A Note on Adjunc(tion), Pair-Merge, and Sequence

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Takashi Toyoshima

1. Introduction

In traditional grammars, 'modifiers' are standardly deemed optional, in contrast to 'subject' or 'object,' both of which are archetypally obligatory though the latter may as well be optional sometimes. Canonically subjects and objects are noun phrases or clauses, and sometimes prepositional phrases for the former, whereas modifiers are adjectives, adverbials, or prepositional phrases. Intransitive verbs are so defined as they do not allow a noun phrase object, and yet some intransitive verbs require an adverbial or a prepositional phrase.

(1) a. The boy behaved *(politely/like a gentleman/in a good manner).
    b. Our baby is lying *(peacefully/in comfort/there/on the couch).

Other than the reflexive middle or imperative usage, some kind of manner expression is obligatory for *behave*, and a manner or locative expression is necessary for *lie*.

Some transitive verbs also require an adverbial or a prepositional phrase.

(2) a. Jill put the key *(here/in the box).
    b. The company placed profit *(uppermost/above safety).

Given the potential optionality of objects and the obligatoriness of modifiers for some verbs, the distinction between objects and modifiers is not so clear-cut as has generally been thought. Yet, in the current framework of the Minimalist Program in generative grammar (Chomsky 2000, *et seqq*.), adjunct(ion) structures are generated by an operation distinct from the one for the head-complement structure.

This squib is just meant to be a personal memorandum for organizing my current thoughts, questions, their backgrounds, and ideas for possible directions in future research, so no solution or novel analysis is intended to be developed here. We begin by surveying the developmental history of adjunct(ion) structures and how they are created, noting, along with it, obscurities and issues that deserve but had escaped attention in the mainstream literature. The final section offers an outlook for problems to be solved.

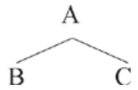
2. A Brief Selective History of Adjunct(ion)

2.1. Before Minimalism

In the early days of generative grammar, subjects and objects are regarded as arguments of a predicate head, coded in the subcategorization frame of the head in its lexical entry whereas modifiers are called adjuncts, specified with regard to their potential categories and positions in the phrase structure rules. Elementary transformations that move or reorder constituents are classified into two sorts: substitution and adjunction. In the former, phrase structure rules generate a structure with a dummy symbol, which some transformational operation replaces with some other constituent in the structure. The latter adjoins a constituent to some other node in the structure, creating a new branch. Three types of adjunction are recognized: daughter-adjunction, sister-adjunction, and ancestor-adjunction or better known as Chomsky-adjunction.

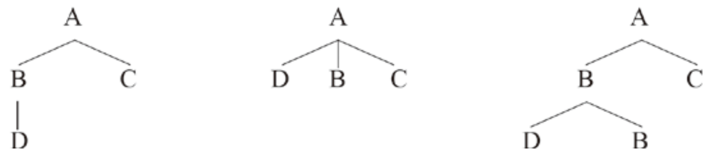
Given the structure as in (3):

(3)



daughter-adjunction of D to B derives the structure in (4a), sister-adjunction of D to the left of B yields (4b), and Chomsky-adjunction of D to the left of B, (4c).

(4) a. b. c.



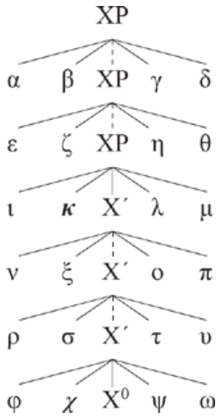
Empirical motivation for daughter-adjunction was scarce (Ross 1967), and sister-adjunction of D to the left of B is indistinguishable from daughter-adjunction of D to A and later considered as a sub-case of substitution (Bach 1974). Only Chomsky-adjunction has survived after X'-Theory supplanted the phrase structure rules. Chomsky-adjunction 'creates' or 'splits' a node with the same label of the host; the newly created node inherits the category information and projection level of the host, and the host and the newly created nodes together were later regarded as 'segments' of a single 'categorial projection' (May 1985, Chomsky 1986, *inter alia*).[1]

The general X'-schema standardly accepted recognizes three levels of projection: X^0, X', and XP, and the latter two levels can potentially recur (5a, c) to host adjunct(ion)s.

[1] See Chametzky (1994) for the problem of labeling for the newly created node by Chomsky-adjunction, and also Hornstein & Nunes (2008) for its exploitation in the theory of Bare Phrase Structure (BPS) of Chomsky (1995a, b).

(5) a. $\mathrm{XP} \rightarrow \mathrm{YP}^{*}\ \mathrm{XP}\ \mathrm{ZP}^{*}$
b. $\mathrm{XP} \rightarrow \mathrm{YP}^{*}\ \mathrm{X'}\ \mathrm{ZP}^{*}$
c. $\mathrm{X'} \rightarrow \mathrm{YP}^{*}\ \mathrm{X'}\ \mathrm{ZP}^{*}$
d. $\mathrm{X'} \rightarrow \mathrm{YP}^{*}\ \mathrm{X}^{0}\ \mathrm{ZP}^{*}$

(6)



In the X´-tree diagram (6), all the sisters to X^0 (φ, χ, ψ, ω) are complements, the left innermost daughter to the lowest XP, ***κ***, is the specifier, and all others (α, β, γ, δ, ε, ζ, η, θ, ι, λ, μ, ν, ξ, ο, π, ρ, σ, τ, υ) are adjuncts. Depending on the language and the category, complements may be restricted to appear either only to the left or right of the head X^0 (head parameter), and the specifier may be thought of as some kind of special adjunct that has a special relationship with the head X^0 (spec-head agreement), as suggested in Kuroda (1988).[2]

More important is the fact that whereas the recurred XPs are considered as 'segments' of a single XP 'category' projection, it has never, to the best of my knowledge, been talked about whether or not the recurred X´s are also 'segments' of a single X´ level of an intermediate projection, and if so, what the difference is between the lowest 'segment' of XP and the highest 'segment' of X´.

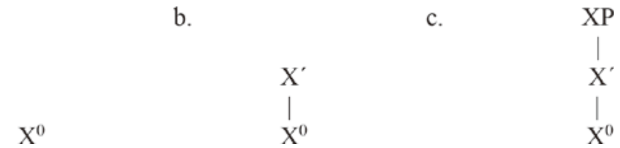
2.2. From the Inception of Minimalism until Recently

In the initial exposition of the Minimalist Program, Chomsky (1993) aban-

2 Object vs. subject/adjunct asymmetry subsumed under the Condition on Extraction Domain (CED: Huang 1982) renders further support for Kuroda's view that the specifier is an adjunct with a special relation to the head.

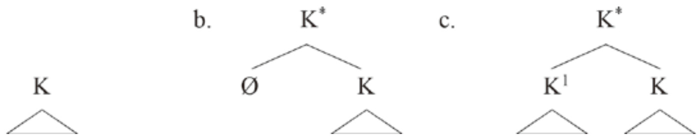
doned non-interface levels of structural representations, such as D-Structure or S-Structure, and instead proposed that syntactic structures are built up incrementally in the course of derivation by recursive application of a single transformation, Generalized Transformation (GT), revived with revision from Chomsky (1955, 1957). The computational system of human language C_{HL} first selects a lexical item X^0 and projects it to an X´-kernel as the derivation proceeds (*cf*. Project α of Speas 1990).

(7) a.



GT targets a phrase marker K (8a), 'adjoins' an empty symbol Ø to K, forming K^* (8b), and substitutes another phrase marker K^1 for Ø (8c), conforming to X´-schemata.

(8) a.



When K^1 was built separately from K and K^*, it is equivalent to base-generation; a unary application of GT to K, copying K^1 from within K, results in movement. In either case, the empty symbol Ø is 'adjoined' to the host K, 'extending' the latter to K^*, which is called the Extension Requirement. Thus, each step of structure-building involved 'adjunction' of Ø and 'substitution' to Ø. Yet, only when K and K^* are the same level of a projection, they are 'segments' of the same category, constituting an adjunct(ion) structure.

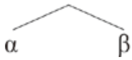
Dispensing with X´-schemata of any kind, including the notion of three-leveled X´-kernel, Chomsky (1995a, b) proposed the theory of Bare Phrase Structure (BPS), in which levels of projections are not marked but derivatively read out of structural configurations, following Muysken (1982).

(9) Given a phrase marker, a category that does not project any further is a maximal projection XP, and one that is not a projection at all is a minimal projection X^0; any other is an X´, invisible at the interface and for computation. (Chomsky 1995b, 61f.)

There are no spurious non-branching projections, and a minimal projection, X^0 in the traditional X´-theory, can be maximal at the same time, equivalent to the X´-theoretic non-branching XP. Unlike in X´-Theory, multiple specifiers are allowed in principle, and no linear order is implied among constituents.

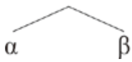
Structures are built up step-by-step in the course of derivation by *Merge* or *Move*, two structure-building operations decomposed of GT, and there is no 'specifier' in the traditional X´-theoretic sense as one does not exist before some constituent is merged or moved to a maximal projection which projects further, turning itself into non-maximal. Thus, no movement can be 'substitution' in the traditional sense, and both *Merge* and *Move* are 'adjunction' operations to a host (*cf.* Kayne 1994). The distinction between 'substitution' and 'adjunct(ion)' is made in terms of how the host projects: if the host projects to a higher level, it is equivalent to 'substitution' whereas if a 'segment' is projected, it is equivalent to 'adjunct(ion).' A maximal projection becomes non-maximal when it projects further by merging or moving another constituent to it in the course of derivation.

In the incipient BPS, structures are represented with a labeled set: *Merge* or *Move* takes two syntactic objects α and β, and forms $\gamma = \{\delta, \{\alpha, \beta\}\}$, where δ is the label of γ, indicating the head of γ. The label δ is either the head of α or of β, whichever projects. Syntactic objects are lexical items or phrasal constituents already built recursively out of them by *Merge* and/or *Move*.

(10) 

$\gamma = \{\delta, \{\alpha, \beta\}\} = \{H(\alpha), \{\alpha, \beta\}\}$ if α projects, or
$\{H(\beta), \{\alpha, \beta\}\}$ if β projects

Adjunct(ion) structures are distinguished in terms of the label of the set: the label is taken to be an ordered-pair of the same head <H, H>.

(11) 

$\gamma = \{\delta, \{\alpha, \beta\}\} = \{\langle H(\alpha), H(\alpha)\rangle, \{\alpha, \beta\}\}$ if β adjoins to α, or
$\{\langle H(\beta), H(\beta)\rangle, \{\alpha, \beta\}\}$ if α adjoins to β

Here, α or β is the host of the adjunct(ion), and presumably retains its original label as α or β; only the newly created node γ obtains the label of an ordered-pair of the same head, <H(α), H(α)> or <H(β), H(β)>.

Nevertheless, the relational read-out of the projection levels as [± maximal, ± minimal] does not quite capture the maximality of each 'segment' in such adjunct(ion) structures. Hornstein & Nunes (2008) demonstrate the conservation of the maximality of the host of the adjunct(ion).

(12) a. John could [eat the cake] and [eat the cake] he did.
b. John could [[eat the cake][in the yard]] and [eat the cake] he did [in the yard].

(13) a. … and [[eat the cake][in the yard]] he did [with a fork].
b. … and [[[eat the cake][in the yard]][with a fork]] he did.

Presumably, PP [in the yard] is adjoined to VP [eat the cake] in (12b) so that [[eat the cake][in the yard]] constitutes (the upper 'segment' of) VP, and yet (the lower 'segment' of) VP [eat the cake] can undergo VP-Preposing, leaving the upper 'segment' of VP with the remnant PP. That is, the lower 'segment,' the host VP of the adjunction of PP, retains its maximality. Yet, as can been seen in (13), the entire VP, the upper(most) 'segment' of VP, can undergo VP-

Preposing as well. Such maximality of each 'segment' can be observed in other grammatical phenomena, such as VP-ellipsis, *do-so* anaphora, and *one*-substitution in NP. This state of affairs demands more explicit elaborations in (9), as to what kind of 'projections' are "invisible at the interface and for computation."

Decomposing *Move* into *Merge* + *Agree* (+ *Generalized Pied-Piping*) and discerning two subtypes of *Merge*, Chomsky (2000) reinterpreted 'substitution' structures as ones produced by Set-Merge and 'adjunct(ion)' structures by Pair-Merge, and suggested elimination of labels since they are predictable in BPS representations (*cf*. Collins 2002). Directly encoding the difference in their projection statuses into their respective derived structures, 'substitution' by Set-Merge as a symmetric operation yields a binary set whereas 'adjunct(ion)' by Pair-Merge as an asymmetric operation yields an ordered-pair.[3]

(14) a. Set-Merge(α, β) = {α, β}
b. Pair-Merge(α, β) = <α, β>

Reconceptualizing *Merge* as a free operation for C_{HL} and converting to the view that the property of 'movement/displacement' need not be triggered either, Chomsky (2004) identified two types of *Merge*: External Merge (EM) and Internal Merge (IM). EM corresponds to 'base-generation' and IM to 'movement/displacement' in the traditional sense. Together with the distinction in (14) above, *Merge* is cross-classified into four subclasses: External Set-Merge, Internal Set-Merge, External Pair-Merge, and Internal Pair-Merge, roughly corresponding to 'base-generation' of argument structures, 'substitution' movement, 'base-generated' adjuncts, and 'adjunction' movement, respectively (*cf*. Richards 2009).

Maintaining the assumption that *Merge* operates on two syntactic objects,

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[3] Labeling Algorithm was later proposed in Chomsky (2013, 2015) to determine the category/headedness information, independent of structure-building operations.

its cross-classification has prompted proliferations of various strains of *Merge* in the literature: Interarboreal Movement (Bobaljik 1995, Bobaljik & Brown 1997, *inter alia*), Remerge (Bobaljik 1995, Epstein, *et al*. 1998, *inter alia*), Tucking-in Movement (Richards 1997, *et seqq*., *inter alia*), Late Merge (Bošković & Lasnik 1999, Fox 1999, *inter alia*), Sideward Movement (Nunes 1995, *et seqq*., *inter alia*), Parallel Merge (Citko 2005, *inter alia*), Grafting (van Riemsdijk 2006, *inter alia*), and Multidominance by External Remerge (de Vries 2009, *inter alia*), among many others.

2.3. Up to the Minute

Dissatisfied with the disarrayed propagation of unprincipled variants of *Merge*, Chomsky (2019a, *et seqq*.) reconceives it as MERGE that operates on the workspace (WS), in which *Merge* has previously been thought to be operating on two syntactic objects. MERGE maps the current workspace (WS) to a new workspace (WS´) at the next stage of the derivation, replacing two syntactic objects in WS with a binary set of them in WS´. Chomsky's (2019b) informal rendition is as follows:

(15) MERGE(P, Q, WS) = [{P, Q}, …] = WS´

Yet, in (15), MERGE looks like a ternary operation that takes P and Q as its direct operands, along with WS. Thus, let us reformulate it as below, sharpening its intention.

(16) Let a workspace WS be a set of syntactic objects SOs, where SOs are either lexical items LIs selected from the lexicon, or sets formed by MERGE.

(17) X is a term of Y iff X $\neq$ Y, X $\in$ Y, or X $\in$ Z, Z a term of Y.

(18) For any accessible terms P and Q, $P \neq Q$ in WS,

MERGE(WS) = WS´, where
a. WS = $[SO_1, SO_2, \ldots, SO_n]$
b. WS´ = $[\{P, Q\}, SO_1, SO_2, \ldots, SO_{n-1/2}]$
c. $((R \in WS) \wedge (R \notin \{P, Q\})) \rightarrow (R \in WS')$

Terms are recursively defined SOs in (17), and the accessibility is determined by Minimal Search (MS), in which any SOs c-commanded by their copies are not accessible, and the Phase Impenetrability Condition is respected. By (18), $P \neq Q$, so that self-merger as {P, P} or {Q, Q} is excluded,[4] and by (18b) if the cardinality of WS´ is equal to WS, either P or Q is not a member of WS and one is a term of the other, instantiating Internal MERGE; if the cardinality of WS´ is smaller than WS by 1, both P and Q are members of WS, instantiating External MERGE. As the set {P, Q} is newly created in WS´, the cardinality of WS´ remains the same as the one of WS (Internal MERGE) or reduced only by 1 (External MERGE). That is, the cardinality of the workspace is monotone-decreasing (monotone non-increasing) whereas the number of accessible terms is strictly monotone-increasing by 1, adding the newly created set {P, Q}.[5] By (18c), any SOs other than P or Q remain in WS´, ensuring recoverability.

In addition to MERGE, which is a symmetric binary set-formation operation, Chomsky (*op. cit.*) discusses the necessity for an asymmetric analog for adjunct(ion), Pair-Merge. If we build on (Set-)MERGE, it would look something like the following:

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4 If self-merger is allowed, {P, P} = {P}, recursively {{P}, {P}} = {{P}}, {{{P}}, {{P}}} = {{{P}}}, and so on, yielding an equivalent of non-branching projection in X´-Theory. This is reminiscent of Zermelo's set-theoretic construction of ordinal numbers. *Cf.* von Neumann (1928).

5 P and Q in WS are accessible by definition, and their copies are rendered inaccessible or removed from WS´.

(19) For any accessible terms P and Q, $P \neq Q$ in WS,

Pair-MERGE(WS) = WS´, where

a. $WS = [SO_1, SO_2, \ldots, SO_n]$

b. $WS' = [\langle P, Q\rangle, SO_1, SO_2, \ldots, SO_{n-1/2}]$

c. $((R \in WS) \wedge (R \notin \{P, Q\})) \rightarrow (R \in WS')$

Instead of the set {P, Q}, the pair <P, Q> is created in WS´, and if both P and Q are members of WS, it is External Pair-MERGE, instantiating a 'base-generated' adjunct; if either P or Q is not a member of WS and one is a term of the other, it is Internal Pair-MERGE, instantiating 'adjunction' movement. As the newly created ordered-pair <P, Q> should be able to undergo further manipulation by (Pair/Set-)MERGE, it must also be counted as an SO, and hence a term, to be included in (16) and (17).

Attributing to Hisa Kitahara's proposal for head-to-head adjunction as Interarboreal Movement *à la* Bobaljik (1995), Bobaljik & Brown (1997), *inter alia*, Chomsky (*op. cit.*) suggests that both P and Q in <P, Q> are rendered inaccessible so that the number of accessible terms remains the same in WS´ and the problem of indeterminacy does not arise.

But such an inaccessibility, if any, seems to be restricted to head-to-head adjunction, since for phrasal adjunct(ion), the host of the adjunct(ion) can retain its (maximality and hence) accessibility, as we have seen in Hornstein & Nunes' (*op. cit.*) demonstration (12-13). Furthermore, the adjunct itself is accessible so that it is subject to movement/displacement.

(20) a. How_i did John $[_{VP}\ [_{VP}$ fix the car$]\ \boldsymbol{t}_i\ ]$?

b. $[\text{Without any professional tools}]_i$, John $[_{VP}\ [_{VP}$ fixed the car$]\ \boldsymbol{t}_i\ ]$.

What needs to be blocked is extraction out of an adjunct, known as the Adjunct (Island) Condition, subsumed under Huang's (*op. cit.*) CED.

(21) a. *Who$_i$ did [$_{IP}$ [$_{IP}$ you have lunch] [$_{CP}$ after you met $\boldsymbol{t}_i$]]?[6]
b. *Mt. Fuji$_i$, I used to [$_{VP}$ [$_{VP}$ live] [$_{PP}$ near $\boldsymbol{t}_i$]].[7]

It remains to be seen whether the Adjunct (Island) Condition is reducible to the inaccessibility of the constituents inside the adjunct.[8] Even in the head-to-head adjunction cases, it is not clear why the both coordinates of an ordered-pair become inaccessible.[9]

3. Sequence

Chomsky (*op. cit.*) brings out Pair-MERGE in the discussion of unbounded unstructured coordination, which he argues requires a sequence and its limiting case is a pair, produced by Pair-MERGE for adjunct(ion).

Chomsky (2021; 31ff.) proposes the operation FormSequence, generalizing Merge to be the combinatorial *n*-ary set-formation operation (*ibid*.: 20f. [D]) and building on it.

(22) Merge(X_1, … , X_n, WS) = WS´ = {{X_1, … , X_n}, W, Y}, satisfying SMT (Strong Minimalist Thesis: TT) and LSCs (Language-Specific Conditions: TT).

6 Assuming the temporal clause is adjoined to IP.

7 Assuming the circumlocative PP is adjoined to VP.

8 Nakashima (to appear) makes an interesting attempt to account for the Adjunct (Island) Condition in terms of indeterminacy in the framework of MERGE. Hornstein & Nunes (*ibid*.: 77f., fn.23.) suggest that adjunct(ion) structures may lack labels (*cf*. Chametzky 1994) and the label-less constituents interfere with the path calculation, blocking movement out of the adjunct(ion) structures.

9 Most likely, it has to do with some version of lexical integrity, but it is difficult to grapple with, as in the recent adoption of versions of Distributed Morphology (Halle & Marantz 1993, *inter alia*) and Exo-Skeletal syntax (Borer 2003, *inter alia*) into Minimalism (*cf*. Den Dikken 2002, Bruining 2018, *inter alia*). For lexical integrity, see Siegel (1974), Di Sciullo & Williams (1987), Roberts (1991), Lieber (1992), Bresnan & Mchombo (1995), Ackema & Neeleman (2002), Lieber & Scalise (2005), Booij (2008), Haspelmath & Sims (2010), among many others.

MERGE is just the limiting case of $n=2$ and Y is null.

(23) FORMSEQUENCE($\{X_1, \ldots, X_n\}$, WS) = WS´
$= \{<(\text{Conj},) X_1, \ldots, X_n>, W, Y\}$

Taking stock, there are two general n-ary structure-building operations, (Generalized set-formation) Merge and FORMSEQUENCE, and (Set-)MERGE and Pair-MERGE are their respective limiting cases of binary applications.[10] This state of affairs does not seem, at least to me, to be the optimal scenario for SMT, but a recipe for potential mutations. I think that the best scenario would be just one single structure-building operation for C_{HL}.

4. Outlook

As we have been seeing from the outset, the argument/adjunct distinction is not so clear-cut, and since the abandonment of X´-schemata, 'adjunct(ion)' in a sense had been unwittingly insinuated into any incremental structure-building operation as 'node-creation.'

Yet, intuitively, there seems to be a need for some kind of distinction to be drawn, fuzzy though it may be. The question is where such a distinction emanates from. My hunch is that the distinction stems from the difference in the structures themselves, not from the operations that build such structures or from any special marking on representation of such structures.

In fact, there is an ingenious proposal of reducing Pair-Merge to Set-Merge in Omune (2018a, b, 2019), employing set-theoretic reduction of an ordered-pair to a set. Exploiting Kuratowski's (1921) short definition of an ordered-pair as a set:

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[10] Chomsky (*ibid.*: 33f., fn.51) claims that the operation FORMSEQUENCE can apply non-cyclically. If so, Pair-MERGE, as its limiting case, should also be able to apply non-cyclically, which, if so, raises the same problem as Late Merge, which MERGE is supposed to solve in the first place.

(24) $\langle \alpha, \beta \rangle := \{\alpha, \{\alpha, \beta\}\}$

Omune reformulates Pair-Merge(α, β) as Set-Merge(α, {α, β}), yielding $\{\alpha, \{\alpha, \beta\}\} = \langle \alpha, \beta \rangle$. That is, to obtain the result of Pair-Merge(α, β), Set-Merge operations have been executed twice in succession: Set-Merge(α, β) = {α, β} immediately followed by Internal Set-Merge(α, {α, β}), yielding {α, {α, β}}. This two-step process may be depicted as follows:

(25) Pair-Merge(α, β) ⇔ Set-Merge(α, Set-Merge(α, β))

Or it may better be thought that Set-Merge does not have to apply successively in such a fashion, but has the option of applying in such a way. If it happens to apply this way, the resulting structure is *interpreted* as an 'adjunct(ion)' structure; otherwise, the structure is not an 'adjunct(ion)' structure. This is more befitting to the strongly Markovian nature of the system envisaged. And this idea can be straightforwardly carried over to Pair-MERGE, built on the two-step successive immediate application of Set-MERGE.[11]

Mathematically, a sequence is a totally ordered multiset (potentially containing multiple instances of each member[12]), and it can be reduced to a nested ordered-pair:

(26) $\langle \alpha, \beta, \gamma, \alpha, \gamma, \delta, \ldots \rangle = \langle \alpha, \langle \beta, \langle \gamma, \langle \alpha, \langle \gamma, \langle \delta, \ldots \rangle\rangle\rangle\rangle\rangle\rangle$

and thus further reducible to a nested set, for instance, in Kuratowski's short definition as follows:

(27) $= \{\alpha, \{\alpha, \{\beta, \{\beta, \{\gamma, \{\gamma, \{\alpha, \{\alpha, \{\gamma, \{\gamma, \{\delta, \{\delta, \ldots \}\}\}\}\}\}\}\}\}\}\}\}$

Goodman (1941) raised a concern about such reduction with the progres-

[11] *Cf*. Fong's (2022) 36ff., *e.g*. (51-61) for the discussion of problems with repetitive operations.

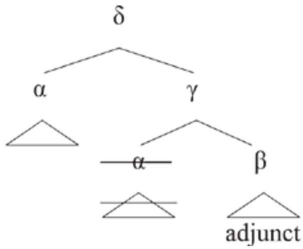
[12] *Cf*. Chomsky (*op. cit.*) 31f. fn.48.

sive raising of logical types as the length of the sequence increases and offered a solution for it. However, for syntactic structures, it does not seem to matter; a phrase is a higher type than a word and a clause is a higher type than a phrase. In BPS, a complete sentence is a nested set after all. Iterated applications of (Set-)MERGE recursively produces nested sets, part of which might be interpreted as an ordered-pair or a sequence.

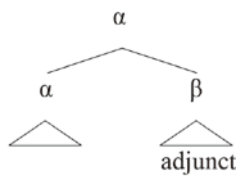
A potential problem may emerge from the set representation of the adjunct(ion) structure {α, {α, β}} as in (24); 'movement' of α is extremely local whether by 'substitution' or 'adjunction,' and it is the proto-typical configuration where some kind of anti-locality conditions may be invoked.[13] Yet, the entire structure must be of the category α, with β being the adjunct.

The two α's may appear reminiscent of the two 'segments' of the single category projection of α, but the appearance is misleading: the upper α of the set {α, {α, β}} is a copy of the lower α of the contained set {α, β} and the former c-commands the latter. If we were to represent it in an X´-tree diagram, it would look like (28a) whereas the X´-theoretic 'adjunct(ion)' structure would be something like (28b):

(28) a.



b.



In (28a = 24), the lower ~~α~~ of the contained set {α, β}= γ is inaccessible by MS, but the entire set {α, {α, β}} = δ (= the upper 'segment' of α in (28b)), its upper α, which is an identical copy of the original host of 'adjunc(tion)' ~~α~~ (=

[13] For phenomena of anti-locality, see Abels (2003), Grohmann (2011), and reference cited therein, among others.

the lower 'segment' of α in (28b)), and the adjunct β itself are accessible, accounting for Hornstein & Nunes' (*op. cit.*) observation (12-13) and the fact that the adjunct β itself can undergo 'movement/displacement' (20).[14]

The structural representation (28a) brings to mind Larson's (1988, 1990) rightward downward branching analysis,[15] where elements on the right are generally lower in the phrase structure, which is taken up in Kaynes' (*op. cit.*) theory of antisymmetry. Yet, in BPS, no linear order is entailed in the structure, and it is not clear how it makes out with premodifiers.

It remains to be seen how the Adjunct (Island) Condition and the Coordinate Structure Constraint can be accounted for, and whether other empirical phenomena vindicated by Pair-Merge or FormSequence can be analyzed in terms of nested set structures produced by the single structure-building operation (Set-)MERGE alone.

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[14] Omune (2019) argues that adjuncts (β in 28a, b) are inaccessible and in the cases where adjuncts have moved as in (20), they are in fact complements.

[15] Larson (1988: 345ff. fn.11) notes that in his rightward downward branching analysis, adverbs are not the outermost adjuncts of verbs but rather its innermost complements, assuming the semantic analysis of adverbs by McConnell-Ginet (1982). See fn.14 above.

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