

Original Article

Deriving Unstructured Parentheticals by FormSequence

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Abstract: This article addresses the syntax of unstructured parentheticals within the current minimalist framework, which revolves around Simplest MERGE as the computational desideratum. It posits that unstructured parentheticals, assumed to belong to the CP category, undergo not MERGE but FormSequence (FSQ), a complex procedure consisting of FormSet (FST) and Sequencing in Narrow Syntax (NS). Furthermore, alongside binary Simplest MERGE, Universal Grammar (UG) incorporates FSQ (= FST + Sequencing) as a computational tool. This tool accommodates $n \geq 3$ SO inputs with categorially identical conjuncts and a conjunctive operator &, potentially serving as a source of unique semantic interpretation (e.g., list reading). This contribution enhances understanding of UG by demonstrating that FSQ facilitates the appropriate SEM representation sent from NS to discourse grammar.

Keywords: FormSequence, FormSet, Simplest MERGE, Parentheticals

シーケンス形成による非構造的挿入句の派生案

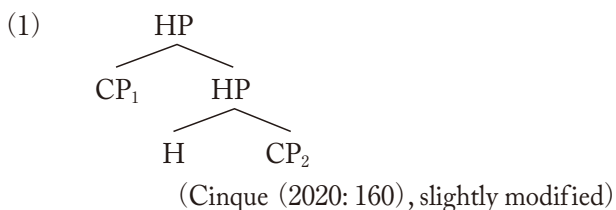
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要旨: 本稿では単純併合を想定するミニマリスト統語論の枠組みで非構造的な挿入句表現の統語論について検討する。具体的には、挿入句表現の統語範疇をCPと仮定し、顕在統語論における派生には併合ではなく、セット形成とシーケンス化からなるシーケンス形成が関与することを主張する。そして、普遍文法内には単純併合だけでなく、シーケンス形成という構造構築のオプションが存在し、その適用の結果、等位項と接続演算子&を持つ3つ以上の統語体のインプットにはリスト読みのような特殊なSEM解釈が付与される。これにより、可視統語論から談話文法への転送の際に適切なSEM表示を出力する余地が生まれる。

キーワード: シーケンス形成, セット形成, 単純併合, 挿入句

1. Introduction

In the field of generative syntax, it has been a shared tenet that sentences are generated by successive application of MERGE, innate to the human linguistic computational system. Since Chomsky (1995), MERGE has been formulated in the simplest form, and thus is referred to as Simplest MERGE, which is restricted by third-factor toolkits as well as language specific constraints.¹ One of the trivial consequences of such toolkits is to restrict the input of MERGE to be binary. However, this results in a difficult challenge when dealing with unstructured linguistic expressions, as has been much argued in the literature. Discourse expressions are typical instances and thus should continue to be closely examined in terms of the MERGE-based Universal Grammar (UG). Concerning this issue, Cinque (2008, 2020) provides the guiding hypothesis that, as a natural consequence of Kayne's (1994) Linear Correspondence Axiom, sentences in common discourse are predicted to form an antisymmetric structure schematically represented in (1), where H is a functional head functioning as the source of antisymmetry.



Although it is desirable to assume (1) as a null hypothesis so long as third-factor binarity thoroughly governs sentence grammar, (1) raises a number of questions. At the outset, there is no reasonable evidence to support the possibility of a bottom-up derivation where an optional propositional syntactic object (SO), CP₂ in this case, merges first with H unless H carries anything like θ -role which determines CP₂ to be merged with. If the SOs available in the derivational Workspace (WS) are both full CPs, it is then predicted that the computation Σ cannot differentiate them for the purpose of deciding the structural dominance between them in (1). That is, the building pattern of the discourse structure in (1) is not fixed, remaining unclear why CP₂ comes first and vice versa and running afoul of the

computational principle of Determinacy, which strictly requires structural changes to be unique given the limit of available resources and conditions holding for WS (cf. Chomsky 2019a). Second, also concerning the fundamental structuring of linguistic units, MERGE-based duality of semantics has no responsibility to accommodate the occurrence of discursive linguistic units. See (2), adopted from Chomsky (2021b: 18).

(2) *Duality of Semantics*

EM [External MERGE (YT)] is associated with θ -roles and IM [Internal MERGE (YT)] with discourse/information-related functions.

Suppose that H in (1) is similar to a conjunctive, which fails to provide θ -roles as mentioned above, in coordinate structures; then the complement and specifier positions where the conjuncts occur are neither A nor A'-positions. Thus, there is no room for MERGE to bleed the apparent departure of (2) and we should either conceive an alternative device or to extend the notion of Simplest MERGE to resolve this dilemma. Third, although it might seem somewhat paradoxical, the null hypothesis where discursive structures are antisymmetrically formed is likely to be refuted by a set of descriptive facts, for which (3) is a good example. It is widely reported in the literature that the English non-restrictive relative clause (NRC) is a kind of discursive construction with a parenthetical form.²

- (3) a. It may clear up, in which case would you mind hanging the washing out?
 b. He said he'd show a few slides towards the end of his talk, at which point please remember to dim the lights!
 (Huddleston and Pullum (2002: 1061))
 c. My friend, who God forbid you should ever meet... (Cinque (2020: 153))

Compared with the restrictive relative clause (RRC), English NRCs show characteristics of an independent clause. For example, they can be illocutionarily independent from a matrix clause. The relative CP in (3a) carries a question force, that in (3b) carries an imperative force, and that in (3c) carries an optative force. However, once we assume the NRCs to be structurally dominated (*integrated* in Cinque's term) by

their host clauses, there arises a risk of losing an explanatory source to derive the independent nature. We review the other related facts in Section 2.

With these research questions in mind, the central issue of this paper is to motivate a computational device to produce unstructured linguistic units, namely FormSequence proposed by Chomsky (2019b, 2020, 2021a, 2021b, 2022). Adopting parentheticals as the main target of consideration, I attempt to elucidate the technical details of the device, arguing for its necessity in Narrow Syntax (NS) to render the parenthetical SOs into unstructured units licit for interpretation at the SEM system. Consequently, it shows that the third-factor efficiency imposed on MERGE, often incarnated as the concrete notions of binarity and cyclicity, still supplies a desideratum of the computational system without departing from (2).

We will proceed as follows: Section 2 provides a set of parenthetical data whose behaviors are closely connected to discourse, as evidenced by their conflicting (dis-)continuity from the host clause. Section 3 provides a brief introduction to FormSequence, and later in this section, it is revealed that several aspects of the device remain to be elucidated. Section 4 proposes an alternative approach to parentheticals based on FormSequence. I first explicate the details of the proposal, then argue for how the facts shown in Section 2 are accommodated under the proposal. Section 5 concludes this article.

2. The Facts

This section provides a set of parenthetical data that highlight properties that are hard to derive solely resorting to binary Simplest MERGE. The data to be provided demonstrate that the continuity of parentheticals with their host clauses is rather conflicting. Here, I define parentheticals as inserted expressions with intonation breaks that add secondary information to the host clause, such as familiar phrasal appositives, NRCs, and other supplementary uses, as illustrated in (4-7) below.³

(4) *Phrasal Appositives*

- a. John, a great chess player, likes Mary.
- b. John—we all know this—is a great chess player.

c. John, as we all know, is a great chess player.
(Kluck, Ott, and Vries (2015: 1))

(5) *NRC*

- a. Sheila was beautiful, which was too bad. (Ross (1969: 357))
- b. John, who is a great chess player, likes Mary.
(Kluck, Ott, and Vries (2015: 1))

(6) *Parenthetical Use of Adverbs*

- a. I am (honestly) interested (*honestly) in what you're up to.
- b. I am (, honestly,) interested (, honestly,) in what you're up to.
(Kluck, Ott, and Vries (2015: 7),
underscores in original)

(7) *Parenthetical Use in Free Indirect Discourse*

- a. Paolo, thought Maria, hoped that Gianni would leave as soon as possible.
- b. *Paolo hoped that Gianni, thought Maria, would leave as soon as possible.
(Giorgi (2012: 8), slightly modified)

2.1. Discontinuity of Parentheticals with Host Clauses

There have been extensive discussions on both the internal and external syntax of parentheticals, with attention to their syntactic commitment to the host clauses. One plausible observation is that parentheticals behave like a *syntactic orphan* to their host clauses, hence no hierarchical relation is attested between them (cf. Haegeman (1991) a.o.). A convenient benchmark for this is to confirm the lack of a c-command relation between parentheticals and their host clauses. (8) is an instance of a supplementary parenthetical where the bound pronoun *him* cannot refer to *every professor* because the latter does not c-command the former.

- (8) Every professor, I really like him_{i/j}, has written many books.
(Kluck, Ott, and Vries (2015: 5),
underline in original)

Likewise, English-type NRCs in general support this view, as demonstrated in (9), where we can find a failure of *didn't* in the host clause to license the negative polarity item (NPI) *any*.⁴

(9) * I didn't see a man, who had had any drinks.

(Nakamura and Kaneko (2002: 80))

Another benchmark for the discontinuity with the host clause is unextractability from inside a parenthetical to the host clause. (10a) contains the parenthetical from which the interrogative DP *which book* is extracted, and (10b) is its NRC counterpart.⁵

(10) a. * Which book_i did the professor—assuming that the students only read t_i —spent a lot of time explaining the course materials?

(Kluck, Ott, and Vries (2015: 4), slightly modified)

b. * Which book_i did the professor, who assumes that the students only read t_i , spent a lot of time explaining the course materials?

(Josh Bowers (personal communication))

On the other hand, it is interesting to note that we can see stark contrast in the case of anchored parentheticals such as (11c, 12c), where the anchoring head (*George* in (11) and *which linguist* in (12)) undergoes A'-movement leaving behind the parenthetical (*his best friend* in (11) and *people who study language* in (12)).

(11) a. Peter met George, his best friend, in primary school.

b. George, his best friend, Peter met in primary school.

c. * George_i Peter met t_i , his best friend, in primary school. (topicalization)

(12) a. You met three linguists, people who study language, yesterday.

b. Which linguists, people who study language, did you meet yesterday.

c. * Which linguists_i did you meet t_i , people who study language, yesterday? (wh-movement)

(Kluck, Ott, and Vries (2015: 5))

The next piece of evidence is the invisibility from being the target of *one*-substitution and VP-ellipsis. McCawley (1988) observes interesting contrasts between RRCs and NRCs. The pronominal *one* in (13a) refers to the bracketed NP and RRC, but that of (13b) refers only to the NP, excluding the NRC. Likewise, NRCs cannot be the target of VP-ellipsis either, as demonstrated in (14a-b) (see also Hayashi (2018)).⁶

(13) a. Tom has [a violin which once belonged to

Heifetz]_i, and Jane has one_i too.

b. Tom has [a violin]_i, which once belonged to Heifetz, and Jane has one_i too.

(McCawley (1988: 445), slightly modified)

(14) a. John sold Mary, who had offered him \$600 an ounce, a pound of gold, and Arthur did Δ too. (Δ = ^{OK} sell Mary a pound of gold / * sell Mary, who had offered him \$600 an ounce, a pound of gold)

b. John sold a violin, which had once belonged to Nathan Milstein, to Itzhak Perlman, and Mary did Δ too. (Δ = ^{OK} sell a violin to Itzhak Perlman / * sell a violin, which had once belonged to Nathan Milstein, to Itzhak Perlman)

(McCawley (1988: 450), slightly modified)

The final evidence demonstrating the structural independence of parentheticals from the host clause comes from the fact that NRCs can have a split antecedent, as shown below, adopted from Cinque (2020): the English relative pronoun *which* in (15) co-refers to *muffins* and *scones*, and that of Italian in (16) *i quali* 'who' co-refers to *Carlo* and *Anna*.

(15) Kim likes muffins_i, but Sandy prefers scones_j, which_{i,j}/*that they eat with jam.

(Cinque (2020: 154))

(16) Se Carlo_i non amava più Anna_j, i quali_{i,j} d'altra parte if C. no longer loved A. who at. any. rate non si erano mai voluti veramente, una ragione c'era they. really. never-PAST loved really. good a reason there. was 'If Carlo no longer loved Anna, who at any rate loved each other, there was a reason.'

(Cinque (2020: 148), gloss modified)

If relative pronouns in NRCs are E-type pronouns, then they do not require structural binding from their antecedent, as has been widely known since Evans (1980), hence suggesting that the NRCs do not form a hierarchical structure.

2.2. Partial Continuity with Host Clauses

If the parentheticals exhibit complete independence from their host clauses, it would be concluded that NS has nothing to say about at least their external syntax, period. However, the situation that we face appears more complicated. The first evidence to demonstrate the

relevant continuity comes from a sharp contrast to the accommodation of parasitic gaps between NRCs and regular RRCs. See (17b) for an English NRC case and (18) for a case of Italian *il quale* ‘who/which/that’ NRC:

(17) a. John is a man who everyone knows pg_i admires t_i .

b. *John is a man who Bii, who knows pg_i , admires t_i .
(Safir (1986: 673))

(18) *Una persona_i che i Rossi, i qual_i conoscono pg_i bene, hanno
one person that the R. who know well have
sempre ammirato t_i è Gianni
always admired is G.

Intended reading: ‘One person that Rossi, who knows well, has always admired is Gianni.’

(Cinque (2020: 151))

On the hypothesis that parasitic gaps are not c-commanded by real gaps (cf. Taraldsen (1981)), it would be predicted that (17b) and (18) are acceptable just as (17a) where pg is not c-commanded by its real gap in the object position of the upper relative clause. However, this is not the case. Rather, the attested contrast implies that NRC examples would be more continuous to the matrix host clause more than the RRC example. Nevertheless, if we stick to the binary MERGE of NRC with the host clause, the contrast would never be reconciled. Otherwise, the necessity would arise of expanding the notion of Simplest MERGE.

Second, Kluck, Ott, and Vries (2015: 13) provides (19) as an instance where parenthetical-internal stripping takes place.

(19) John—and Bill Δ too—loves Mary Poppins.

Given the widely accepted identity condition for ellipsis, the elided part marked as Δ forms a parallel to that of the host clause. Σ compares the parenthetical VP with the antecedent in the host clause and cues PHON (PF)-deletion. Thus, it turns out that the parenthetical in (19) must be visible from the host clause, which apparently contradicts the descriptive generalization derived in the previous section.

Third, another fact that reinforces the contradictory continuity of parentheticals with the host clause also comes from the order-unconstrained manner of adverbs of the speaker’s attitude toward the host proposition. The relevant instances are repeated here in (20).

(20) a. I am (honestly) interested (*honestly) in what you’re up to.

b. I am (, honestly,) interested (, honestly,) in what you’re up to.

(Kluck, Ott, and Vries (2015: 7))

Kluck, Ott, and Vries explicate the contrast, arguing that while the attested use of *honestly* in (20a) “restricts the meaning of the predicate (p.7)”, the parenthetical options in (20b) can “tell something about the entire speech act (*Ibid.*).” Given the assumed semantic roles of CP projection (cf. Giorgi (2012)), it is implied that the parenthetical adverbs interfere with the host CP projection, consequently demanding the merger of parentheticals with the host clause.

The same analogy may possibly be applied to parenthetical use in Free Indirect Discourse (FID), which Giorgi (2012) extensively discusses. See (21a-b) again.

(21) a. Paolo, thought Maria, hoped that Gianni would leave at the earliest.

b. *Paolo hoped that Gianni, thought Maria, would leave at the earliest.

(Giorgi (2012: 8))

According to Giorgi (2012), FID is a form of stylistics frequently adapted in literary works that “gives the reader the impression of listening directly to the thoughts, or to the speech, of the main character in the narration (p.8).” In the above paradigms, the parenthetical use of *thought Maria* has a stylistic effect of encouraging the better understanding of *Maria’s* thought. If the parentheticals involve the interpretation of the whole sentence with the structural involvement with the matrix CP projection of the host clause, the acceptability of (21a) naturally follows. Conversely, as Giorgi argues, the unacceptability of (21b) also receives a natural explanation because the occurrence of the parenthetical in (21b) forces the interpretation where it is structurally related to the embedded CP projection of the host clause.

2.3. Forming a Bridge to Discussion in Section 3

In Section 2, we have reviewed conflicting structural data as to whether parentheticals form continuity with their host clauses or not—in other words, their (in-) visibility from their host clauses. Below is a summary of

the last two subsections.

(22) Table 1: Evidence against or for Parenthetical Continuity with Host Clauses

<i>Evidence against continuity with host clauses</i>	<i>Evidence for continuity with host clauses</i>
(i) No c-commanding - No pronominal binding (8) - No NPI licensing (9)	(i) No parasitic gap licensing (17b), (18)
(ii) No extraction from parentheticals -NRC (10b) - Anchored parentheticals (11c), (12c)	(ii) Parenthetical-internal stripping (19)
(iii) Inability to be elided (NRC) - <i>One</i> -substitution (13b) - VP-ellipsis (14b)	(iii) Commitment to speech act via host CP projection - Adverbs of speaker's attitude (20) - Parenthetical use in FID (21)
(iv) Split antecedent (NRC) (15-16)	

Prior to the full-fledged discussion in Section 3 as to what kind of computational device is suitable for accommodating the above facts, there still remains one task to evaluate how invisible parentheticals are compared with ordinary adjuncts. In fact, the following facts suggest that we should not adopt a highly parallel strategy for ordinary adjuncts. See (23-24) which contain RRCs, which we can safely say is a typical instance of adjuncts.

(23) *Interpretability within Matrix Determiner Scope*

- a. every girl that Mary saw
b. $\forall_x [\text{girl}(x)\text{Mary} \wedge \text{saw}(x)]$

(24) *Ability to Reconstruct Antecedents (e.g., Condition A)*

- the picture of himself_i [Op_i] that John painted t_i
(Alexiadou, Law, Meinunger, and Wilder (2000: 5-7), slightly modified)

These facts suggest that RRCs can be structurally accessible from the matrix clause at SEM. On the other hand, NRCs exhibit the opposite result to (23-24). Matrix determiners cannot scope over the NRC evidenced by (25), and reconstructing the antecedent with the reflexive does not mediate Condition A evidenced by (26).

(25) I called those two patients, who every doctor will examine. [$*\forall > 2$]

(26) *?That portrait of himself_i, which John_i painted last year, is expensive.

(Alexiadou, Law, Meinunger, and Wilder (2000: 32))

The most plausible approach to accommodate the structural invisibility/discontinuity of parentheticals would be to adopt the same computational tools as

adjuncts like RRCs, such as Pair-Merge of Chomsky (2004) and strong version of Transfer which renders the entire phase, including the head and edge (s), inaccessible (e.g., Uriagereka (1999), Obata (2017)). However, the stark contrast makes us hesitate to go along this direction. Actually, various proposals unique to parentheticals have been proposed in the history of generative syntax from the transformational grammar to the recent minimalist framework. Such works as Vries (2006, 2012), Gobbo (2017), and Hayashi (2018) each provide a concise yet thorough review of related leading research, so I do not find any necessity to do the same here; see also note 4. Before leaving this section, I round out the main discussion to be provided in the following sections. I find it safe to say that most of the influential proposals have something in common, namely availing oneself of *binary* External/Internal MERGE as a non-substitutable means for structure building. Such a restriction entails devising a unique variant of MERGE without generating c-command relations between parentheticals and the host clauses in either a direct or an indirect manner by deploying some discursal-specific projection. Other approaches posit a counter-cyclic MERGE of parentheticals to the host clause. Eventually, the necessity to devise these extensions stems from the tenet that MERGE is constrained by the third-factor principle of *binarity*, which entails constituency and visibility among input SOs. Of course, the departure from this tenet runs the risk of complicating the whole organization of UG based on the Simplest (thus binary)

MERGE. Hence, it is the most desirable to derive the parenthetical issues adduced above uniquely from some probable common device in a manner parallel to other similar phenomena. Meanwhile, the examination of leading research suggests the existence of an empirical property that can be a good candidate for a plausible explanans: it is worth considering the possibility that intonation breaks, which parentheticals entails on both ends, play a crucial role in their external syntax, as noted in Potts (2005) and Gobbo (2017). Accordingly, I will entertain an approach that adopts a structure building device specific to non-structural linguistic units, namely FormSequence (FSQ), and the next section provides a brief introduction to FSQ and an assessment of the challenges that remain to be elucidated.

3. FormSequence: Mechanism and Challenges

3.1. FSQ for Unstructured Linguistic Expressions

As briefly argued in Section 1, the canonical MERGE-based organization of UG faces a serious difficulty in accommodating unbounded unstructured linguistic expressions like (27).

- (27) a. John, Bill, my friends, ... ran, danced, took a vacation.
 b. John, Bill, my friends, ... ran, danced, took a vacation.



(Chomsky (2021b: 31), slightly modified)

The agreement relations between each subject and predicate indicated by arrows *cannot* be guaranteed by the operation of regular structured set formation MERGE. Instead, Chomsky (2019b, 2020, 2021a, 2021b, 2022b) devised a solution, FSQ, which renders a structured SO into an unstructured linear sequence. FSQ is in fact a complex operation, as demonstrated in (28).⁷

- (28) *FormSequence* (FSQ)
- (i) $\&$, a , b , and c are independently present in WS:
 $WS = [\&, a, b, c]$
 - (ii) Apply FormSet (FST) ($\&$, a , b , c):
 $WS = [\{ \&, a, b, c \}]$
 - (iii) Apply Sequencing to $\{ \&, a, b, c \}$ after all the structure building operations are completed:

$$WS = [\langle \{ \&, a, b, c \} \rangle]$$

Taking (27) as an example, let us consider how (28i-iii) work. As practiced in the above works of Chomsky, one typical target case is semantically coordinate structures with or without an overt conjunctive (*and*/ $\&$) appearing in WS. At the stage of (28i), (27) is expected to have $WS = [\textit{John, Bill, my friend, ran, danced, took a vacation, \&, \&}]$. The next step is to apply FST to WS, giving the structured set $\{ \&, a, b, c \}$ in WS. Concerning the relevant FST operation, one might be skeptical about the necessity to adopt FST instead of MERGE for set-creation. I would argue that it has two forms of support in terms of theoretical coherency. First, the conjuncts of conjunctive $\&$ do not form grammatical relations covered by the duality of semantics in terms of MERGE. See (29), adopted from (Chomsky (2021b: 18)):

(29) *Duality of Semantics*

EM is associated with θ -roles and IM with discourse/information-related functions.

It is safe to say that conjunctives assign no θ -roles to the conjuncts. This means that there is no room for MERGE to mediate the conjunctive relations without extending the notion of (29), which entails a risk of complicating Simplest MERGE as a core computational device. Second, as sharply spelled out in Goto and Ishii (2021) and Omune (2021), there is no compelling reason to stipulate that the third-factor principle, which constraints the input of MERGE as binary, excludes the possibility where FST takes $n \geq 3$ as inputs. Thus, it is not surprising that the conjuncts undergo FST instead of MERGE together with the conjunctive, forming the SOs $\{ \&, \textit{John, Bill, my friend} \}$ and $\{ \&, \textit{ran, danced, took a vacation} \}$ in the example case. Interestingly, Chomsky argues that it is the adoption of not MERGE but FST that enables the set reading attested in (27). Finally, after all the structure-building operations take place in WS, Sequencing is applied to the SO in a *countercyclic* manner, giving $\langle \&, \{ \textit{John, Bill, my friend} \} \rangle$ and $\langle \&, \{ \textit{ran, danced, took a vacation} \} \rangle$, where there is no c-commanding among any of the terms. Note that FSQ is a SEM-oriented operation in that it ensures that the SOs are both sequential and parallel in nature, without guaranteeing the eventual externalization of the SOs at

PHON. This is empirically suggested by the fact that the coordinator & is usually phonetically realized in front of last conjuncts. The role of FSQ in NS gives SEM an input SO whose interpretation becomes sequential, namely the list reading, only if the number of subjects and predicates is identical as well as when a phrase such as *respectively* or *in that order* is added to the SO in some form (cf. Chomsky (2022b: 1:00:11), also cited in Hayashi (2022)).⁸ Leaving aside the technical details of morphological processing taking place in PHON, the expected agreement relations between each subject and predicate can be mediated in terms of the linear closeness.

3.2. Remaining Challenges for FSQ: Why and How?

Although Chomsky (2022a) oscillates in balancing the mitigation and integrity of MERGE-based grammar, FSQ is strongly demanded as a viable structure-building device to meet both explanatory and conceptual adequacy. As emphasized in the previous section, Sequencing in the composite FSQ is, critically, countercyclic, thus necessarily bleeding another third-factor principle, the No-Tampering Condition of Chomsky.

(30) *No-Tampering Condition* (Chomsky (2007: 8))

Suppose X and Y are merged. Evidently, efficient computation will leave X and Y unchanged [...(YT)].

Let us focus on this problem more deeply, beginning by examining the *why* question about FSQ. See (31b-d) for how (31a) is derived in an FSQ account.

- (31) a. Which opera did the critics hate and the audience love?
 b. {&, {the critics, {INFL, {v*-hate, which opera₁}}}, {the audience, {INFL, {v*-love, which opera₂}}}}
 c. did, {&, {the critics, {INFL, {v*-hate, which opera₁}}}, {the audience, {INFL, {v*-love, which opera₂}}}}
 d. which opera₃, {did, <{&, {the critics, {INFL, {v*-hate, which opera₁}}}, {the audience, {INFL, {v*-love, which opera₂}}}>}}

(31b) represents the stage where FST forms a ternary set. Then, after *did* undergoes EM to the structure in (31c), the IM of *which copy* to its Spec takes place

without triggering any contradiction because at this moment we have only sets, so it is available to extraction. This is a substantial benefit that leads to toleration of the countercyclic nature of FSQ. Suppose that we have Pair-MERGE, also a device for creating linear units, instead of FST in (31b); there is then no moment to extract *which opera* in the conjuncts because the sequencing effect of Pair-MERGE is deemed immediate.⁹ Then, (31d) illustrates the final input sent to SEM, where Sequencing of FSQ has countercyclically applied to the coordinated ternary set. Given the widely accepted notion of operator-variable constructions, the topmost copy *which opera₁* must c-command the lower variable copies *which opera₂* and *which opera₃*. If the sequential unit that contains the two lower copies were insensitive to sequence-external c-commanding by *which opera₃*, (31a) would not be accommodated. In fact, this is not the case, as evidenced by the acceptability of (31a). Thus, the countercyclic nature of FSQ should be tolerated.

On the other hand, however, even if the necessity is defensible, the *how* question remains to be elucidated. Chomsky (2021b) advocates its countercyclicality, arguing that “there is basically no different from valuing an embedded feature at the phase level (p.33, fn.51)”, but giving no decisive mechanism. What Σ hunts for in order for FSQ to be executed on the intended domain remains unclear.

4. Proposal: Parentheticals as a Limiting Case of CP Sequence

In this section, I argue for a new approach to parentheticals that adopts FSQ. The gist of this alternative approach is briefly summarized as follows: First, parenthetical CPs are structured independently of each other and labeled based on canonical patterns. These patterns are namely {C, X} for cases such as (4), (6), (7), or {CP_{[ϕ], XP_{[ϕ]} for case (5), as predicted by Labeling Algorithm (LA) of Chomsky (2013, 2015) (= (32a)). Then, they undergo FST with their host clauses and a conjunctive head K in the sense of Potts’s (2005) comma head and Giorgi’s (2012) intonation break head (= (32b)). When the derivation reaches the very end of the CP projections, Σ detects the whole}}

unlabeled set that contains K, a parenthetical CP, and its host CP, then cues Sequencing of the terms. Below is a schematic illustration of the proposal (=32c).

(32) *FSQ Approach to Parentheticals*

a. *Independent Structure Building and Labeling of*

CP_{host} and CP_{par}

$WS = [K, \{_{CP_{host}} C, \{\dots\}, \{_{CP_{par}} C, \{\dots\}\}]$

b. *FST(K, CP_{host}, CP_{par}) without Being Labeled*

$WS = [\{K, \{_{CP_{host}} C, \{\dots\}, \{_{CP_{par}} C, \{\dots\}\}]$

c. *Sequencing the Unlabeled Whole SO*

$WS = [\langle K, \{_{CP_{host}} C, \{\dots\}, \{_{CP_{par}} C, \{\dots\} \rangle]$

4.1. Technical Details and Motivation

In the first place, our inquiry into FSQ begins with the question why Σ recognizes the domain to be sequenced. In this regard, I find it necessary to remark on the unlabeled nature of coordinated sequential sets. Goto and Ishii (2021) state that candidate SOs for sequencing cannot be labeled by the LA, and I follow this view because SOs with more than two terms, namely those formed by FST and not MERGE, are too complicated for LA to unambiguously decide the label of the whole SO. See (33).

(33) $\{ \&, a, b \} \rightarrow \{_{p} a, b \}$

Taking a simple coordination case, suppose $\&$ = conjunctive, $a = XP$, $b = YP$, and XP and YP contain the same categorial head. It is standardly assumed that LA resorts to two means of deciding the label of an input SO. However, whichever means is taken, (33) cannot be labeled. First, it is not possible to resort to the antisymmetry attested in the “head-complement” relation as in $\{H, XP\}$ because FST does *not* result in the ordinary structural distinction of “head-complement-specifier,” which the regular application of MERGE produces, thus predicting neither $\&, a$ (XP) nor b (YP) to be the target of labeling in the hypothetical case. Second, detecting the most salient feature would not be available in this case because positing some salient feature among $\&, a$, and b is obviously a hindsight idea that requires careful examination to compensate for the conceptual inadequacy.¹⁰ Therefore, the unlabelability is determined in this case, which departs from Chomsky’s (2013, 2015) conjecture that labels are necessary for SOs to be interpreted at the interfaces.¹¹ If so, then it allows

room to assume that Σ induces an irregular treatment of semantic information of SOs to SEM when they are unlabeled. Let us further examine the linkage of unlabelability and FSQ in terms of the identity condition imposed on the conjunct SOs, which is expected to derive the Coordinate Structure Constraint. It can be safely said that labels serve as a hallmark of the antisymmetric endocentricity of SOs, whereby Σ unambiguously accesses an item and looks into it as long as Resource Restriction allows to fulfill the computational purpose in NS, covering regular structure-building cases by binary MERGE.¹² Conversely, it is also reasonable to say that unlabeled SOs formed by FST ($n \geq 3$) lack such antisymmetric endocentricity, rather than to say that they can incur the violation of Full Interpretation at the Interfaces. Thus, there is no clue for Σ to unambiguously affect the whole of symmetric sets without labels, so the plausible option allowed is to apply Sequencing of FSQ to the whole set, and as a result, the unlabeled part is sent, still sequential, to the SEM system.

(34) *Regular Antisymmetric Labeled Set Created by MERGE*

$\{_{\alpha P} \alpha, \beta \}$

$\rightarrow \alpha P$ can be a target of further cyclic MERGE because Σ unambiguously select α in the set.

(35) *Irregular Symmetric Unlabeled Set Created by FST*

$\{ \alpha, \beta, \gamma \}$

\rightarrow Neither α, β , nor γ can be a target of further cyclic MERGE because Σ cannot unambiguously select each in the set.

Consequently, the sequential unit receives a different manner of interpretation at the SEM system from structured linguistics units. See (36) to grasp how this proposed model is derived.

(36) a. FST \rightarrow Unlabeled by LA \rightarrow Sequencing (= FSQ) \rightarrow SEM Interpretation

b. NS: FST predicts unlabeled SO, then the computation Σ applies Sequencing triggered by the conjunctive operator $\&$.

$WS = [\langle \&, \{_{\alpha\dots}, \{_{\beta\dots}, \{_{\gamma\dots} \rangle]$

\downarrow *Transfer applies.*

SEM: Interpretation does not recognize hierarchical structures, checking if

identities hold among SOs.

$\langle \&, \{\alpha \dots\}, \{\beta \dots\}, \{\gamma \dots\} \rangle$ (where α , β , and γ are categorially identical)

Departing from Chomsky (2021b: 32), who claims that merging of $\&$ and FSQ generates a sequential unit, I assume here that $\&$ functions as a conjunctive operator that triggers Sequencing to the categorially identical XP terms α , β , γ and itself in (36b). Again, FSQ is a SEM rather than PHON-oriented operation in that it ensures both sequential and parallel natures of the SOs, thus the peculiar unlabeled nature as well as strict identity restriction imposed on the SOs excluding $\&$ can be explained as being tolerated when FSQ is applied.^{13,14} Then, an illicit extraction from there, which Chomsky treats as the violation of the identity condition, can be explained as an indetermined computation which would be hard to compensate for why the extraction of other terms is not selected due to its sequential nature.

Next, concerning the categorial status of parentheticals, I assume that irrespective of their surface forms, they are basically CPs unless there is conflicting evidence. I see the need to add some empirical supports regarding instances apparently hard to recognize as CPs. To this end, I adopt Döring's (2015) diagnosis to determine whether putative parentheticals can accommodate sentential adverbs, namely lexical items that represent speech act force, structurally governed around the CP layer.¹⁵ We can then deduce their qualification as CP from the ability to carry the adverbs. Indeed, this is the case. See (37a-d), where the adverbs are italicized.¹⁶

- (37) a. Usain Bolt is—*probably* for different reasons—the fastest man of the world.
 b. Usain Bolt—*maybe* very purposefully—increased his speed.
 c. I saw somebody, *maybe* Usain Bolt.
 (Original adopted from Döring (2015:112-113))
 d. Paolo, *probably* thought Maria, hoped that Gianni would leave as soon as possible.

Now, let us focus on the status of the operator K head in the FSQ model. As briefly reviewed in Section 2.3, the constant appearance of intonation breaks before and after parentheticals has provoked many intriguing attempts to capture this structural discontinuity. Among those, Potts's

(2005) Comma Phrase (CommaP) system influenced subsequent studies like Giorgi (2012) and Gobbo (2017) in various ways. Giorgi develops her comma head K structure for parentheticals, as illustrated in (38):

- (38) [_{KP} K [_{parentheticals} (YT) [_{KP} K [_{IP(=host clause)} ...]]]]
 (Giorgi (2012: 11), slightly modified)

There are two K heads in (38) because there are two intonation breaks around parentheticals. While the lower K takes a host clause as its complement, the complement slot of the higher K head is occupied by the SO that contains parentheticals and the lower KP.¹⁷ Furthermore, (38) is couched somewhere in the CP layer, which governs the speaker's attitude towards the proposition so that it can accommodate such cases as (21) in Section 2.2. Although very attractive as admitted herself as well, the SEM nature of the prosodic formative head K seems to be ad hoc in nature in that it is assumed that K is a prosodic formative that enables the 'syntactic permeability' in Giorgi's term where K takes either a phrase that includes a parenthetical or a host clause as its complement. Drawing on this insight, I instead propose that the K head has the same function as the conjunctive operator head $\&$, which invokes FSQ to assemble a parenthetical, its host clause, and the K head into a single set. Note in passing that this approach does not contradict Giorgi's original insight that the K head does not take part in any subordinating relation with the other SOs naturally deduced from its non-binary nature, as argued in Section 4.1. If the participants of the set $\{K, \textit{parenthetical}, \textit{host clause}\}$ do form any c-command relation among them, it automatically follows that no subordinating relation notated as "host > K > parenthetical" is naturally predicted.

So far, it has been argued that unstructured linguistic units like coordination become a target of FSQ and the parenthetical in general as CP forms a set with the host clause and the K head. According to Chomsky's (2021b) remark, "wherever there is an XP, it is the limiting case of a sequence [...(YT)] (p.30)," it follows that the parentheticals and the host clauses are regarded as part of a continuous sequence. However, the case at hand obviously differs from typical cases of unstructured expressions argued in the literature, in that CP is a

propositional unit that includes the contextual layer. On the FSQ hypothesis for parentheticals, it is predicted, contrary to Cinque's (2008) antisymmetric view of discourse grammar, that multiple CP occurrences are mediated in a linear relation at the discourse level.¹⁸ This is a favorable consequence because it can rule out the suspicious bottom-up building that we saw in Section 1 entailed by the installment of the antisymmetric model. That is because under the FSQ model, the second proposition, which contains a discursial pronoun, and the first proposition, which contains its antecedent, are first derived in a parallel manner and then later formed as a single sequence, fortunately avoiding the contradictory assumption that the second proposition comes first as the complement of the functional head pending the merger of the first proposition to the discourse structure. See (39a-b), where the NRCs, whose discursial antecedents are contained in the host clauses, occur across sentential boundaries.

- (39) a. She borrowed a history book. Which suggests that her teacher was having some influence on her.
 b. (Speaker A) You said 12 till 10.
 (Speaker B) Which is fine, isn't it?
 (Cinque (2020: 153))

Furthermore, we can derive another favorable consequence of adopting FST instead of MERGE for the relevant case. As reviewed in Section 3.1, FST can be a source of the inducement of list reading in coordinated sets. If we adopt FST for the parenthetical cases, it is then naturally expected that the same or similar effect is found as well. See (40), where the NRCs exhibit the characteristics of Root Transformation: (40a) is an instance of negative constituent preposing while (40b) is an instance of tag-question.

- (40) a. This car, which only rarely did I drive, is in excellent condition.
 b. I just ran into Susan, who was your roommate at Radcliffe, wasn't she?
 (Hooper and Thompson (1973: 489-490))

If we assume that these characteristics are attributable to the syntactically independent status of the parenthetical NRC, it is FSQ that enables them to hold this status. In

particular, the putative linear proximity that is attested between *wasn't* in the tag question and the predicate *was* in the second NRC can be safely endorsed by the linear sequence formed by FSQ.¹⁹

In the next section, we will consider how other cases of structural discontinuity between parentheticals and the host clauses are treated under the FSQ approach.

4.2. Deriving Discontinuity

4.2.1. No C-Commanding

The first set of paradigms that suggests no involvement of c-commanding between the parenthetical and the host clause as evidenced by the failure of licensing pronominal binding and NPI such as (8) and (9). Under the FSQ account, each receives the following structure in (41-42) at SEM.²⁰ After the application of Sequencing of FSQ at NS before transferred to EM, the italicized binders cannot antisymmetrically c-command the underscored bindee, predicting the attested acceptability.²¹

- (41) <K, {_{CP} Every professor, has, written, many books}, {_{CP} I, really, like, him}>
 (42) <K, {_{CP} I, didn't, see, a man}, {_{CP} who, had, had, any drinks}>

I think now is suitable to argue why NRCs are able to host split antecedents. Let us consider this with (15) as an example. Each clause takes part in the set as an independent sequence. Thus, no c-commanding relation holds among them, and thus the E-type relative pronoun *which* can ambiguously refer to both of the two antecedents *muffins* and *scones*.

- (43) WS = [{K,
 (SO1) {C, {Kim, {INFL, {v-likes {muffins;}}}},
 (SO2) {C, {Sandy, {INFL, {v-prefers {scones;}}}},
 (SO3) {which_{i,j}, {they {INFL {v-eat {with jam}}}}}]]

4.2.2. No Extraction

Our consideration of the impossibility of parenthetical-internal extraction begins by comparing it with the licit case of extraction exemplified in (44).

- (44) Which opera did the critics hate and the audience love?

In Section 3.2, I mentioned that the wh-element *which opera* is displaced to the leftmost position by ATB movement. To spell this out more correctly, see (45),

which represents the derivational stage where the two conjuncts, which have the identical SO c that is a target of wh-movement, have just undergone FST, where n refers to the number of accessible terms in WS.

- (45) a. WS = [{ (&,) {a, c₁}, {b, c₂} }]
 b. $n = 7$ (a, b, c₁, c₂, {a, c₁}, {b, c₂}, { (&,) {a, c₁}, {b, c₂} })

Suppose that the computation Σ selects c_1 as the target of IM and merges it with the whole set, giving (46).

- (46) a. WS' = [{c₃, { (&,) {a, c₁}, {b, c₂} } }]
 b. $n = 8$ (a, b, c₂, c₃, {a, c₁}, {b, c₂}, { (&,) {a, c₁}, {b, c₂}}, {c₃, { (&,) {a, c₁}, {b, c₂} } })

Notice that IM is an option of Simplest MERGE and thus follows the efficiency condition of the third-factor principle, which renders its lower copy invisible for further computation. As a result, the number of accessible terms from (45) to (46) increases from 7 to 8, which correctly satisfies another principle, Minimal Yield.

(47) *Minimal Yield (MY)*

Structure Building by Simplest MERGE must increase the number of accessible terms in WS one by one. Otherwise, it would bring the risk of overgeneration.²²

However, it remains unclear: what mechanism renders c_2 in (46) invisible as well? As we have already seen in Section 4.1., citing Riny Huybregts, Chomsky argues that there are strict matching conditions imposed on the coordinate structure that compel Σ to extract all identical SOs from the conjuncts, consequently yielding the ATB effect. For concreteness, in the hypothetical case at hand, we could derive the same derivational result as (46) if Σ selected c_2 instead of c_1 for the target of IM. In the later derivational stage, FormCopy detects IM Configuration (IM Copy) between the higher copy c_3 and the lower copy c_1/c_2 , either of which becomes invisible.²³ Thus, it follows that the initial choice for IM is not relevant as long as the identity condition and MY are followed.

With this in mind, let us consider why the paradigms of (10a, b), (11c) and (12c) are ruled out. All the illicit instances above obviously differ from the licit instance (46) in that they involve inter-SO IM of the wh-elements. Adopting a schematic representation of their internal structure with abstracted notation for expository

purposes, let us consider why they are ruled out. Given the assumption that potential conjuncts undergo structure building in WS in a manner independent from each other, we have (48) before the application of FST.

- (48) a. WS = [(K,) {a, b}, {c, d}]
 b. $n = 6$ (a, b, c, d, {a, b}, {c, d})

Suppose that d is the hypothetical wh-element in those paradigms. As reviewed in Section 3.2., Sequencing SO by FSQ allows a moment where each term stays as a set object until Sequencing applies to them, so there is no compelling reason to rule out the IM of d at this moment. However, this is barred because it violates the third-factor condition MY. See (49) where MERGE ($WS, d, \{a, b\}$) applies to (48).

- (49) a. WS' = [(K,) {d₂, {a, b}}, {c, d₁}]
 b. $n = 8$ (a, b, c, d₁, d₂, {a, b}, {c, d₁}, {d₂, {a, b}}, {c, d₁})

Compared with the cases in (45-46), the number of accessible terms increases from 6 to 8, violating MY. This is because the IM is reminiscent of Sideward Movement of Hornstein (2001) and Nunes (2004), and the upper copy d_2 does not c-command the lower copy d_1 , leaving it visible for further computation. Thus, the failure of SO-internal extraction follows without needing to add any additional device to the computational system.^{24,25}

4.2.3. No Parenthetical-Internal Ellipsis

Next, let us look at how the FSQ account accommodates the invisibility of parentheticals from being the target of *one*-substitution and VP-ellipsis given in (13-14). As assumed earlier, suppose that (13b) is derived under the FSQ account while (13a) involves the merger of the relative CP to its antecedent. As a result, we obtain (50a, b) for (13a, b), respectively, before final Sequencing for the conjuncts of & (for the RRC case) or K (for the NRC case) takes place, respectively.

- (50) a. RRC
 WS = [{&, (SO1) {C, {Tom, {INFL, {v*-have, {a, {violin, {which, C, once, INFL, v-belong, to, Heifetz}}}}}}}, (SO2) {C, {Jane, {INFL, {v*-have, {one, too}}}}}} }]

- b. NRC
 WS = [{K,

adjunct SpecCP while leaving wh_5 in-situ as a parasitic gap. Second, the IM Copy created from γ to δ takes place in the matrix clause, raising wh_2 to the matrix SpecvP while rendering wh_3 into a real gap. Third, the IM Copy created across δ , ϵ , and ζ is a regular wh-movement that places wh_1 in the matrix SpecCP. On the other hand, the M-Gap is created between wh_2 and wh_4 .²⁶ Note that since the derivation proceeds in the strictly Markovian manner, INT cannot look at any derivational history, so the recognition of Copy is entirely independent from the actual execution of IM. Thus, as long as both wh_2 and wh_4 are visible in the single phasal cycle, it follows that INT can recognize them as Copies. With this in mind, we now consider how the contrast in the grammaticality observed between RRC and NRC as demonstrated in (17a-b) arises. Notice that concerning the derivation of RRC, I do not adopt the FSQ account, but tentatively assume the merger of a relative CP to the antecedent, predicting (53) for (17a).

$$(53) \quad \begin{array}{c} \text{M-Gap} \quad \text{IM Copy} \\ \text{a man } \{_{\beta} \text{ who}_1 \text{ C everyone } \{_{\delta} \text{ who}_3 \text{ who C } \{_{\gamma} \text{ knows who}_4 \} \{_{\alpha} \text{ admires who}_2 \} \} \\ \text{IM Copy} \end{array}$$

In (53) we find three IM Configurations associated with who . The formation of IM Copy $\langle who_3, who_4 \rangle$ takes place inside the deeply embedded RRC, moving who_3 in the SpecCP of δ while leaving who_4 in-situ as a parasitic gap. On the other hand, the other formation of IM Copy $\langle who_1, who_2 \rangle$ takes place inside the upper RRC, moving who_1 in the SpecCP of β while leaving who_2 in-situ as a real gap. Consequently, when the derivation reaches phase β , INT can recognize who_1 and who_3 as Copies in terms of M-Gap, thus explaining why (17a) is grammatical. Now, let us turn to the unacceptable instances of NRC of (17b). In this case, the FSQ account is adopted. See (54).

$$(54) \quad \text{WS} = [\langle \text{K}, \quad \begin{array}{c} \text{(SO1) } \{_{\beta} \text{ who}_1 \text{ C Bill } \{_{\alpha} \text{ admires who}_2 \} \\ \text{M-Gap } \times \quad \text{IM Copy} \\ \text{(SO2) } \{_{\delta} \text{ who}_3 \text{ who C } \{_{\gamma} \text{ knows who}_4 \} \dots \} \\ \text{IM Copy} \end{array} \rangle]$$

As with (53), the formation of IM Copy is executed in each SO in (54) as well. However, it is predicted that

INT fails to recognize $\langle who_1, who_3 \rangle$ as Copies in terms of M-Gap because each SO takes part in a distinct phase cycle in WS, thus being invisible to each other. That is why (17b) is ungrammatical.

Second, let us consider the parenthetical-internal stripping like (19). As argued in Section 4.2.3, I propose that the NRC is derived independently from the host clause before FSQ applies while the RRC is structured with its antecedent by means of Simplest MERGE. The difference implies the existence of a hypothetical principle of Resource Restriction in order to straightforwardly capture the elliptical ability.

(55) The search domain of the computation Σ for recycling/registering materials for SO deletion under identity is strictly limited to only single term SO at a time.

Now, let us confirm whether (55) is explicable to (19), whose internal structure is (56), as predicted by the FSQ approach.

$$(56) \quad \text{WS} = [\text{K}, \quad \begin{array}{c} \text{(SO1) } \{ \text{C}, \{ \text{John}, \{ \text{INFL}, \{ \text{v-loves } \{ \text{Mary} \\ \text{Poppins} \} \} \} \} \} \} \} \} \\ \text{(SO2) } \{ \text{C}, \{ \text{Bill}, \{ \text{INFL}, \{ \Delta \} \} \} \} \} \end{array}]$$

The dotted area in SO1 is the antecedent to be retrieved in Δ in SO2. Thus, all Σ has to do is simply search into SO1 without the necessity of cross-referring the two SOs. Thus, the putative contradictory possibility of allowing parenthetical-internal stripping can be derived under the FSQ approach by adding another third-factor principle for limiting the search space for the sake of efficiency.

Now let us turn our attention to the other fact that suggests the partial constituency of parentheticals with the host clause, namely commitment to speech act via host CP projection. The relevant instances are (20a-b) and (21a-b). First, a careful examination of the distributional patterns of *honestly* in (20a-b) implies the descriptive fact that such adverbs do not only require structural dominance by the root CP layer in terms of the canonical version of c-commanding but also linear proximity to the layer. Contrary to the fact, if they are required to be c-commanded by the root CP without being barred by a structural boundary, there would be no

way to accommodate (20b) with the comma parentheticals. Similarly, if licensing the adverb requires linear proximity to the root CP, it would be hard to give a reasonable explanation why (20a) with the adverb *honestly* following *interested* is ruled out while the parenthetical (20b) with the same distributional pattern is acceptable. Taken together, we should instead restate that there is some form of structural proximity between the root CP and the adverbs of speaker's attitude that is not strictly constrained by c-commanding. My hypothesis is that FSQ accommodates the attested variations in (20a-b). Suppose that (20b) is derived under the FSQ approach, then (57) holds as a state of WS before FST applies.

(57) WS = [K, {C_[root] I am interested in what you're up to}, {honestly}]

As argued in Section 4.1, I assume parentheticals to be CP in general, so the set {*honestly*} that is apparently a singleton set is in fact CP. Following the usual procedure, FST applies to (57), giving (58) where the two CP sets form a ternary set as a term structurally equivalent to the other mediated by the prosodical formative K. I propose this state of a ternary set is a requisite for licensing the adverbs of speaker's attitude by the root CP of the host clause. There is no antisymmetric c-commanding from the root CP to the adverb, but they are in the same set.

(58) WS' = [{K, {C_[root] I am interested in what you're up to}, {honestly}}]

When the derivation reaches the very end of the whole set, Sequencing takes place, rendering (58) into a linear unit and sending it to the SEM system.

In order to verify the above hypothesis, consider the FID case of (21a-b). Although it might seem challenging for the present approach to handle, in that the SO *thought Maria* occurs as a parenthetical in (21a-b), there is an opening breach to address with the FSQ approach. Suppose that the derivation of illicit (21b) differs from that of (21a) in that FST of the parenthetical targets the embedded CP of its host clause together with K, illustrated as (59).

(59) WS = [{K, {that Gianni would leave at the earliest}, {thought Maria}}]

Suppose that FSQ takes place contrary to its tolerated

countercyclic nature so that it applies after all processes for structure building are done; then the ungrammaticality of (21b) is naturally predicted because it does not form a ternary unit with the root CP.²⁷

5. Concluding Remarks

Our investigation began by questioning the theory that advocates the antisymmetric model of discourse grammar to which linguistic units sent from NS are structured in the same fashion as sentence grammar. It was argued throughout in this paper that unstructured parentheticals undergo not MERGE but FSQ in NS, whereby they receive licit interpretation at the SEM system. FSQ is in fact a complex procedure consisting of FST and Sequencing. I defended the position that in addition to Simplest MERGE constrained by the third-factor binarity, UG has FST as a computational tool which takes $n \geq 3$ inputs for structure building. Concerning an issue of the execution of Sequencing that has remained somewhat unclear in the literature, I attempted to tie it up with the constant unlabelability of the sets formed by FST. It was then shown that the conflicting properties of (dis-)continuity of parentheticals with their host clauses can be explained in terms of the FSQ approach without extending the notion of Simplest MERGE, thereby hopefully contributing to the further development of UG, in that FSQ forms a natural bridge from sentence grammar covered by NS to discourse grammar.

Before concluding this paper, I would like to remark on an intriguing comment regarding the nature of FSQ suggested by one of the anonymous reviewers: a number of the facts presented in the body point to a hypothesis that FSQ is a PHON/PF-side operation. Due to the space limitation, this possibility cannot be closely examined in this paper. For now, I can at least say that there is no compelling reason to assert the same about FSQ as a PHON-side operation either, because it would necessitate an explanation for why (17b) is ruled out as suggested by the reviewer. However, if we stand on the strict position SEM/LF and PHON are independent of each other (*pace*, for example, Bošković's (2011) theory of PF Rescue), the FSQ case applying to (60a-b) from Huddleston and Pullum (2002) suggests that the cue is

sent from the SEM side:

(60) a. I think it's legal, isn't it?

b. I don't think it's legal, is it? (*Ibid.*: 893)

Contrary to the canonical pattern of English tag-questions, the tag parts are in concord with the embedded clauses. According to Huddleston and Pullum, this is a result of the fact that communicative/discoursal demands, which should be handled at SEM, are preferred to the canonical grammatical reasoning. Although deriving such patterns might not be a part of I-Language as mentioned in note 8, it is plausible to say that Σ is designed to structure (60a-b) in a different manner from the ordinary MERGE if Determinacy holds. Furthermore, in order to derive unique interpretation like the list reading, the PHON approach struggles to justify the inclusion of a *respectively*-like lexical item to the sequential set, while it is more reasonable to make the entire set sequential at the PHON level. In other words, adopting the PHON theory necessitates separating these two tasks onto different planes. However, it remains unclear whether this separation effectively contributes to the efficient inventory in UG, especially from the perspective of the third-factor principle.

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NOTES

- 1 To be precise, 'MERGE' spelled in capital letters are introduced in Chomsky (2019a) together with the elaboration of the concept of Workspace (WS). While 'Merge' is simply defined as the simplest operation takes a pair of SOs (X, Y) into a set {X, Y} (Chomsky (1995), *et seq.*), MERGE targets WS which includes everything that makes up a sentence (WS=[X, Y, Z]) as well as the SOs (X, Y, Z). For example, MERGE (WS, X, Y) generates WS' where X and Y forms a set (WS'=[{X, Y}, Z]).
- 2 According to Cinque (2008, 2020), English NRC is categorized as a *non-integrated* NRC that shows a stark discontinuity from its host clause, which includes its antecedent. On the other hand, Italian has both *non-integrated* (*il quale* 'which/who' NRC) and *integrated* NRC (*che/qui* 'that' NRC), the latter of which exhibits a certain degree of continuity with its host clause, parallel to RRC. Whenever I mention NRCs in what follows, I assume them to be the non-integrated type unless otherwise noted.
- 3 See Schneider (2015: 278-282) and the references therein for the definition from a comprehensive perspective of practical language use.
- 4 A bundle of research on the relevant discontinuity of NRCs has been provided with intriguing proposals for capturing it. For example, prior to minimalism, two conflicting approaches had been entertained: the Main Clause Approach (e.g., Ross (1967), Emonds (1979), and McCawley (1981)), where an independent clause undergoes relativization as result of transformation; and the Adjunction Approach (e.g., Jackendoff (1977), Demirdache (1991), and Citko (2008)), in which a relative CP merges with its antecedent via adjunction. On the other hand, analyses by Kayne (1994) and Bianchi (1999) were proposed during the development of Kayne's antisymmetry theory. Such Antisymmetry Approaches assume NRC CPs to move out of the scope of relative determiner at LF. Furthermore, Vries (2006) entertains the Coordinate Structure Approach, in which an antecedent XP and NRC form a coordinate structure in terms of semantic specifying coordination. Later, Vries (2012) and Gobbo (2017) proposed the involvement of a functional head, through which the anti-c-commanding effect of NRCs is meant to be explained. Within the recent theoretical framework, Hayashi (2018) develops the counter-cyclic Pair-MERGE approach with a concise yet thorough review of major approaches to NRCs.
- 5 Dubinsky (2006: 6) raises intriguing contrasts in (i-ii),

which exhibit the same pattern as (10a-b).

- (i) Susan didn't/*did sketch the building after sneaking any glances at it. (restrictive modification)
 - (ii) Susan didn't sketch the building, only sneaking (*any) glances at it. (appositive modification)
- 6 It is interesting to note that *one*-substitution in the Italian counterpart of (15b) is also possible in both RRCs and integrated NRCs, as evidenced by the fact that integrated *che* NRCs can be a part of the pro-form *uno*.
- (i) Tom ha un violino, che era un tempo appartenuto a Heifetz, e T. has a violin that was a time belonged to H. and anche Jane ne ha *uno*.
also J. it has one
'Tom has a violin which once belonged to Heifetz, and Jane has one too.'
- (*uno* = un violino, che era un tempo appartenuto a Heifetz).
- I thank Guglielmo Cinque for bringing this fact to my notice.
- 7 I thank Norimasa Hayashi for his helpful comment on the indispensable compositional and countercyclic nature of FSQ. As argued in what follows, my alternative proposal departs from this idea because the hierarchical nature demonstrated in (ia-b) does not cover the unstructured facts intensively discussed in Section 2.
- 8 I thank an anonymous reviewer for his comment on the ambiguity that the earlier version of this part showed. Chomsky further argues that the list reading available from the relevant agreement relations is not directly related to syntax as also seen in McCawley (1968), namely not the part of I-language.
- 9 See Chomsky (2021a) and Goto and Ishii (2021: 9, fn. 3) for further discussion.
- 10 A plausible possibility when pursuing this direction might be to posit for LA to detect the shared morphophonological feature like ϕ among conjuncts that is invariably endorsed by the Law of Coordination of Likes of Williams (1981: 646). We still require the stipulation that the conjunctive head & is invisible for LA, however. See (i):
- (i) $\{ \langle \phi, \phi \rangle, \&, XP_{[\phi]}, YP_{[\phi]} \}$
- Although this may be beneficial for retaining Chomsky's (2013, 2015) view that labeling feeds interpretation at *both* of the interfaces, it is still unclear what kind of semantic interpretation the SO with the label $\langle \phi, \phi \rangle$ feeds to the SEM as indicated by Tonoike (2019: 374-375) and Takita (2020: 81).
- 11 On the other hand, in Chomsky (2013) he defended another approach in which the derivation of coordinate structures starts from $\{XP, YP\}$ configuration, then after

EM of Conj head, which is invisible to LA, one of the coordinates undergoes IM to its Spec yielding $\{XP, \{Conj, [\&XP, YP]\}\}$. However, this approach still needs to stipulate an extra device to rule out extraction either conjunct from the set. If our proposal is on the right track, there is nothing but two modes of structure building: MERGE or FST. Whichever case is selected by Σ in response to a request from SEM, the set gets eventually becomes sequential by the insertion of the conjunctive operator &, correctly predicting the island property.

- 12 In addition to note 10, I here take a modest position on the role of syntactic labels in NS. Labels have something to do with further computation in NS (cf. Chomsky (2008)) as well as the legibility at the Interfaces.
- 13 We have to stipulate that the conjunctive operator & is excluded from the identity checking at SEM. I thank one of the anonymous reviewers for drawing my attention to this point.
- 14 Alternatively, instead of advocating the inability of the set formed by FST to be labeled, we can derive the same outcome by arguing for the possibility of ambiguous labeling thoroughly considered by Mizuguchi (2019). That is, the relevant set is assigned an ambiguous label $\{ \langle K, CP, CP \rangle$ without any contradiction to the resulting SEM interpretation caused. In that case, however, some stipulation is necessary for K to be invisible for labeling.
- 15 As noted by an anonymous reviewer, the assumption that parentheticals, as exemplified in (4-7), are CPs may require further substantiation. In addition to the capability of hosting sentential adverbs, a point also made by Döring (2015), the potential for illocutionary independence from its anchoring clause—manifested as a different mood—may serve as a valid diagnosis. Regarding (5), it is observed that NRCs can exhibit illocutionally independence of their anchoring clauses, as demonstrated by (3a-c) in the body of the text.
- 16 I thank Josh Bowers for the grammaticality judgement of English counterpart of (37) which Döring (2015) provides German data in original.
- 17 Giorgi (2011: 6) says that higher K takes a 'structural term' parenthetical as its complement. However, that seems inconsistent with (38). I thank an anonymous reviewer for drawing my attention to this.
- 18 One of the anonymous reviewers suggests me to provide the order-restricted nature of parentheticals to solidify my proposal. I admit it is difficult to say that list readings attested in (27) are available for cases of parentheticals. However, in addition to (40b), there are a number of examples where dependencies are formed by linear

closeness. See also the examples of (60a-b) in the body.

- 19 I thank Hiroki Egashira for drawing my attention to this paradigm.
- 20 Irrelevant structural descriptions will be omitted unless otherwise noted.
- 21 I assume FSQ to be a SEM-oriented operation which takes place at NS before the SO is sent to SEM/PHON. As suggested in Goto and Ishii (2011), each term in the set $\{a, b, c\}$ formed by FST might c-command each other before Sequencing is applied. However, Σ will not receive any information about the c-commanding if the derivation proceeds in a strict Markovian manner. I suppose that FSQ is different from FormCopy in that the former does not leave a record in the ongoing derivation. Thus, it follows that the c-command fact is inaccessible to SEM when retrieving the relevant pronominal binding and NPI licensing.
- 22 MY is a required guiding 3rd factor principle to accommodate the linguistic recursion instantiated by MERGE. Suppose that MERGE ($X, Y, WS (= [X, Y, Z])$) takes place violating MY with individual X and Y still visible for further structure building, which eventually yields (i):
- (i) * $WS' = [[X, Y], X, Y, Z]$ (the number of accessible terms from 3 to 6)
- According to Ike-uchi (2022: 64), (i) can be regarded as a result of canonical recursive operation adopted in, for example, proof of a theorem. However, this does not apply to the case of MERGE because there would be an indeterminacy problem imposed on further application of MERGE.
- 23 If MERGE is the simplest enough to take a pair of SOs into a set as defined in Strong Minimalist Thesis, then the operation Copy, which had been understood to be an inherent result of IM, should be separated from it, which leads to the elaboration of the concept of FormCopy (e.g., Chomsky (2021b)). Like other computational tools other than MERGE, FormCopy applies in a phasal manner. This represents a significant departure from the traditional concept of Copy, introducing a bifurcation that identifies IM Configuration ($\langle X, Y, \dots \rangle$), as copies of an identical SO: (i) IM Copy; and (ii) M(arkovian)-Gap (a.k.a. IM Gap prior to Chomsky (2021b)). In summary, while (i) nearly maintains the traditional concept of copy formation via IM, (ii) permits two SOs that are assigned distinct different θ -roles to be recognized as copies of a single SO, as exemplified by PRO and its controller. For a detailed discussion, See Chomsky (2021b: 21-30).
- 24 See Kitahara (2021) for a comprehensive review of how

extensional variants of MERGE are ruled out that result from an illicit increase of accessibility of terms in WS.

- 25 Another possibility can be raised if we adopt IM instead of the FSQ approach at issue. Omune (2019), Goto and Ishii (2021), and Takahashi (2023) attempt to derive adjunction that was conventionally formed by Pair-MERGE from antisymmetry of terms notated as $\{X, \{X, Y\}\}$. Omune's strategy, which Takahashi adopts for a case of relative clause adjunction, entertains Immediate-Local MERGE, whereby IM of the term X immediately local to $\{X, Y\}$ is possible, giving $\{X, \{X, Y\}\}$. The term X has two occurrences, the lower of which is invisible to further computation due to Minimal Search (MS). Consequently, the term Y also becomes invisible because of the sister relation to the lower occurrence, deriving the adjunction nature of Y. Given this, let us suppose that anchored parentheticals like *George, his best friend* in (11a-c) eventually form a DP sequential unit in a way different from that argued elsewhere in the body. I can conceive the following derivational story:
- (i) $WS = [\{George, his\ best\ friend\}, \dots]$ (\rightarrow IM of *his best friend* takes place.)
- (ii) $WS' = [\{his\ best\ friend_2, \{George, his\ best\ friend_1\}, \dots]$ (\rightarrow Derivation proceeds to the stage just before topicalization applies.)
- (iii) $WS'' = [\{C, \{Peter, \{INFL, \{v^*, \{met, \{his\ best\ friend_2, \{George, his\ best\ friend_1\}\}, \{in\ primary\ school\}\}\}\}\}\}]$ (\rightarrow IM of *George* to SpecCP)
- (iv) * $WS''' = [\{George_2, \{C, \{Peter, \{INFL, \{v^*, \{met, \{his\ best\ friend_2, \{George_1, his\ best\ friend_1\}\}, \{in\ primary\ school\}\}\}\}\}\}]$
- In (iv), the IM of *George* for topicalization is barred because of the violation of MS. I am still unsure that the starting assumption that anchored parentheticals is eventually structured as DP sequences is tenable, so I leave this issue for future research.
- 26 An anonymous reviewer pointed out that wh_2 and wh_4 carry different θ -roles, which seems to be at odds with the canonical view for recognizing copies. As already mentioned in note 23, the concept of IM Gap has been reformulated as M-Gap, paving the way for incorporating Hornstein's (2001) insight on control under FormCopy. This new approach allows for inscriptions with different θ -roles to be considered copies. While further detail is needed, I believe this will lead to numerous beneficial outcomes, including the formation of copies between an external relative head and its internal inscriptions in RRCs. Consequently, the application of FormCopy might eliminate the need for such mechanisms as the null

operator and Sideward Movement (e.g., Hornstein (2001), Henderson (2007)) in relativization strategies.

- 27 An anonymous reviewer has raised the issue that applying the FSQ reasoning to (21b) would unexpectedly rule out instances such as (i) and (ii), which contradicts empirical observations:

- (i) I think John, my best friend, will be elected.
 (ii) I think John, and me too, will be elected.

In defending my position, I must acknowledge, though not satisfactory, that the parentheticals in (i) and (ii) do not represent typical examples of Giorgi's FID, and the same reasoning must be held for the contrast between (20b) and (21b). Accordingly, they possibly require a different derivational analysis. This matter will be left for future research.

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