, the "cartographic" hierarchies, and similar properties); and IM yields discourse-related properties such as old information and specificity, along with scopal effects. The correlation is reasonably close, and perhaps would be found to be perfect if we understood enough." (Chomsky 2008: p. 140)

☞ Spec-R may have a discourse-related property.

John shot <u>Mary</u>.　　Mary: theme
John shot at <u>Mary</u>.　Mary: theme

☞ The complement of *shoot at* is a thematic position ➔ The complement of *shoot* can be thematic.

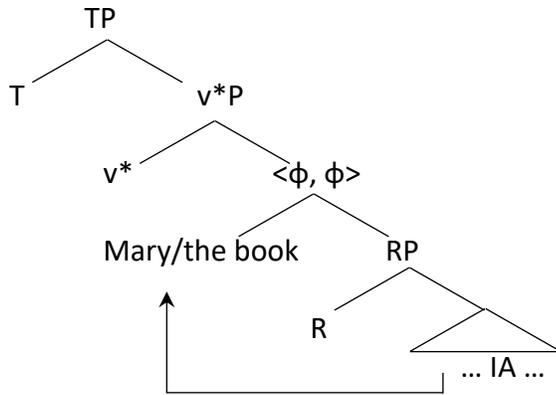| |
|---|
| <Resultatives> |
| 　John shot Mary dead. |
| *John shot at Mary dead. |

If someone wants to say, "the bullet hit Mary," the Spec-R may yield this special meaning.

☞ *Spec-R might not be a thematic position*.

<Double Objects>
John sent Mary a book.   ← Mary: old information
John sent the book to Mary.   ← the book: old information

```
                    TP
                  /    \
                T        v*P
                       /    \
                     v*      <φ, φ>
                            /      \
                   Mary/the book    RP
                         ↑        /    \
                         |       R      ⟨... IA ...⟩
                         |_____|
```

👉 *Mary/the book* in Spec-R may be interpreted as "the old information."
💡 Scopal effects are also observed between the two IAs in the double object construction.

I showed Mary herself.   I showed no one anything.

*I showed herself Mary.   *I showed anyone nothing.   etc.

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Ellipsis

1. Introduction
(1) a. **<u>N'-ellipsis</u>**   (=[5a])

    Taroo no taido wa [$_{DP}$ Hanako no [$_{NP}$ e]] yorimo yoi.

    b. **<u>sluicing</u>**

    Kare wa dokoka e itta ga, boku wa [$_{CP}$ doko e [$_{C'}$[$_{TP}$ e] ka]] siranai.   (=[5b])

    c. **<u>argument ellipsis</u>**

    Taroo wa zibun no kuruma o aratta. Hanako mo [$_{DP}$ e] aratta.   (=[5c])

2. A Preliminary Survey of the Phenomena
2.1 N'-ellipsis
➢ <u>Saito and Murasugi (1990)</u>: Evidence for CP/DP and N'-ellipsis in Japanese

<u>N'-ellipsis</u>

(2) a. I read Bill's book, but I haven't read [$_{NP}$ Mary's [$_{N'}$ ~~book~~]].   (=[6a])

    b. Rome's destruction was worse than [$_{NP}$ London's [$_{N'}$ ~~destruction~~]].   (=[6b])

<u>sluicing</u>

(3) a. John bought something, but I don't know [$_{S'}$ what [$_{S}$ ~~he bought~~]].   (=[7a])

    (S = T, S' = TP)

    b. John knows [$_{S'}$ which girl [$_{S}$ Mary likes]], but he doesn't know [$_{S'}$ which boy [$_{S}$ ~~she likes~~]].   (=[7b])

➢ <u>Mysterious properties</u>:

    (i) Intermediate projections are elided.

    (ii) N'-ellipsis is possible only with a genitive remnant. Sluicing requires a *wh*-phrase that moved out of the elided S.

(4) a. *John has a dog, but Mary doesn't have [$_{NP}$ a [$_{N'}$ ~~dog~~]].   (=[8a])

    b. *I want to read the book because I hear good thing about [$_{NP}$ the [$_{N'}$ ~~book~~]].   (=[8b])

(5) a. *John said he saw a unicorn, but I don't know [$_{S'}$ if [$_{S}$ ~~he saw a unicorn~~]]. (=[9a])

    b. *John denied that he cheated, but I believe [$_{S'}$ that [$_{S}$ ~~he cheated~~]].   (=[9b])

➢ <u>Saito and Murasugi (1990)</u>:

    The DP hypothesis and the CP hypothesis (<u>N'-ellipsis</u>⇒the NP complement of D is elided. <u>Sluicing</u>⇒the TP complement of C is elided.)

(6) **<u>Ellipsis</u>**: The complement of a functional category F (D, C or T) can be elided only

when F has a specifier, as illustrated below. (=[10])

```
            FP
          /    \
        XP      F'
               /  \
              F    Y̶P̶
```
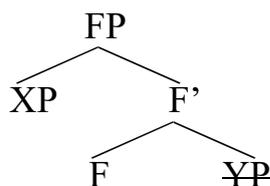
➢ **Argument-adjunct asymmetry**:

(7) a. Taroo no taido wa [Hanako no __] yorimo yoi. (=[19a])

  b. Rooma no hakai wa [Kyooto no   __] yorimo hisan datta. (=[19b])

(8) a. *Saikin wa kumori no hi ga [ame no __] yorimo ooi. (=[19c])

  b. *Taroo wa issyuukan ni san-satu no hon o yomu ga, Hanako wa [go-satu no __] o yomu. (=[19d])

➢ N'-ellipsis is legitimate only when the remnant genitive phrase is in Spec, DP. Arguments but not adjuncts can move to Spec, DP.

(9) a. [$_{DP}$ the barbarians'$_i$ [$_{NP}$ t_i [$_{N'}$ destruction t_i then]]]
   b. [$_{DP}$ the city's$_i$ [$_{NP}$ [$_{N'}$ destruction t_i then]]]
   c. *[$_{DP}$ then's$_i$ [$_{NP}$ [$_{N'}$ destruction of the city t_i]]]

➢ **Consequences:**
  (i) D is present in Japanese.
  (ii) Genitive Case can be assigned (or valued) within NP.

(10) [$_α$ DP/PP β]⇒[α DP/PP *no* β], where α and β are projections of N or D. (=[24])

2.2 VP-Ellipsis and Sluicing
➢ Otani and Whitman (1991): VP-ellipsis
   Takahashi (1994): Sluicing

(11) Taroo wa zibun no kuruma o aratta. Hanako mo [e] aratta. (=[25])
   (strict interpretation: Hanako also washed his (=Taroo's) car)
   (sloppy interpretation: Hanako also washed her (=Hanako's) car)

➢ Sloppy interpretation obtains with ellipsis but not with pronouns.

(12) a. John loves his mother, and Mary does, too. (Mary loves his/her mother) (=[26a])
    b. John loves his mother, and Mary loves her, too. (Mary loves his mother) (=[26b])
(13) Taroo wa zibun no kuruma o aratta. Hanako mo sore o aratta. (=[27])

  (strict interpretation: Hanako also washed his (=Taroo's) car)

➢ <u>Otani and Whitman (1991)</u>: V-to-T raising followed by VP-ellipsis

[TP DP [T' [VP ~~DP~~ t_V] V + T]]   (=[28])

➢ <u>Takahashi (1994)</u>: Sluicing

(14) Taroo wa [CP naze zibun ga sikarareta ka] wakatte inai ga, Hanako wa [CP naze ka] wakatte iru.   (=[30])
(✓ strict interpretation, ✓ sloppy interpretation)

➢ <u>Sluicing analysis</u>

(15) Kare wa dokoka e itta ga, boku wa [CP doko e ka] siranai.   (=[29])
(16) [CP [doko e]$_i$ [C' ~~[TP kare ga t_i itta]~~ ka]]   (=[31])

➢ **Problem**: there is no position for the copula *da* under the sluicing analysis.

(17) Taroo wa [CP naze zibun ga sikarareta ka] wakatte inai ga, Hanako wa [CP naze <u>da</u> ka] wakatte iru.   (=[33])
(✓ strict interpretation, ✓ sloppy interpretation)

➢ Takahashi considers an alternative analysis with a *pro* subject.

(18) …, Hanako wa [CP [TP *pro* naze (da) ka]] wakatte iru.   (=[34])

➢ However, Takahashi rejects this analysis on the grounds that it fails to account for the sloppy interpretation.

(19) …, Hanako wa [CP [TP sore ga naze (da) ka]] wakatte iru.   (=[35])
(✓ strict interpretation, *sloppy interpretation)

2.3 Argument Ellipsis
➢ <u>Oku (1998) and Kim (1999)</u>:
There are examples with elided arguments that cannot be analyzed as instances of V-stranding VP-ellipsis.

➢ <u>Null subjects allow sloppy interpretation</u>

(20) a. Hanako wa [CP [TP zibun no teian ga saiyoosareru] to] omotte iru.   (=[36a])
b. Taroo mo [CP [TP [e] saiyoosareru] to] omotte iru.   (=[36b])

➢ <u>Oku's (1998) conclusion</u>: arguments can be directly elided (i.e., argument ellipsis)

➢ <u>Saito's (2004) solution to Takahashi's (1994) problem</u>:
(i) The elliptic structure derives from a cleft sentence.
(ii) The embedded CP subject undergoes argument ellipsis.

(21) Hanako wa [CP [TP [CP ~~Op~~i [C' [TP ~~zibun ga~~ ti ~~sikarareta no~~]] ga naze$_i$ (da)] ka] wakatte iru.   (=[47])

➤ As there is no *pro* subject and the example is derived by ellipsis, sloppy interpretation is expected.

3 Descriptive Issues
3.1 Argument Ellipsis and *pro*
➤ Hoji (1998): An indefinite *pro* analysis

(22) a. Subete no nihonjinhuuhu ga betubetu no gakusei o suisensita.   (=[51a])
    b. Subete no amerikajinhuuhu mo [e] suisensita.   (=[51b])
    (✓ strict interpretation, *sloppy interpretation)

(23) a. Subete no itinensei ga zibun no booru o ketta.   (=[54a])
    b. Subete no ninensei mo [e] ketta.   (=[54b])
    (✓ strict interpretation, ✓ sloppy interpretation)

➤ Hoji suggests that the null object is *pro* that stands for indefinite *booru* "a ball."

➤ Saito's (2003, 2007) criticism:
Hoji's analysis faces a problem when the second sentence contains negation.

(24) a. Taroo wa zibun no kuruma o aratta.   (=[55a])
    b. Demo, Hanako wa [e] arawanakatta.   (=[55b])
    (✓ strict interpretation, ✓ sloppy interpretation)

➤ (24b) can be true when Hanako washed Taroo's car but not her own. The indefinite *pro* analysis fails to account for this.

(25) Hanako wa kuruma o arawanakatta.   (=[56])

➤ The distributions of *pro* and elided arguments are identical (cf. Murasugi 1991).

Pro can occur in the positions of locative and temporal phrases, in addition to argument positions, but not in positions of reason and manner phrases.

(26) a. [DP [TP Hanako ga [DP [TP (sore$_i$ o) motte iru] hito] o sagasite iru] kisyoobon$_i$]
    b. [DP [TP Hanako ga [DP [TP (soko$_i$ ni) sunde iru] hito] o sitte iru] mati$_i$]
    c. [DP [TP Hanako ga [DP [TP *(sore$_i$ de) kubi-ni natta] hito] o sitte iru] riyuu$_i$]
                                               (=[59a-c])

(27) shows that argument ellipsis applies to locative phrases. (28) indicates that a reason phrase cannot be elided.

(27) a. Taroo wa [zibun no oya no ie ni] sunde iru.
    b. Demo, Hanako wa [e] sunde inai.   (=[60a])

(28) a. Watasi wa [$_{CP}$ Taroo ga zibun no sippai de kubi-ni natta to] kiite iru.
  b. Demo, [$_{CP}$ Hanako ga (*[e]) kubi-ni natta to] wa kiite inai.   (=[60b])
  (*strict interpretation, *sloppy interpretation)

➢ (28) shows that a reason phrase cannot be expressed as *pro* or be elided.

3.2 The Non-Applicability of Argument Ellipsis to Operators and Variables

項省略分析に対する Funakoshi (2012, 2013)の反論。

(62) a.　太郎は [PP 花子とだけ] 遊べる。(only>can)
　　 b. * 次郎も [e] 遊べる。

項省略の分析では、(62b)の「花子とだけ」の PP を省略できると予測するが、省略できない。V-stranding VP-ellipsis によって派生される。

(63)　次郎も [FocusP [PP 花子とだけ] [VP *tPP tv*] 遊べる。

しかし、前節まで見てきたように、項省略を支持する証拠がある。解くべき問題は、

> The question is why argument ellipsis does not apply to a phrase that forms an operator-variable chain.

Shinohara (2006)が主張した **LF コピー(LF-copying)分析**を項省略の分析に採用すればよい。

► LF コピー分析を支持する議論

① CP を省略することができる。
(69) a.　花子は [CP [TP 自分の提案が採用される] と] 思っているが、太郎は [CP e] 思っていない。
　　 b.　太郎が [CP [TP 花子がその本を買った] と] 言ったし、次郎も [CP e] 言った。

② 省略を受ける第二等位項の CP から抜き出しを適用することができない。
(70) a. * 本を$_i$ 太郎は [CP [TP 花子が t_i 買った] と] 言ったし、雑誌を$_j$ 次郎は [CP e] 言った。
　　 b. * その本を$_i$ 太郎は [CP [TP 花子が t_i 買った] と] 言ったし、その本を$_j$ 次郎も [CP e] 言った。

③ 第一等位項の CP から抜き出しを適用すること自体はできる。
(72)　その本を$_i$ 太郎は [CP [TP 花子が t_i 買った] と] 言ったし、次郎も [CP e] 言った。

(70)の非文法性および(72)の文法性を、LF コピー分析は捉えることができるが PF 削除分析は捉えることができない。

PF 削除分析：(70)を文法的、(72)を非文法的になると予測してしまう。

● (70b)に対する分析
(70) b. * その本を$_i$ 太郎は [CP [TP 花子が t_i 買った] と] 言ったし、その本を$_j$ 次郎も [CP e] 言った。

(71)　その本を$_i$ 太郎は [CP [TP 花子が t_i 買った] と] 言ったし、その本を$_j$ 次郎も [CP [TP 花子が t_i 買った] と] 言った。

● (72)に対する分析

(72)　その本を ᵢ 太郎は [CP[TP 花子が tᵢ 買った] と] 言ったし、次郎も [CP e] 言った。

(73)　その本を ᵢ 太郎は [CP[TP 花子が tᵢ 買った] と] 言ったし、次郎も ~~[CP [TP 花子がその本を 買った] と]~~ 言った。

LF コピー分析：(70)を非文法的、(72)を文法的になると予測する。

● (70b)に対する分析

(76)　*その本を ᵢ 太郎は [CP[TP 花子が tᵢ 買った] と] 言ったし、その本を ⱼ 次郎も [CP e] 言った。

(77)　[CP e] = [CP[TP 花子が その本を ᵢ 買った] と]

(76)　*その本を ᵢ 太郎は [CP[TP 花子が tᵢ 買った] と] 言ったし、その本を ⱼ 次郎も [CP[TP 花子が その本を ᵢ 買った] と] 言った。

● (72)に対する分析

(72)　その本を ᵢ 太郎は [CP[TP 花子が tᵢ 買った] と] 言ったし、次郎も [CP e] 言った。

(77')　[CP e] = [CP[TP 花子が その本を ᵢ 買った] と]

(79)　…次郎も [CP[TP 花子が その本を ᵢ 買った] と] 言った。

この LF コピーの分析を仮定すると、operator-variable chain を構成する要素に項省略を適用できないことが説明される。

(80)　a.　[CP[TP 誰がハイデラバードへ行った] か] 知っていますか。
　　　b. * いいえ。でも、[CP[TP [e] シエナへ行った] か] なら知っています。

(82)　　<u>[for which x: x a person] x</u> went to Hyderabad　　((80a)の CP)

(83)　a.　**[for which x: x a person]** went to Siena　　((80b)の[**e**]: operator の場合)
　　　b.　**x** went to Siena　　　　　　　　　　　　　　((80b)の[**e**]: variable の場合)

したがって、Funakoshi (2012)の議論は項省略に対する強い反論とはならない。

3.3　Further Issues with Sluicing ~~and N′-ellipsis~~

Takita (2012)による日本語の sluicing の存在を支持する証拠。

(88)　太郎は [CP [ModalP どこかへ行こう] と] 思っているが、[CP どこへ(??だ) か] 迷っている。

(88′)　a.　a copula construction + a null pronominal subject
　　　　　… [CP *pro* どこへ行こう(*だ)か] …

　　　b.　a cleft construction + ellipsis of the presupposition CP
　　　　* … [[CP ~~*pro* 行こうの]が~~ どこへ (だ) か] …

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(88)の文は、(91)の sluicing によって派生されることになる。

(91)　太郎は [CP [ModalP どこかへ行こう] と] 思っているが、[CP どこへ i [ModalP ~~pro t i 行こう~~] か] 迷っている。

4　Toward an Explanation

> 1) Why is argument ellipsis observed in Japanese and Korean, but not, for example, in English?
> 2) Why can only constituents of specified types be elided and why is ellipsis possible only in specific configurations?

(102) <u>Ellipsis</u>: The complement of a functional category F (D, C, or T) can be elided only when F has a specifier, as illustrated below.
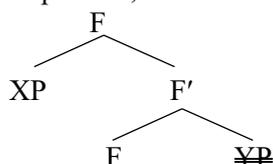
4.1　Argument Ellipsis and the (Absence of) φ-feature Agreement

(103) a.　太郎は [DP 自分の友達] を連れてきた。
　　　b.　でも、花子は [DP e] 連れてこなかった。

(104) a.　John brought [DP his friend].
　　　b. * But Mary didn't bring [DP e].

Chomsky (2000): Agree
  1) Case is closely tied with φ-feature agreement.
  2) One condition on the Agree relation is the activation condition, which states that both the probe and the goal must have unvalued features.　　　　　　　　(p. 736)

Q1: Why is argument ellipsis impossible in English?
(104) a.　John brought [DP his friend].
　　　b. * But Mary didn't bring [DP e].
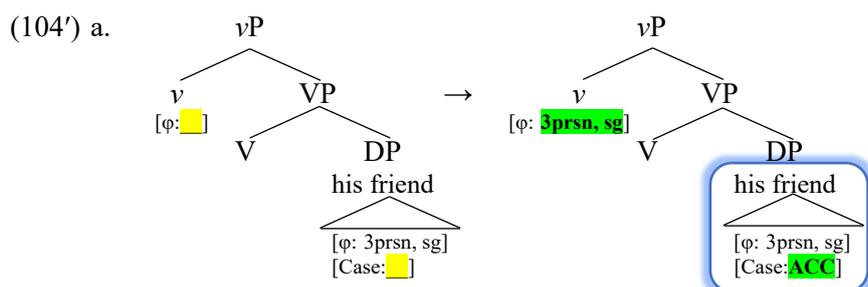
(104′) a.

(104) b. * But Mary didn't bring [DP e].

(106)
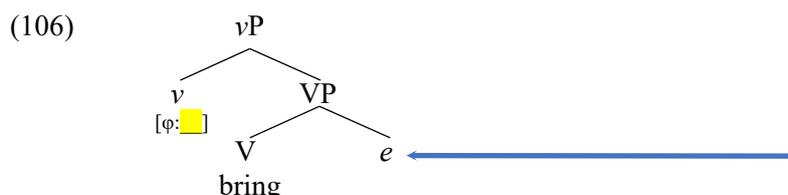
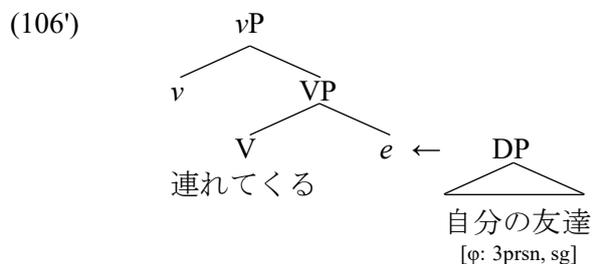"As the DP is copied from the LF of (104a), its Case feature is already valued. Then, *v* fails to enter into Agree relation with the copied DP because of the activation condition. Consequently, the φ-features of *v* cannot be valued and the derivation crashes." (p. 737)

Q2: How is it possible in Japanese and Korean?
"Japanese and Korean allow argument ellipsis precisely because these languages lack φ-feature agreement." (p. 737)

(103) a. 太郎は [_DP 自分の友達] を連れてきた。
b. でも、花子は [_DP e] 連れてこなかった。

(106')
```
           vP
          /  \
         v    VP
             /  \
            V     e ←  DP
         連れてくる          /\
                        自分の友達
                       [φ: 3prsn, sg]
```

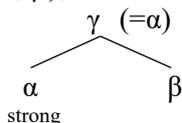## 4.2 Deriving the Licensing Condition on N′-ellipsis, VP-ellipsis and Sluicing

(115) <u>Ellipsis</u>: The complement of a functional category F (D, C, or T) can be elided only when F has a specifier, as illustrated below.
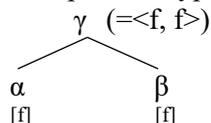```
          F
        /   \
      XP   F′
            / \
           F   Y̶P̶
```
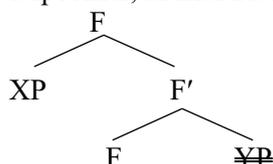
(120) * John denied that he cheated, but I believe [_CP that ̶[̶_TP he cheated]̶].

(121) John knows [_CP which girl [_TP Mary likes]], but he doesn't know [_CP which boy ̶[̶_TP she likes]̶].

(124) John thinks [_CP that [_TP Mary solved the problem]].

Chomsky's (2013, 2014) proposals on labeling ((126)) and some assumptions ((126′)):

(126) a.  In γ = {α, β}, if there is a unique head α and α is strong, α provides the label for γ.
```
        γ (=α)
      /   \
     α   β
   strong
```
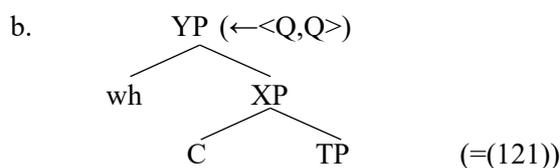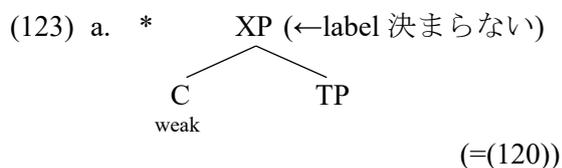
b.  Otherwise, search into α and β in order to locate heads. If the yielded heads α and β share a feature f of a specified type, then the label of γ is <f, f>.                    (p. 745)
```
        γ (=<f, f>)
      /   \
     α   β
    [f]   [f]
```
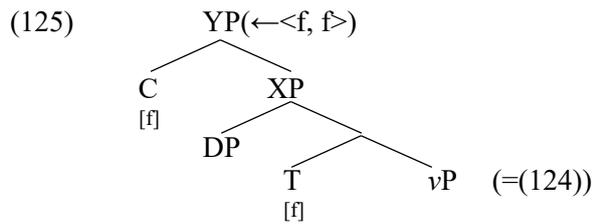
(126') a.  A functional head fails to provide a label without a specifier in the context of ellipsis.
b.  All functional heads are weak except T in null subject languages.                    (p. 744)

(120) * John denied that he cheated, but I believe [_CP that ̶[̶_TP he cheated]̶].
(121) John knows [_CP which girl [_TP Mary likes]], but he doesn't know [_CP which boy ̶[̶_TP she likes]̶].

(123) a. *        XP (←label 決まらない)           b.        YP (←<Q,Q>)
```
       /   \   /   \
      C   TP   wh   XP
    weak   /   \
                  (=(120))   C   TP   (=(121))
```

(124)　　John thinks [$_{CP}$ that [$_{TP}$ Mary solved the problem]].

(125)

```
          YP(←<f, f>)
         /        \
        C          XP
       [f]        /  \
              DP  
                  /  \
                 T    vP   (=(124))
                [f]
```

"Given that C is weak, (126a) is inapplicable to YP in (125). Then, heads must be searched in C and XP, according to (126b). Search into C immediately yields C…If either of D and T can count in this case, as assumed above, then YP can be labeled <f, f> on the premise that C and T share this feature." (p. 746)

(126)　a.　In $\gamma = \{\alpha, \beta\}$, if there is a unique head α and α is strong, α provides the label for γ.
　　　　b.　Otherwise, search into α and β in order to locate heads. If the yielded heads α and β share a feature f of a specified type, then the label of γ is <f, f>.　　　　　　(p. 745)