スクランブリング分析: コピー形成操作はラベル理論の中でどのように働くか

林 愼将 (nori@nanzan-u.ac.jp)
南山大学

0. Synopsis

・This study aims to explain Japanese scrambling and German partial *wh* movement by Form Copy.
・Syntactic objects become invisible to Minimal Search if the highest head (not the entire object) is counted as a lower copy.
・Japanese Case particles are the phonological realization of verbal/tense features.

1. Introduction

1.1. Scrambling (Saito (1985, 1992), Kuroda (1992))

(1) a. 太郎が花子を褒めた。
b. 花子を太郎が褒めた。
c. *花子太郎が褒めた。

Some Case is required for scrambling.

(2) 誰を[太郎は花子が好きなのか]次郎に尋ねた。

A scrambled object does not take scope in the landing site (radical reconstruction).
→Long-distance scrambling is neither A nor Ā movement (cf. Saito (1989, 2003) and Webelhuth (1989)).

1.2. Labeling (Chomsky (2013, 2015))

(3) [$_{\alpha}$ XP, YP]
(4) The first-located (bundle of) feature(s) by Minimal Search serves as the label in a set.
(5) A syntactic object is a bundle of features. (Chomsky (1995))
(6) The label must be determined uniquely.
(7) a. [$_{\alpha}$ H, XP] (α=H)
b. [$_{\alpha}$ XP, ~~YP~~] (α=X)
c. [$_{\alpha}$ [X[F], ZP], [Y[*u*F], WP]] (α=<F, F>)
(8) The intuitive idea is that the lower XP copy is invisible to LA [Labeling Algorithm], since it is part of a discontinuous element,[...] (Chomsky (2013: 44))

(7a): H is a bundle of features, and it serves as the label.
(7b): YP is considered a lower copy and invisible to Minimal Search (Chomksy (2013)).
(7c): Minimal Search locates X and Y, and they can provide a unique label <F, F> since they have identical features.

1.3. Saito (2014, 2016, 2018)

Saito (2014, 2016, 2018): Japanese Case particles act as an anti-labeling device.

(9) a. 花子を太郎が褒めた。 (=(1b))

b. [$_{\gamma}$ [$_{\beta}$ NP, K] [$_{\alpha}$ T, *v**P]] (α=T, β=N, γ=T)

(10) a. *花子太郎が褒めた。 (=(1c))

b. [$_{\beta}$ NP [$_{\alpha}$ T, *v**P]] (α=T, β=??)

Saito (2014: 270): Given the fact that syntactic objects with Case never project, I hypothesize that Case in Japanese has the function of making a phrase invisible to L[abeling]A[lgorithm].

Saito (2016: 3): I propose that Case marker in Japanese serves as an anti-labeling device that makes a constituent invisible for labeling.

Saito (2018: 2): [W]hy is it that Case functions as anti-labeling devises? Adapting Chomsky's (2015) distinction between strong and weak heads, I entertain the possibility in this paper that this is because suffixal Cases in Japanese are weak heads that are unable to participate in labeling.

(11) Search {α, β} for a label. If α is a weak head or search into α yields a weak head, then search on the α side is suspended and it continues only on the β side. (Saito (2018: 6))

(12) Intuition: Case particles allow Japanese scrambling.

In this study, we keep the labeling algorithm simple (cf. Hayashi (2020)). Also, intuition (12) seems correct, and we try to reformulate it in the labeling framework with Form Copy.

2. Form Copy

(13) a. John was praised John.

b. John praised John.

Chomsky (2008, 2015): The history of derivation is stored by the phase. Copies and repetitions can be distinguished by the kind of structure-building operations (external/internal Merge).

External Merge→repetitions

Internal Merge→copies

Chomsky (2021): Derivation does not have memory (strictly-Markovian). A copy relation is assigned between two structurally-identical inscriptions at a phase level.

External Merge→repetitions or copies

Internal Merge→copies (by Minimal Yield)

(14) a. John tried to win.

b. [John tried [John to win]]
EM[θ] EM[θ]

The two inscriptions of *John* must be introduced by external Merge (the duality of semantics). However, they can be assigned a copy relation.

(15) Phase level operations: Form Copy→(Agree)→Minimal Search for labeling

Chomsky (2021: 25): Principle A of the Binding Theory can be taken to be an option of FC[Form Copy]

(16) a. John regards [Bill/himself/*PRO] as a failure

b. [John *v** regards[*u*phi] [John as a failure]]
EM[θ] EM[θ]

c. [John *v** regards[*u*phi] [~~John~~ as a failure]] (after Form Copy)

(17) a. John expects [Bill/PRO/himself] to be elected

b. [John expects [John as a failure]] (by an option of [-Transitive])
EM[θ] EM[θ]

c. [John expects [~~John~~ as a failure]] (after Form Copy)

(16a): *regard* requires a visible object (maybe for labeling (cf. Chomsky (2015)).

(17a): *expect* has an option of [±Transitive]

(18) *Himself* forms a partial copy relation with its antecedent in terms of their [phi] features.
(cf. Richards (2020))

(19) a. John loves himself.

b. [John loves himself]
EM[θ] EM[θ]

(20) A syntactic object assigned a lower copy status by partial Form Copy *can* be externalized.

The lower copy is not externalized in the full copy relation because of the economy condition: the identical object is externalized in the higher place. In partial copy relations, the two syntactic objects are different. Thus, externalizing both objects does not conflict with the economy condition.

3. Analysis

3.1. Prediction of Labeling

(21) If the highest head of a syntactic object is invisible to Minimal Search, the other object can serve as the label.

(22) $[_{\alpha}\ [_{\beta}\ \sout{X},\ ZP]\ [_{\gamma}\ Y,\ WP]]$ (α=Y, β=Z, γ=Y)

Minimal Search locates X and Y, but X has a copy status, and Y serves as label α.

3.2. Scrambling

(23) a. Accusative Case particle is the realization of verbal features.
(cf. Pesetsky and Torrego (2001, 2004, 2007))

b. Accusative Case particle is assigned by Form Copy with the case assigners.

(24) [NP, K] (cf. Travis and Lamontagne (1992), Fukuda (1993), Saito (2018))

(25) a. 花子を太郎が褒めた。 (=(1b))

b. [$_{\gamma}$ 太郎が [$_{\beta}$ [$_{\alpha}$ 花子, K] 褒め[Acc]] た]

c. [$_{\gamma}$ 太郎が [$_{\beta}$ [$_{\alpha}$ 花子, ~~K[Acc]~~] 褒め[Acc]] た] (α=N, β=V)

d. [$_{\varepsilon}$ [$_{\delta}$ 花子, ~~K[Acc]~~] [$_{\gamma}$ 太郎が [$_{\beta}$ [$_{\alpha}$ 花子, ~~K[Acc]~~] 褒め[V]] た]] (γ=T, δ=N, ε=C)

(25c): V and K undergo partial Form Copy. K is externalized as the accusative marker.

(25d): Form Copy applies to set δ and α, and set δ becomes identical to set α. There are two scenarios from here:

(i) By Form Copy, the lower copy status of K in α is copied to K in δ. Then, when Minimal Search applies to ε, K is invisible, and N serves as label δ. K and C are located by Minimal Search for label ε. However, since K has the lower copy status, the other participant, C, serves as label ε.

(ii) The identity of α and δ means that the label of set δ must be identical to set α. Hence, N serves as label δ. After that, Minimal Search applies for label ε. Since N serves as the head in set δ, Minimal Search searches for the head N, rather than K. However, since N is more deeply embedded than C, C serves as label ε.

In either scenario, the label is felicitously determined as C. However, another example shows that (ii) is preferred to (i).

(26) a. *Which picture of does John wonder who Mary likes?

b. [who$_2$ [Mary likes which picture of ~~who$_1$~~]]

c. [[which picture of who$_3$] [who$_2$ [Mary likes which picture of ~~who$_1$~~]]]

(26a) is ill-formed by the proper binding effect. Kitahara (2017) and Saito (2021) analyze it with Minimal Yield. In (26b), Form Copy assigns a copy relation between *who*$_1$ and *who*$_2$. Then, *who*$_1$ becomes inaccessible, being c-commanded by *who*$_2$. Next, the internal Merge of *which picture of who*$_1$ yields two accessible inscriptions of *who*, *who*$_2$ and *who*$_3$, because there is no c-command relation between them. In scenario (i), however, Form Copy applying to *which picture of who* would make *who*$_3$ inaccessible by copying the lower copy status of *who*$_1$, and it cannot exclude (26a) by Minimal Yield.

(27) a. *花子太郎が褒めた。 (=(1c))

b. [$_{\varepsilon}$ [$_{\delta}$ 花子] [$_{\gamma}$ 太郎が [$_{\beta}$ [$_{\alpha}$ 花子] 褒め[Acc]] た]] (α=N, β=V, δ=N, ε=??)

Without a case, the labeling problem occurs concerning label ε. If scrambling is adjunction (pair-Merge), there is no labeling problem with (27b).

(28) a. 花子 (は/のこと)、太郎が褒めていたよ。

b. [$_{\gamma}$ 花子 [$_{\beta}$ [$_{\alpha}$ 太郎が~~花子~~褒めていたよ] Top]] (α=T, β=Top, γ=<Top, Top>)

c. [$_{\gamma}$ 花子 [$_{\beta}$ [$_{\alpha}$ 太郎が *pro* 褒めていたよ] Top]] (α=T, β=Top, γ=<Top, Top>)

If the Caseless objects have the topic interpretation, the sentences are fine.

(29) a. 何を読んでるの?
b. *何は読んでるの?
c. 何読んでるの?

(All the examples are from Saito (1985: 207–208))

Wh operators cannot receive the topic interpretation. Still, the bare *wh* operator seems to be scrambled in (29), but it actually stays in the base-generated position.

(30) a. ジョンが誰 (を) 殴ったの?
b. 誰をジョンが殴ったの?
c. ?*誰ジョンが殴ったの?

(All the examples are from Saito (1985: 267))

(31) a. 何をそこで読んでたのか太郎に尋ねた。
b. *そこで何は読んでたのか太郎に尋ねた。
c. そこで何読んでたのか太郎に尋ねた。
d. *何そこで読んでたのか太郎に尋ねた。

The sentences with explicitly scrambled Caseless *wh* objects are ill-formed.

(32) a. 何*(を)マサオが買ったか (Kuroda (1992: 329))
b. [$_{\gamma}$ 何[*u*Q] [$_{\beta}$ [$_{\alpha}$ マサオが~~何[*u*Q]~~買った] か[int]]] (α=T, β=C, γ=<int, int>)

If Japanese exploits the <int, int> agreement like English, a Caseless *wh* object should not yield the labeling problem, and the sentence would be grammatical, contrary to fact.

(33) Japanese does not employ English-type *wh*-movement.
(Lasnik and Saito (1992), Toyoshima (1996), Sabel (2001), *pace* Takahashi (1993))

(34) a. 何をマサオが買ったか
b. [$_{\gamma}$ 何を[*u*Q] [$_{\beta}$ [$_{\alpha}$ マサオが~~何を[*u*Q]~~買った] か[int]]] (α=T, β=γ=C)

(35) Interpretation by Contain
The interpretation of an SO[syntactic object] X is defined by the identification label of the set containing X. (Hayashi (2022: 35))

(36) a. ジョンは [メアリーが何を食べたか] 知りたがっているの? (Takahashi (1993: 657))
b. 何をジョンは [メアリーが食べたか] 知りたがっているの? (*ibid*.)

Takahashi: In (36b), *Nani-o* must take the matrix scope. It does not show scrambling property (radical reconstruction). Then, the movement is an instance of *wh*-movement.
Ishihara (2002): (36b) is also ambiguous with appropriate prosody.

(37) a. ??何をジョンが誰に [メアリーが食べたと] 言ったの? (Takahashi (1993: 664))
b. ピザをジョンが誰に [メアリーが食べたと] 言ったの? (*ibid*.)

Takahashi: The unacceptability of (36a) is due to the superiority violation of *Nani-o*. Then, the movement is an instance of *wh*-movement.

(38) a. いつジョンは [メアリーがその噂を聞いたと] 言ったの?
b. いつジョンがトムに [メアリーが何を食べたと] 言ったの?

Without the superiority effect, the long-distance scrambled *wh* object lacks the low reading in (38b), in contrast to (38a). Hence, The low acceptability of (37a) is not due to the superiority violation.

(39) a. 誰を[太郎は花子が好きなのか]次郎に尋ねた。 (=(2))
b. [$_{\gamma}$ 誰を[$_{\beta}$ ~~誰を~~[$_{\alpha}$ 太郎は花子が~~誰を~~好きなのか]]次郎に尋ねた] (α=β=C[int], γ=C)

(40) *Wh* operators may take the scope of the set with the label of the *wh* particle containing them.
(Hayashi (2022: 163))

The interpretive rule (40) can explain the radical reconstruction effects.

3.3. Subject

(41) Nominative Case particle is the realization of tense features.
(cf. Pesetsky and Torrego (2001, 2004, 2007))

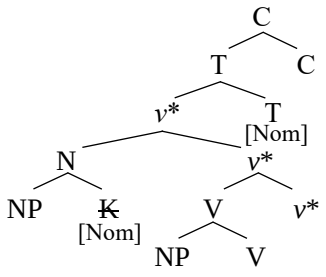
(42) Spec-head agreement is mediated by Form Copy.

(43) [$_{\alpha}$ XP[*u*F], YP[F]] (α=<F, F>)

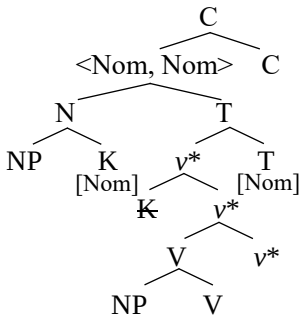
In (43), Minimal Search locates [*u*F] and [F] simultaneously, and Form Copy apply to them, by which the value of [F] can be *copied* to [*u*F].

(44) There are two nominative Case positions in Japanese. (cf. Nishioka (2019))
a. [$_{\zeta}$ [$_{\varepsilon}$ [$_{\delta}$ [$_{\gamma}$ NP, ~~K[Nom]~~] [$_{\beta}$ [$_{\alpha}$ NP V] *v**]] T[Nom]] C] (α=V, β=*v**, γ=K, δ=<Nom, Nom>, ε=T, ζ=C)
b. [$_{\eta}$ [$_{\zeta}$ [$_{\gamma}$ NP, K[Nom]] [$_{\varepsilon}$ [$_{\delta}$ ~~[$_{\gamma}$ NP, K[Nom]]~~ [$_{\beta}$ [$_{\alpha}$ NP V] *v**] T[Nom]]] C]
(α=V, β=*v**, γ=K, δ=*v**, ε=T, ζ=<Nom, Nom>, η=C)

a′.



b′.



In both cases, the nominative Case is assigned by the copy relation with T.

(45) [XP [...~~XP~~...]]

(46) The intuitive idea is that the lower XP copy is invisible to LA [Labeling Algorithm], since it is part of a discontinuous element,[...] (=(8))

(47) [*u*F] is counted as a discontinuous element of [F].

In labeling, [*u*F] becomes invisible to Minimal Search because of (47). That is why the agreement configuration can provide the unique label.

(48) Nominative Case cannot be dropped even in the A-positions.

Saito (1985: 209): Thus, if the subject NP appears without the overt nominative Case marker, it is in violation of the Case Filter[...].

(49) ジョン来たの? (Saito (1985: 207))

(50) a. 誰が来たの?

b. *誰は来たの?

c. *誰来たの?

(All the examples are from Saito (1985: 207))

The Caseless subject in (49) is a topic. If a Caseless subject cannot have the topic interpretation, the sentence becomes ill-formed as in (50c).

(51) a. [$_{\beta}$ NP [$_{\alpha}$ T, *v**P]] (α=T, β=??)

b. [$_{\gamma}$ T [$_{\beta}$ NP [$_{\alpha}$ *v**, VP]]] (α=*v**, β=??, γ=T)

Without nominative Case, the XP-YP problem cannot be solved.

(52) Bare NP cannot be a subject because it induces a labeling problem.

(53) 今朝何届いたの? (Miyagawa, Wu and Koizumi (2019: 13))

(54) a. 女 (が) 見える。 (Tateishi (1989: 412))

b. 女 *(が) ここから見える。 (*ibid.*)

Unaccusative verbs allow the caseless subjects. However, if the subjects move overtly, the sentences become ill-formed (for labeling reasons).

(55) Nominative Case→assgined by spec-head agreement
Accusative Case→assgined by V in a c-command relation

(56) Nominative Case→assgined by T in a copy relation
Accusative Case→assigned by V in a copy relation

(57) a. Mary John likes.

b. [$_{\gamma}$ *v** [$_{\beta}$ Mary~~[Acc]~~ [$_{\alpha}$ R, ~~Mary[Acc]~~]]] (α=R, β=<Acc, Acc>, γ=*v**)

c. [$_{\delta}$ Mary~~[Acc]~~ [C [John [T, *v**P]]]]

English does not license scrambling due to the lack of Case particles.

3.4. Partial Wh-Movement

(58) a. Mit wem glaubt Karl daß Maria gesprochen hat?
with whom thinks K. that M. spoken has
'Who does Karl think Maria has spoken to?' (Dayal (2000: 158))

b. Was glaubt Kahl mit wem Maria gesprochen hat?
what thinks K. with whom M. spoken has
'Who does Karl think Maria has spoken to?' (Dayal (2000: 158))

Two questions: 1. How are *wh* operators undergoing partial movement and the scope marker *was* connected? 2. Why can *wh* operators stop at the spec of the noninterrogative CPs?

(59) a. *Was* is a *wh* expletive which only has the operator part.
b. Form Copy connects the operator part of partially-moved *wh* operators and *was*.
c. The highest feature in *wh* operators is the [*u*Q] feature. (cf. Cable (2010))

(60) [$_{CP}$ was[*u*Q] [$_{C'}$ C [$_{TP}$ SUBJ [$_{T'}$ T [$_{v*P}$ was[*u*Q] [$_{v*P}$ *v** [$_{CP}$ [~~[*u*Q]~~, mit wem] [$_{CP}$ C ...~~[[*u*Q], mit wem]~~...]]]]]]]] (order irrelevant)

Was, having a copy relation with *mit wem*, can show the scope of *mit wem* and guarantees the interpretation of the [*u*Q] feature of *mit wem* as interrogative. Since the highest feature of *mit wem*, the [*u*Q] feature, is counted as a lower copy, it is invisible to Minimal Search. Then, it does not induce the XP-YP problem with the declarative C.

4. Conclusion

With the idea of partial copy relation, I suggest the third solution to the XP-YP problem: assigning a lower copy status to the highest feature of one of the phrases. The followings are other assumptions and proposals.

(61) a. The Japanese Case particles are assigned through the partial copy relation with V/T.
b. A scrambled nominal with an accusative Case particle never projects because the K head is counted as a lower copy of V.
c. Scrambling of a caseless object and a caseless subject are excluded due to the XP-YP labeling problem.
d. There is no *wh*-movement in Japanese.
e. Partial *wh*-movement is allowed because the highest head of a partially-moved *wh* operator is assigned a lower copy status.

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