

On the Coordination of Unlikes*

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Abstract

This paper defends the law of coordination of likes (LCL) proposed by Williams (1981). Focusing on what Grosu (1985, 1987) calls heterofunctional coordinate construction (HCC), in which verb-internal phrases of different functions and categories seem to be coordinated while sharing a verb, we propose that this construction is reduced to a standard case of coordinated verb phrases; that is, it obeys the LCL. We extend our analysis of HCC to cases of gapping and stripping, for which coordinate structure is also mandatory.

Keywords: law of coordination of likes, heterofunctional coordinate construction, VP-ellipsis, syntactic and semantic identity, argument alternation, gapping, stripping

1. Introduction

The coordinates of the coordination structure are generally similar in form and function; this is called the law of coordination of likes (LCL) (see Williams (1981)). Thus, if different expressions in form and/or function are involved in coordination, as in (1a), the sentence containing such a coordination is unacceptable.

(1) a. *John eats pork and at home.

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- b. John eats only pork and only at home.

(Grosu (1985: 231-232))

However, there are exceptions to LCL, as shown in (1b), which is minimally different from (1a) in that a focus adverb *only* is added to both conjuncts. We refer to this latter type of example as a heterofunctional coordinate construction (HCC) following Grosu (1985, 1987).¹

In this paper, we argue that the two cases of coordination that seemingly have the same coordinates in (1) are differently structured and, particularly, that the case involving focused coordinates, i.e. the HCC in (1b), can be better analyzed as composed of the coordination of verb phrases. In this sense, we defend the position that LCL is a robust condition. Furthermore, we compare HCC with similar constructions, such as gapping and stripping, and suggest a unified VP-coordination account of them.

2. Three Characteristics of HCC

In the introduction, we showed that one of the defining properties that make HCC acceptable is the addition of a focus adverb to both conjuncts. This section will outline three more characteristics of HCC.

First, the overt verb behaves as if it is understood to appear in distinct subcategorization frames with respect to the two conjuncts. For example, the verb *eat* exhibits the unspecified object alternation and thus has two variants: the transitive variant (e.g. (2a)) and the intransitive variant (e.g. (2b)) (Levin (1993)).

- (2) a. John eats only pork.
 b. John eats only at home.
 c. John eats only pork and only at home.

(Grosu (1985: 232))

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Despite the absence of an overt direct object in the intransitive variant, the verb is understood to have an indefinite object that can be paraphrased as something edible. In (2c), then, the direct object *only pork* of the transitive variant is coordinated with the verbal adjunct *only at home* modifying the intransitive variant. Thus, the single verb in (2c) simultaneously forms two selectional relations with respect to the two conjuncts.

Second, as pointed out in Grosu (1985, 1987) and Whitman (2004), the construction denotes not one but two events. Thus, the sentence can be improved by adding adverbs such as *today* and *yesterday* to clarify that two events are involved, as illustrated in (3).

- (3) John ate only pork yesterday and only at home today.

Our informant reports the same judgment and interprets sentence (3) as referring to two events: John ate only pork yesterday, and he ate something edible only at home today.

The third characteristic is concerned with the order of the coordination. As shown in (4), the order of the conjuncts can be reversed (Whitman (2004)).

- (4) a. John ate only pork yesterday and only at home today.
 b. John ate only at home today and only pork yesterday.

According to our informant, (4a), where the first conjunct is the object of the transitive *eat* and the second conjunct is the verbal adjunct of the intransitive *eat*, is deemed acceptable. Similarly, (4b), where the order of the conjuncts of (4a) is reversed, is deemed acceptable.

Although we showed that the order of the conjuncts is irrelevant in the example of *eat*, there are some verbs for which this property does not hold when

they occur in HCC. For example, first consider the verb *worry*, which exhibits the causative–inchoative alternation, as in (5).

- (5) a. The student worries about his grades.
 Experiencer Subject-Matter
 b. The student worries his teacher.
 Causer Experiencer

In (5a), the verb has an intransitive variant, where *the student* is interpreted as an experiencer and *his grades* as a subject matter of emotion. In addition, the verb has a causative variant in (5b), where *the student* is interpreted as a causer and *his teacher* as an experiencer (see Pesetsky (1996)). We use these two variants to create a coordination structure in which the subject-matter internal argument of the (5a) type and the experiencer internal argument of the (5b) type are coordinated.² Unlike the case of the verb *eat*, our informant judged (6a) and (6b) to be sharply contrasted in acceptability.

- (6) a. The student worries only his teacher before exams and only about
 his grades after the semester is over.
 b. *The student worries only about his grade after the semester is over
 and only his teacher before exams.

When the object NP of the transitive *worry* is coordinated with the *about* phrase of the intransitive *worry* in this order, as in (6a), the sentence is allowed. When the order of the conjuncts is reversed, as in (6b), the sentence is degraded.³

In this section, we have outlined three characteristics revealed in the literature: (i) a single verb forms different selectional relations to the conjuncts in HCC; in this connection, (ii) HCC encodes not a single event but multiple events;

and (iii) the order of the conjuncts is sometimes irrelevant but sometimes crucial depending on the type of alternation that the single verb participates in.

3. Proposed Analysis

In this section, we propose a VP ellipsis analysis for the HCCs discussed above. Subsequently, we demonstrate that our analysis has additional plausibility by comparing it with Grosu's (1985) condition on HCC.

3.1. VP Ellipsis Analysis

First, we discard the idea that different syntactic categories are coordinated in HCCs. Instead, we analyze HCCs as conjoining two verb phrases. The verb phrase in the second conjunct undergoes deletion, stranding the focused element.

The VP conjunction analysis demonstrates that HCC is no longer an exception to the LCL. HCC comprises the coordination of phrases of the same syntactic category. The VP conjunction analysis can account for the fact that the single overt verb, for example, *eat* looks like it was used transitively and intransitively at the same time over the two conjuncts. If two verb phrases are independently projected, their heads may differ in valency. Furthermore, the fact pointed out in Grosu (1985, 1987) and Whitman (2004), i.e., that HCC denotes two events, is also directly captured under our analysis, by positing that each of the two coordinated verb phrase introduce the event argument (see Parsons (1990)).

Another primary motivation for the VP ellipsis analysis is the similarities between the constraints on the order of two verb phrases in the HCC and those in the VP ellipsis. Nakamura and Sugimoto (2015: 70-71) observed that when the causative variant of *worry* is used in the antecedent verb phrase, the ellipsis of the intransitive verb phrase is allowed, as in (7a). In contrast, the reverse pattern in (7b), where the intransitive verb phrase is the antecedent and the causative phrase

is elided, is not allowed.

- (7) a. Susan said that Mary's poor health_i would worry John_j and he_j did
<worry about it_i>.
- b. *Susan believed that John_i worried about Mary's poor health_j, but it_j
did not <worry him_i>.

Nakamura and Sugimoto (2015: 70-71) argue that the fact in (7) can be accounted for by assuming that the causative verb structure subsumes the intransitive verb structure with the causative projection layering above the intransitive structure (see the discussion around (8) below). Because syntactic and semantic identity conditions are imposed on VP ellipsis (Merchant (2001, 2013)), we predict that the ellipsis of the intransitive verb phrase in (7a) is possible: the antecedent causative structure contains the structure identical to the elided intransitive verb phrase; thus, the syntactic identity condition is satisfied. In contrast, the causative verb phrase cannot be deleted in (7b): the antecedent intransitive structure does not contain the causative layer contained in the elided causative verb phrase, violating the syntactic identity requirement.

For these reasons, we extend the VP ellipsis analysis of the contrast in (7) to that in (6), as well as the absence of the contrast in (4). In doing so, we assume the following verb phrase structures for the *worry* type of psychological verb (e.g. Alexiadou, Anagnostopoulou and Schäfer (2015) and Nakamura and Sugimoto (2015)).

- (8) a. [_{VP} DP1 V_{experiencer} [_{VP} aboutP V_{subject matter} [_{VP} √worry]]]](=(5a))
- b. [VoiceP DP1 Voice [_{VP} DP2 V_{experiencer} [_{VP} ∅ V_{subject matter} [_{VP} √worry]]]]](=(5b))

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The intransitive alternant of *worry* has the underlying structure (8a), where the functional $v_{\text{subject matter}}$ head introduces a subject-matter argument as its spec and the functional $v_{\text{experiencer}}$ head, an experiencer argument. The causative alternant has the structure (8b), where the vP in (8a) is embedded under the Voice head that provides a causer or agent argument. Thus, its presence or absence is involved in the causative–inchoative alternation.

For the verb *eat*, which participates in the unspecified object alternation, we suppose that it has the following verb phrase structures:

- (9) a. [_{VoiceP} DP1 Voice [_{vP} \emptyset v_{theme} [_{vP} $\sqrt{\text{eat}}$]]]
 b. [_{VoiceP} DP1 Voice [_{vP} DP2 v_{theme} [_{vP} $\sqrt{\text{eat}}$]]]

The intransitive and transitive variants of *eat* have the structures (9a) and (9b), respectively. In these structures, the functional v_{theme} head layers above the lexical root and introduces a theme argument. The voice head merges with the vP and introduces an external agent argument. Notably, the subject matter in (8b) and the theme in (9a) are realized as null arguments \emptyset and are interpreted as indefinite expressions such as something edible in (9a).⁴

A further assumption is that temporal adjuncts such as *today*, as well as locational adjuncts such as *at home*, are right-adjoined to the top of the extended projection of VP, namely, VoiceP or vP (e.g. Imanishi and Asano (1990: 318-327), Larson (2010: 259-267)). This assumption is confirmed by the data involving VP-fronting presented in (10).

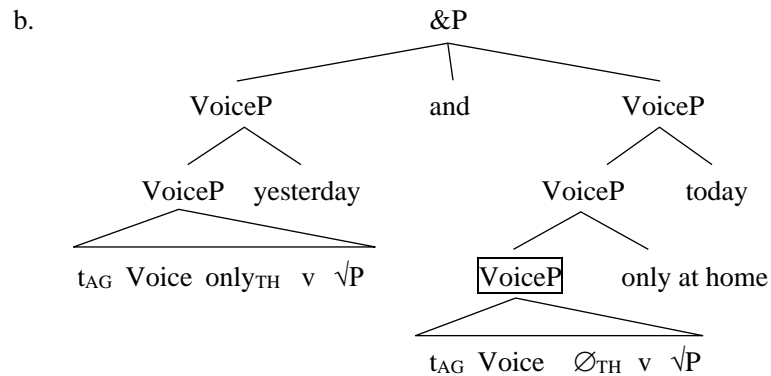
- (10) a. (Homer said he would eat pork today and) Eat pork today, he did.
 b. (Homer said he would eat pork before the meeting and) Eat pork before the meeting, he did.

- c. ?(Homer said he would eat pork when he went home and) Eat
pork when he went home, he did.

The data in (10) show that temporal adverbials can be preposed with the verb phrase. This finding is consistent with the idea that such adverbials can be adjoined to the top of the extended projection of VP.

With these assumptions in mind, we will demonstrate how HCCs are derived under the VP ellipsis analysis and how the different syntactic behaviors exhibited by the verb *eat* and the verb *worry* can be accounted for. We first consider the example in (11a). The verb phrases in question have the structures in (11b), where the VoiceP of the transitive *eat* and the VoiceP of the intransitive *eat* are conjoined in this order, and the deleted part of the latter projection is marked with a box notation.

- (11) a. John ate only pork yesterday and only at home today.



As mentioned above, we assume that both semantic and syntactic identity conditions are imposed on the VP ellipsis. For the semantic identity condition, Merchant (2001) uses the focus condition in (12), which is based on the notion of e-GIVEN defined in (13), which then builds on F-closure in (14).

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- (12) Focus condition on VP-ellipsis
 A VP α can be deleted only if α is e-given.
 (Merchant (2001: 26))
- (13) e-GIVENNESS
 An expression E counts as e-given iff E has a salient antecedent A
 and, modulo \exists -type shifting,
 (i) A entails F-clo(E), and
 (ii) E entails F-clo(A).
 (ibid.)
- (14) F-closure
 The F-closure of α , written F-clo(α), is the result of replacing
 F-marked parts of α with \exists -bound variable of the appropriate type
 (modulo \exists -type shifting). (ibid.: 14)

Next, we illustrate how the condition is applied to the case of (11). The antecedent in (11) is the lower VoiceP in the first conjunct [_{VoiceP} ate only pork]. This VoiceP has a subject trace left behind by the across-the-board movement of the external argument. We assume that traces undergoes \exists -type shifting. In this case, its application to the VoiceP yields (15).

- (15) VoiceP_A = $\exists x$. x ate only pork

Next, we consider the denotation of the deletion site, namely, the lowest VoiceP in the second conjunct [_{VoiceP} ate \emptyset]. This VoiceP also has an open variable left in the subject position by the ATB movement. Thus, it undergoes \exists -type shifting. As mentioned earlier, because the null argument \emptyset in the elided part is interpreted as something (edible), it can be regarded as existentially closed (see Merchant

(2001)). Because the elided VoiceP does not contain any F-marked expression, the Focus closure of the VoiceP trivially yields (16).

$$(16) \quad \text{F-clo}(\text{VoiceP}_E) = \exists x. \exists y. x \text{ ate } y$$

Because (16) holds whenever (15) holds, the latter entails the former. Then, we examine whether E entails F-clo(A). The F-closure is applied to the antecedent such that the focus element *only pork* is replaced with an \exists -bound variable, as illustrated in (17).

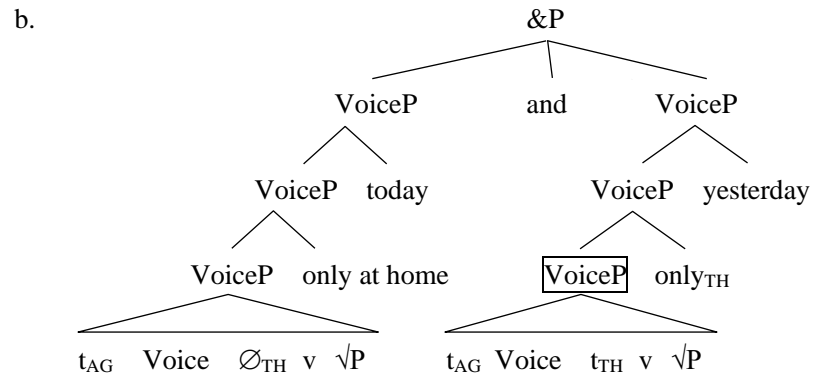
$$(17) \quad \text{F-clo}(\text{VoiceP}_A) = \exists x. \exists y. x \text{ ate } y$$

Because F-clo(VoiceP_A) is identical to the denotation of the elided VoiceP, which is identical to (16), the latter entails the former. Therefore, a desired two-way entailment relation holds between the antecedent and the elided part. In addition, because the transitive and intransitive counterparts of *eat* have an identical transitive structure and only differ in that an implicit argument occupies the theme position in the latter, the syntactic identity condition is also satisfied.⁵

Next, we consider (18), where the VoiceP of the intransitive *eat* is the first conjunct and that of the transitive *eat* is the second conjunct.

$$(18) \text{ a. } \text{John ate only at home today and only pork yesterday.}$$

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We first assume that in the second conjunct, the focused element *only pork* adjoins to VoiceP to survive deletion (Gengel (2013)).⁶ Assume with Merchant (2001) and Barros and Kotek (2019) among others that the trace of the focused element (such as *only pork*) is also replaced with an \exists -bound variable due to the F-closure or \exists -type shifting. Based on these assumptions, the antecedent and the elided part fulfill the semantic and syntactic identity conditions, such as those in (11), and the transitive verb phrase can be deleted.

Next, we examine the verb phrase structure of the verb *worry* in (19), where the VoiceP of the causative verb *worry* and the vP of the intransitive verb *worry* are conjoined in this order.

- (19) a. The student worries only his teacher before exams and only about his grades after the semester is over.

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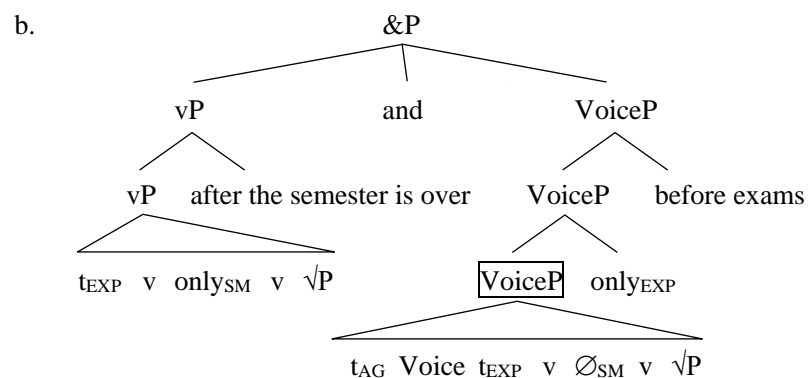
(21) $F\text{-clo}(vP_E) = \exists x. \exists y. x \text{ worries about } y$

As discussed previously, the open variable left in the subject position undergoes \exists -type shifting independently of F-closure in (21). Because (20) has a more specific meaning than that of $F\text{-clo}(vP_E)$, the former entails the latter. The next question is whether the elided vP entails the F-closure of the antecedent vP. The application of F-closure to the antecedent vP results in the denotation in (22).

(22) $F\text{-clo}(vP_A) = \exists x. \exists y. x \text{ worries about } y$

The elided vP has the same denotation as (21) and entails $F\text{-clo}(vP_A)$. Thus, the two-way entailment relation holds in this case. Furthermore, the antecedent vP contains a structure identical to the elided vP structure; thus, the syntactic identity requirement is also satisfied. Finally, we consider (23), where the order of the conjuncts is reversed.

(23) a. *The student worries only about his grade after the semester is over and only his teacher before exams.



In this case, what must be deleted is the lowest VoiceP in the second conjunct

[_{VoiceP} worries only his teacher about \emptyset]. As we have assumed, the subject trace and the null argument are interpreted as \exists -bound variables. Then, the focus closure of the VoiceP is given in (24), where the causative *worry* is paraphrased as “x cause y to worry about z” and the trace of the F-marked element is also existentially closed.

$$(24) \quad \text{F-clo}(\text{VoiceP}_E) = \exists x. \exists y. \exists z. x \text{ worries } y \text{ about } z$$

However, the antecedent does not contain the Voice layer that introduces causative semantics. Thus, the antecedent vP does not entail $\text{F-clo}(\text{VoiceP}_E)$. Because the vP is also syntactically non-isomorphic to the deleted VoiceP, syntactic and semantic identities do not hold between the two verbal projections. Regarding this connection, we consider the case in which the example in (25) does not undergo ellipsis. In such a case, the two-way entailment relation does not have to hold; thus, the resulting sentence should be acceptable. This predication is borne out in (25). Thus, this fact corroborates our argument that ellipsis is involved in the example in (23).

- (25) The student worries only about his grade after the semester is over
and worries only his teacher before exams.

3.2. Argument Alternation Patterns Available in the HCC

We have shown that the contrastive behavior between the verbs *eat* and *worry* in the HCC can be accounted for in terms of VP ellipsis conditioned by syntactic and semantic identity. In this section, we provide additional support for our argument by showing that Grosu’s (1985) condition on the HCC is incorrect.

Grosu (1985) argued that HCC is subject to the condition that “phrases

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occurring in ‘parallel positions’ must be omissible with preservation of grammaticality and sense.” To illustrate the condition, we first consider (26).

- (26) a. John eats only pork.
 b. John eats only at home.

The two entries of the verb *eat* in (26a, b) have almost the same meaning; that is, they differ only in whether their theme argument in the direct object position is realized as an overt element in (26a) or as a null argument in (26b). In this sense, the direct object in (26a) is omissible without being degraded or changing its core meaning. Moreover, the locative adjunct, also omissible, looks as if it was coordinated with the overt direct object in the HCC in (27).

- (27) a. John ate only pork yesterday and only at home today.
 b. John ate only at home today and only pork yesterday.

In other words, the direct object and the locative adjunct are in parallel positions and omissible. Thus, the two verbal entries satisfy Grosu’s condition, and the single verb is permitted to occur in two subcategorization frames in the two conjuncts.

In contrast, Grosu’s condition is not satisfied by the two entries of the verb that exhibit the causative–inchoative alternation. Grosu (1985) demonstrated that causative and inchoative entries of the verb *move*, for example, differ in that the theme argument of a verb such as *move* serves as a subject in the inchoative variant but an object in the causative variant. In other words, the direct object of the causative entry cannot be omitted without being degraded. Thus, such entries do not fulfill the condition; thus, the two variants of the verb are not allowed to participate in the HCC, as shown in (28).

- (28) *Hurricanes move only at great speeds and only large amounts of air.
(Grosu (1985: 234))

However, as shown in (29), the order of the conjuncts is crucial for the acceptability of the HCC. Notably, the same holds true for the verb *worry* discussed in section 3.1.

- (29) Hurricanes moved only large amounts of air yesterday and only at great speeds today.

To justify his condition, Grosu used the unacceptable data (28), wherein the verb *move* functions as the inchoative variant for the first conjunct and as the causative variant for the second. However, Grosu's argument is incorrect because of the existence of acceptable data in (29), which has a reverse order of the conjuncts. Our informant also deems the data (28) to be unacceptable but judges that the reversed pattern of the conjuncts in (29) is acceptable. Grosu's (1985) condition incorrectly predicts that these data are unacceptable.

In summary, the HCC data involving the verbs participating in the causative–inchoative alternation suggest that his acceptability condition on the HCC is incorrect and must be reconsidered. In contrast, as shown above, our VP ellipsis analysis explains the facts with recourse to general identity conditions on ellipsis (Sugimoto (2018)). Therefore, our VP ellipsis analysis surpasses Grosu's (1985) condition in explaining the acceptability of HCC.

4. Consequences

4.1. Gapping

When we discussed the licensing condition on HCC in the previous section, we referred to Grosu's (1985) condition that “phrases occurring in ‘parallel

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positions' must be omissible with preservation of grammaticality and sense." Grosu (1985) argued that gapping, also restricted to coordination contexts, obeys the same condition, as shown in (30) (see also Johnson (2019) for an overview of gapping).

- (30) a. John eats only pork, and Mary, only at home.
 b. John eats only at home, and Mary, only pork.

The phrases *only pork* and *only at home* are in parallel positions in the first and second conjuncts, respectively. When the first conjunct sentence is isolated as a single clause, the phrase *only pork* or *only at home* can be omitted without degrading the acceptability of the whole sentence or changing its core meaning. Thus, the examples in (30) are acceptable even when the two phrases function differently. When gapping violates the condition, the resulting sentence is unacceptable, as in (31), where a mismatch for the causative–inchoative alternation occurs between the first and second conjuncts.

- (31) This window can open at any moment, and John *(can open) any
 door. (Grosu (1985: 234))

In (31), the phrases *at any moment* and *any door* are in parallel positions. However, because *any door* in the second conjunct cannot be omitted when used in the full-fledged form, the sentence in (31) is unacceptable.

Grosu (1985) only discussed cases in which the inchoative variant is used in the antecedent sentence and the causative variant in the gapped sentence. Although our informant also deems the pattern unacceptable, the informant reports that when the order of the variants is reversed, such a mismatch sounds acceptable

in gapping, as in the case of the causative–inchoative alternation verb *worry* and *move* in HCC. We consider the examples in (32) and (33).⁷

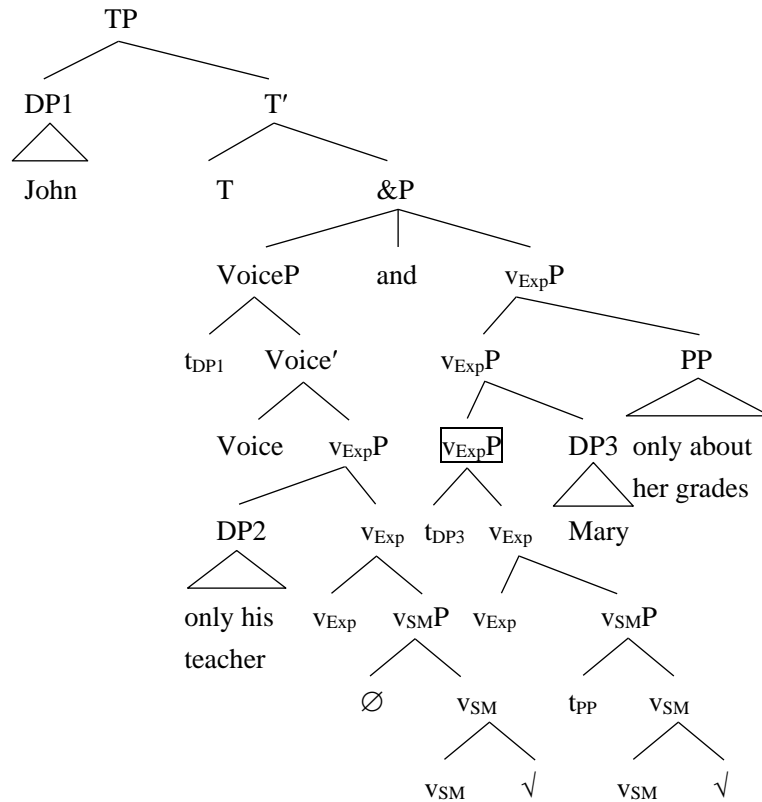
- (32) a. Large hurricanes move only large amounts of air, and small hurricanes, only at great speeds.
 b. *Small hurricanes move only at great speeds, and large hurricanes, only large amounts of air.
- (33) a. John worries only his teacher, and Mary, only about her grades.
 b. *John worries only about his grades, and Mary, only her teacher.

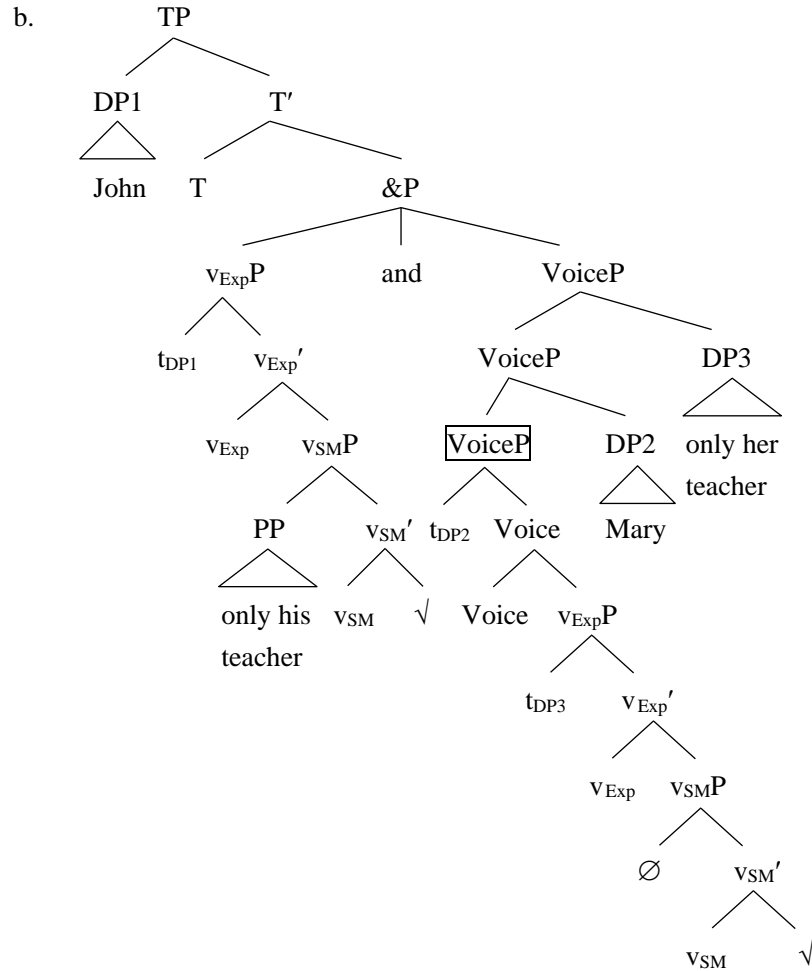
In (32), the verb *move* is used. If the intransitive variant is contained in the antecedent sentence and the causative variant is gapped, the resulting sentence is unacceptable. In contrast, the intransitive variant can be gapped when the causative variant is used in the antecedent sentence. The same is true in the examples in (33), where the verb *worry* is used.

In this manner, HCC and gapping seem to obey the same condition. A straightforward way to account for this fact is to offer a unified analysis of HCC and gapping via the move-and-delete analysis of gapping (see Johnson (2019) for an overview). Johnson (2019) discusses two ways to derive gapping under low coordination, namely, the coordination of verbal projections, in one of which remnants in gapping are moved out of the projection to be deleted. Under this move-and-delete analysis, the examples of gapping in (33) are analyzed, as shown in (34), where the structure is provided using the terms and manners used in this paper; deleted phrases are marked with a box.⁸

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(34) a.





In (34a), which corresponds to the structure of (33a), we assume that gapping applies to the lowest segment of $v_{Exp}P$ in the second conjunct out of which the experiencer phrase and the subject-matter phrase are evacuated. In this case, gapping is ruled in because the gapped $v_{Exp}P$ is considered syntactically identical to the antecedent $v_{Exp}P$ properly contained within VoiceP. They are also understood to be semantically identical because the correlate corresponding to the DP remnant, *only his teacher*, is focused, and an implicit subject-matter argument

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\emptyset is projected in the first conjunct, with both being existentially closed in the relevant stage of the calculation of semantic identity (see section 3 for the calculation of semantic identity). Conversely, in (34b), which corresponds to the structure of (33b), gapping applies to the lowest segment of VoiceP in the second conjunct out of which the remnants move. In this case, the appropriate VoiceP antecedent cannot be found in the first conjunct; notably, no VoiceP is involved. Thus, gapping is disallowed in (33b).

In this manner, the contrasts observed in (32) and (33) are captured under our move-and-delete analysis in the same way as HCC is.

4.2. Stripping

The external syntax of stripping is also similar to HCC, as shown in the example of stripping in (35) (see Johnson (2019) for an overview of stripping).

(35) Jones likes seafood a lot, and bread too. (Johnson (2019: 562))

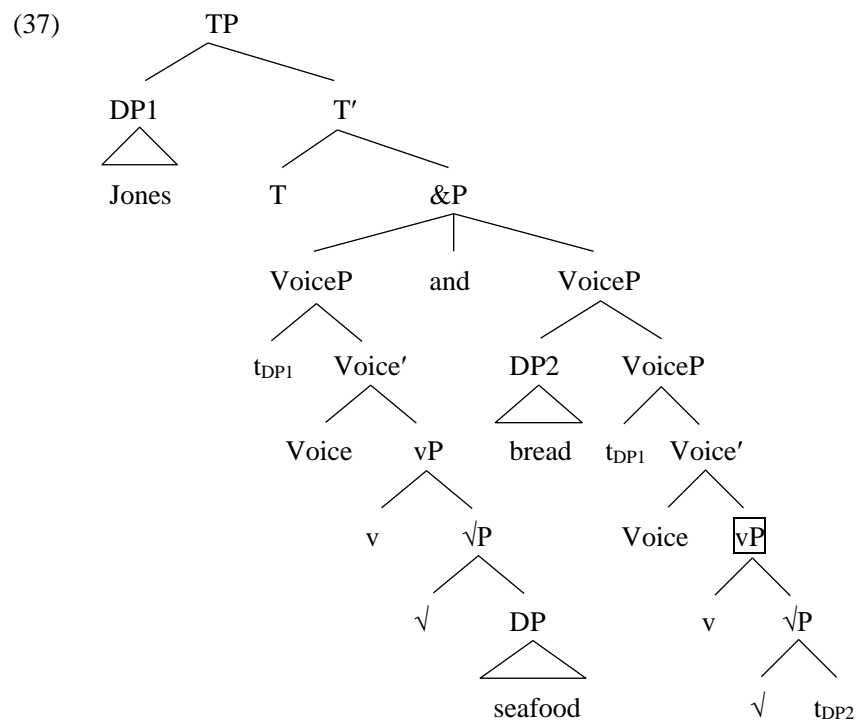
The second conjunct of the example in (35) is interpreted as having a subject and a verb identical to those in the first conjunct. Stripping is also typically restricted to coordination contexts. Thus, if stripping occurs in the subordination context, as shown in (36), the resulting sentence is unacceptable.

(36) *Jones likes seafood because bread too.

Johnson (2019) puts forward a move-and-delete analysis of stripping. In the analysis, the example in (35) is analyzed as shown in (37), where the structure is provided using the terms and manners in this paper.

In (37), VoicePs, not TP, are coordinated, and vP in the second conjunct, marked with a box, is deleted. In the second conjunct, the remnant of stripping

undergoes focus movement overtly and moves out of the ν P before it is deleted.⁹ Because the corresponding element in the first conjunct, namely, *seafood*, is also focused, the ν P in the first conjunct semantically functions as an appropriate antecedent to the deleted ν P in the second conjunct.



In this manner, our proposal offers a unified account of HCC, gapping, and stripping using the move-and-delete analysis with low coordination.¹⁰

5. Conclusion

In this paper, we propose that what appears to be a coordination of verb-internal phrases of different functions and categories should be analyzed as a coordination of verb phrases, with the second conjunct being derived by VP

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ellipsis. Thus, this study affirms that Williams' (1981) LCL is a robust condition. We suggest that our analysis can be extended to gapping and stripping, which also involve coordination. In this manner, our findings contribute to the simplification of the general analysis of coordination and related phenomena involving coordination.

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Notes

1) Similarly, Bruening and Al Khalaf (2020) argued against the coordination of unlike categories by reanalyzing HCCs as involving conjunction reduction (see also Wilder (2019)). In addition to conjunction reduction, they proposed that two other mechanisms are involved in other category mismatches: super-categories and empty heads. See Patejuk and Przepiórkowski (2023) and Bruening (2023) for discussions on these mismatches.

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2) Note that our informant deems the data without the focus particle *only* to be unacceptable.

- (i) a. ??The student worries his teacher and about his grades.
- b. *The student worries about his grade and his teacher

Contrastively, as shown in (6a) and the following data (ii), the sentence can be improved by adding the focus particle *only* and temporal adverbials, which are characteristics of HCCs.

- (ii) The student worries only his teacher and only about his grades.

3) Professor Etsuro Shima (personal communication) points out a possibility that the order of the events specified by the temporal conjunctions like *after* and *before* is a crucial factor for the acceptability, rather than the order of transitive and intransitive verbs. However, this possibility is falsified by the following data.

- (i) a. The student worries only his teacher after the semester is over and only about his grades before exams.
- b. *The student worries only about his grade before exams and only his teacher after the semester is over.

(ia, b) are different from (6) only in that the orders of temporal adverbials are reversed. However, the acceptability of the sentences remain unchanged. This means that the order of the temporal adverbials is not a crucial factor for the acceptability of HCCs.

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4) Differently from our assumption about the implicit argument of the verb *eat*, Collins (2023) argued that it is not syntactically projected, by showing that it cannot be modified by the object-oriented secondary predicate.

(i) John ate *(it) raw. (Collins (2023: 66))

However, we leave for further research the question of why the implicit argument cannot be modified by the secondary predicate although it is syntactically projected under our analysis. We are grateful to Professor Etsuro Shima (personal communicatin) for bringing this idea to our attention.

5) We assume that the syntactic identity relation in VP-ellipsis must hold between verbal heads of the antecedent and elided verb phrases. More specifically, the elided verb phrase is constructed in the same way as the antecedet verb phrase up to the highest head in the former.

6) Regarding the word order of the focused argument and the temporal adjunct, we could assume that the focused argument is right-adjoined to VoiceP in a tucking-in fashion to derive a desired word order (Richards (1997, 2001)). However, these detailed discussions require further research.

7) We leave for further research the question of whether any other transitive-intransitive alternations also exhibit the same pattern.

8) The coordination of a causative verb phrase (VoiceP) and an inchoative one (vP) is generally permitted, as our informant judges that those which do not involve VP-ellipsis are acceptable.

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10) Our analysis predicts that stripping also exhibits causative-inchoative mismatches. However, our informant judges that such examples are unacceptable, as shown in (i) and (ii).

- (i) a. The student worries his teacher before exams, and the student worries about his grades before exams.
- b. *The student worries his teacher before exams, and about his grades, too.
- (ii) a. The student worries about his grades before exams, and the student worries his teacher before exams.
- b. *The student worries about his grades before exams, and his teacher, too.

As the contrasts show, those examples involving stripping, i.e. (ib) and (iib), are unacceptable. The unacceptability might be attributed to the focus particle *too* imposing a parallelism constraint over the two conjunct. Further investigation is a topic of future research. We would like to thank Etsuro Shima (personal communication) for bringing this issue into our attention.

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