

Verb Movement as Tense Operator Movement*

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Abstract

I propose a way of deriving verb movement in the Narrow Syntactic component. First, I propose that [T] in T introduces a variable, T_{Var} , whereas [Fin] in C introduces a tense operator, T_{Op} , which specifies the value of a tense variable as present, past, etc. Second, I propose, in analogous to the derivation of *wh*-subjects proposed by Chomsky (2008), i) that [T] raises v^* -V, the latter remerges to the root of TP, and the occurrences of the raised verb make a variable verb chain, on one hand, and ii) that [Fin] raises v^* -V, and the latter directly remerges to the root of CP and functions as the tense operator that ranges over the variable verb chain, on the other. I argue that the proposal here accounts for the exceptional status of verb movement. With the proposal here I provide accounts not only for traditional issues but also for the Head Movement Constraint (Travis 1984), movement of focused non-finite/finite verbs, and clitic climbing.

1. Introduction

A finite verb can appear in different positions among different languages. The finite verb *kisses* follows an adverb *always* in English (1a). The finite verb *embrasse* moves and precedes the adverb *toujours* in French (1b). The finite

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verb *kysser* moves not only across the adverb *alltid* but also across a subject *Jon* in Swedish (1c). These facts indicate that the finite verb is located in the v*P domain in English, in the TP domain in French, and in the CP domain in Swedish.

- (1) a. John (*kisses) always (^{OK}kisses) Mary. (Eng.)
- b. Jean (^{OK}embrasse) toujours (*embrasse) Marie. (Fre.)
 Jean kisses always kisses Marie
 ‘Jean always kisses Marie.’
- c. Marit (^{OK}kysser) Jon (*kysser) alltid (*kysser). (Swe.)
 Marit kisses Jon kisses always kisses
 ‘Marit, Jon always kisses her.’

Verb movement stands in an exceptional status among movement phenomena and has several problems on both theoretical and empirical sides, which I discuss in the next section.¹

In this paper I propose a way of deriving verb movement in Narrow Syntax. First, I propose i) that [T] in T introduces a variable, T_{Var} , whereas [Fin] in C introduces a tense operator, T_{Op} , which specifies the value of a tense variable as present, past, etc. Second, I propose, in analogous to the derivation of *wh*-subjects proposed by Chomsky (2008), i) that [T] raises v*-V, the latter remerges to the root of TP, and the occurrences of the raised verb make a variable verb chain, on one hand, and ii) that [Fin] raises v*-V, the latter directly remerges to the root of CP, and the raised verb functions as the tense operator that ranges over the variable verb chain, on the other. With this proposal I provide accounts not only traditional issues but also for the Head Movement

¹ For a traditional account of head movement in the GB theory, see Baker’s (1988) *Government Transparency Corollary*.

Constraint, movement of focused non-finite/finite verbs, and clitic climbing.

This paper is organized as follows. In section 2 I introduce and discuss the problems with verb movement. In section 3 I propose a way of deriving verb movement in the Narrow Syntactic component, and formulates verb movement as tense operator movement. In section 4 I provide accounts for the exceptional status of verb movement and the issues related to head movement in turn. In section 5 I briefly conclude this paper, suggesting that movement phenomena are classified into either operator movement, including verb movement and A'-bar movement, or non-operator movement represented by A-movement.

In this paper I assume that readers are familiar with the theoretical background on the phase-cartographic theory (Chomsky 2000, 2001, 2004, 2008, Rizzi 1997, Cinque 1999). Concerning the interface between syntax and morphophonology, I adopt Distributed Morphology (Halle and Marantz 1993) and assume that phonological feature assignment is done strictly in the phonological component PHON.

2. The problems with verb movement

Verb movement is said to be exceptional among movement phenomena. In much literature it is assumed that a verb is adjoined to the functional head(s) (2), whereas a phrase merges to the root (3).²

(2) a. Have you *have* been able to do it?

b. [_{CP} have+T+C [_{TP} ... have+T [_{VP} ... have ...]]]

² I omit the details other than the derivation of the relevant sentential elements.

(3) a. A SWEATER, I gave a sweater to John (, not a SHIRT).

b. [_{CP} a sweater C [_{TP} ... [_{v*P} ... a sweater ...]]]

Due to this property of adjunction, a raised verb does not c-command its copy. And verb movement is countercyclic: it does not extend a tree, and violates the Extension Condition (Chomsky 1995). Furthermore, on the assumption that the occurrences of a raised category produce a chain, the chain made by verb movement is not uniform. As illustrated in (4), one more feature is added to the next higher occurrence of a verb in turn. The occurrences in the verb chain are not identical to each other (cf. Chomsky 2001:38).

(4) a. [_{TP} ...embrace+v*+T ... [_{v*P} ... embrace+v* [_{VP} embrace ...]]] (=1b)

b. <embrace+v*+T, embrace+v*, embrace> (i.e. <V+v*+T, V+v*, V>)

There are several problems with verb movement. First, V-T movement partly correlates with the presence of rich morphological inflection, whereas V-C movement does not show such a correlation. A finite verb moves to T in, e.g. the Romance languages like French that have a comparatively rich inflectional system, whereas it does not move in languages like English that have only a poor inflectional system (Emonds 1978, Pollock 1989, Belletti 1990, Roberts 1993, Chomsky 1995). Most of the V2 languages (excluding German and Icelandic), on the other hand, do not have as rich an inflectional system as the Romance languages. The Mainland Scandinavian languages like Swedish,

for instance, have only one form for all persons in present and past tenses.

Second, no difference in meaning arises no matter in which position a verb appears: the interpretation of a verb does not differ among languages, whether the finite verb follows an adverb as in English (1a), moves across the adverb as in French (1b), or moves even across a subject as in Swedish (1c).³ This property is problematic in the current phase system. According to Chomsky (2001), syntactic movement occurs only when a semantic difference is reflected on the interface. The phrase *a sweater* in (3), for instance, moves to sentence-initial position to receive the focal interpretation that it could not receive in the original position. Hence, Chomsky (2001:37-38) claims that verb movement is an operation in PHON.

An argument against verb movement as a PHON operation comes from Scandinavian Object Shift (Holmberg 1986), in which a weak object pronoun (and also a full NP in Icelandic) can move across a sentential adverb like negation only when verb movement occurs (*Holmberg's Generalization* HG, Holmberg 1986): e.g. (Swe.) *jag kysste henne inte* (I kissed her not 'I didn't kiss her' VS *jag har inte sett den* (I have not seen it 'I haven't seen it'). Holmberg (1999) convincingly argues that objects can move only after VP is vacated (not only by verb movement but also by the movement of any other constituent(s) inside VP). This indicates that verb movement must precede the movement of

³ See, e.g. Truckenbrodt (2006), for an argument that verb movement yields a semantic effect. To argue that verb movement can change the meaning of a sentence is one thing; to provide an account for the difference in the surface positions of a verb between languages is another. Assume, following Truckenbrodt, that the feature [Epist(emology)], due to the presence of which the utterance by a speaker can be the common knowledge between the speaker and the addressee, is involved in v(*)-to-C movement in declarative sentences. We would have to say that the utterance by a speaker can be the common knowledge in the V2 languages, whereas the utterance cannot be the common knowledge in the Romance languages and languages like English. As long as the interpretation of a verb does not differ among languages as illustrated in (1a-c), the verb must be located in the same structural position in all languages, as I argue below.

objects. Chomsky (2001) argues that a weak object pronoun moves to [Spec,v*P], following V-v* movement, and that it moves across negation in PHON. However, Holmberg's data in fact show that the categories vacating from VP must move into the CP domain before object movement occurs due to the V2 property. The main verb *visar* cannot be spelled out in any other positions than C (5).⁴ These data show that it is insufficient to argue that a verb has only to vacate v*P earlier than an object pronoun. That is, it must be argued that a verb should move to C before an object pronoun moves, thus, verb movement (to C) must obligatorily take place in Narrow Syntax.^{5,6}

- (5) a. Henne (^{OK}visar) jag (*visar) den helst inte (*visar). (Swe.)
 her show I show it rather not show
 'I'd rather not show it to HER.'
 (Holmberg 1999:17,(43b))
- b. [_{CP} henne visar [_{TP} jag (*visar) [_{v*P} den [_{v*P} helst [_{v*P} inte [_{v*P} (*visar) [_{VP} visar henne den]]]]]]]]]

Third, verb movement is subject to more a strict locality condition than phrasal movement (the *Head Movement Constraint* HMC, Travis 1984). Only the highest Aux(iliary) can move in *yes-no* questions (6a-b), whereas either a direct object (7a) or an indirect object (7b) can move due to focus movement of phrases.

⁴ I focus on verb movement, since an indirect object moves, through [Spec,v*P], to [Spec,CP] in Narrow Syntax.

⁵ Matushansky (2006:100) points out that if V-v* movement occurs in PHON, it is impossible for *embrasse* in V (4a) to move to v* after the complement of v*, VP, is spelled out on the assumption of the *Phase Impenetrability Condition* PIC (Chomsky 2001). But Chomsky (2001) in fact assumes that V-v* movement occurs in Narrow Syntax.

⁶ See, e.g. Hornstein (2001) and Nunes (2004) for the account of verb movement in NS in terms of sideward movement. See Koopman and Szabolcsi (2000) for the way of deriving verb movement by remnant VP movement. See Fanselow (2009) for the proposal to assume that a raised verbal head reprojects.

(6) a. Have you ~~have~~ been able to do it? (=2a)

b. *Been you have ~~been~~ able to do it?

(7) a. A SWEATER, I gave a sweater to John (, not a SHIRT). (=3a)

b. To JOHN I gave a sweater to John (, not to BILL).

It is assumed in the current framework that the computation of human language proceeds in a uniform way in Narrow Syntax and the semantic component SEM (the *Uniformity Principle*, Chomsky 2001). This assumption is ensured by the cartographic system (Rizzi 1997, Cinque 1999), in which the position where a category is located in Narrow Syntax corresponds to, and must correspond to, the interpretation that the category receives in SEM in all languages. Thus, a category that is located in, e.g. [Spec,FocP], in Narrow Syntax is, and must be, interpreted as focus in SEM in all languages, and vice versa. In this phase-cartographic system a category is interpreted in the moved position, being raised by (the [Edge] feature of) a feature in a functional head. It is not necessary to assume any uninterpretable features as the trigger of movement. A feature in a functional head can freely choose a category that it ‘wants to’ raise. Thus, the local nature of verb movement is problematic, since a feature in a functional head could freely seek and raise either one of the verbal heads as in phrasal movement, contrary to fact.

Fourth and finally, languages differ in the positions in which a verb appears. On the assumption of the uniformity of Narrow Syntax and SEM the

verbs in (1a-c) should move to the same structural position, plausibly to the highest position, as long as the interpretation does not differ between them. The surface difference should be attributed to which position, the position in the v*P domain in English (8a), that in the TP domain in French (8b), or that in the CP domain in Swedish (8c), is spelled out in PHON (cf. Groat and O’Neil 1996).⁷

- (8) a. [CP kisses [TP ... kisses [v*P ... kisses [VP kisses ...]]]] (=1a)
 b. [CP embrasse [TP ... embrasse [v*P ... embrasse [VP embrasse ...]]]] (=1b)
 c. [CP ... kysser [TP ... kysser [v*P ... kysser [VP kysser ...]]]] (=1c)

3. Verb movement as tense operator movement

According to the traditional literature on tense logic, tense is like an operator that ranges over a whole sentence (e.g. Quine 1960, Montague 1973). But at the same time it is like a variable with the anaphoric properties similar to pronouns taken into account (e.g. Partee 1973). Regarding the movement of *wh*-subjects, Chomsky (2008) proposes, against the traditional assumption of cyclic movement, that the feature [Agree] inherited from C to T and the [Edge] feature in C raise a *wh*-subject to [Spec,TP] and [Spec,CP] respectively in a parallel manner.⁸ Since the occurrence of the *wh*-subject in [Spec,CP] does not make a chain with that in [Spec,TP], the problem of a non-uniform chain with a mixed nature of A’-A does not arise.

On the basis of the literature summarized, I firstly propose i) that the feature [T] in T introduces a variable, T_{Var} , whereas the Fin(iteness) feature in C,

⁷ Platzack (2010) proposes that syntactic structures are built in Narrow Syntax without moving a verb and the verb is freely spelled out in a position inside a verbal projection by the rules in PHON. See his paper for the details.

⁸ The movement of *wh*-objects, on the other hand, is assumed to be a cyclic movement from [Spec,v*P] to [Spec,CP].

[Fin] (cf. Holmberg and Platzack 1995), introduces a tense operator, T_{Op} , which specifies the value of a tense variable as present, past, etc. Second, I propose that the derivation of verb movement proceeds in Narrow Syntax in the way analogous to the derivation of *wh*-subjects proposed by Chomsky (2008).⁹ Assume i) that [T] in T raises v^*-V ,¹⁰ the latter remerges to the root of TP (cf. Matushansky 2006),¹¹ and the occurrences of the raised verb make a variable verb chain, on one hand, and ii) that [Fin] in C raises v^*-V , and the latter directly remerges to the root of CP and functions as the tense operator that ranges over the variable verb chain, on the other. Specifically in (9), after T merges to v^*P , [T], which introduces T_{Var} , raises the v^*-V *kisses*₃. The latter remerges to the root of TP. The two occurrences of *kisses* make a variable verb chain (i.e. (*kisses*₂,*kisses*₃)_{<var>}). After C merges to TP, [Fin], which introduces T_{Op} , raises the v^*-V *kisses*₃. The latter remerges to the root of CP directly. The raised verb *kisses*₁ functions as the tense operator that ranges over the variable verb chain and specifies its value as present PRES. In languages like English the verb in the v^*P domain, i.e. *kisses*₃, is spelled out in PHON.¹² With the proposal here I argue that verb movement is formulated as tense operator movement.¹³ An operator must move in Narrow Syntax to range over variables. Thus, verb

⁹ Hereafter, I concentrate on the way of deriving verb movement from the $v(*)P$ domain to the TP and CP domains, assuming that a verb has already moved from V into the $v(*)P$ domain in Narrow Syntax. See Matushansky (2006) and Branigan (2011) for the derivation of V- v^* in Narrow Syntax. I omit all the details of the derivation of the sentential elements other than verbs except when I notate.

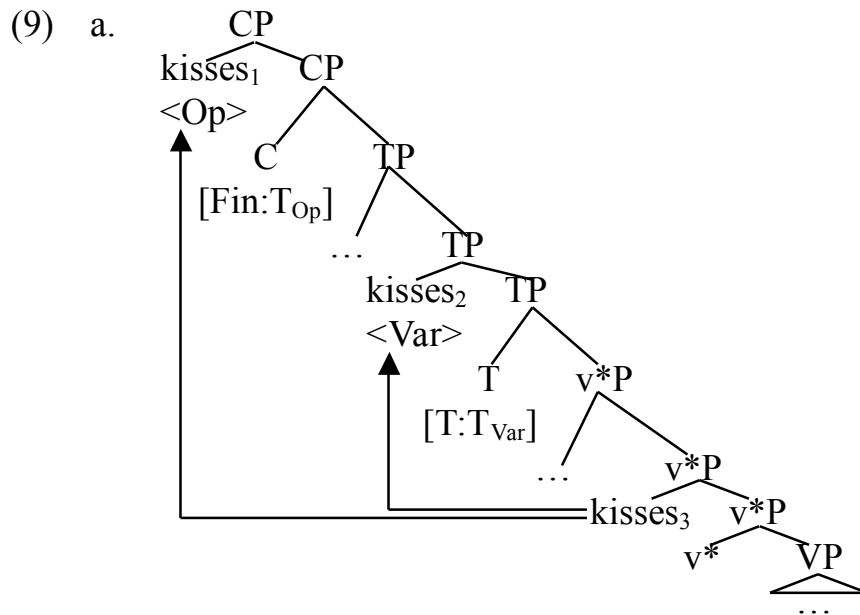
¹⁰ Strictly speaking, it is the Edge/EPP feature of a feature in a functional head that actually raises a category. For convenience' sake, I simply say that a functional feature, e.g. [T], [Fin], etc., raises a category.

¹¹ Matushansky assumes that a head moves to [Spec,XP]. In the current bare phrase structure system in which a syntactic derivation proceeds with Merge, it does not make sense to say, e.g., that a category moves 'to the Spec' of a functional head. I assume that a verbal head moves and simply merges to the root.

¹² I turn to the issue of spelled-out positions of a verb in the next section.

¹³ See, e.g. Stechow (2004) for an argument that a verb functions as a quantificational operator.

movement as tense operator movement must occur in Narrow Syntax.^{14,15}



- b. (kisses₂,kisses₃)_{<Var>} – variable verb chain
 kisses_{1<Op>} – tense operator that specifies the value of the verb chain as PRES

¹⁴ The way of deriving verb movement proposed here is briefly suggested by Roberts (2010:202-203). But he does not theoretically deepen this possibility. He proposes that a defective goal is incorporated into a probe head, which he argues applies to both verb movement and clitic climbing. See his book for the details.

¹⁵ Anders Holmberg (p.c.) suggests that a built structure might have two tense operators, one in [Fin] and the other in a finite verb. In the current system a category is interpreted in the moved position. In the same way as in, e.g. *wh*-movement in which a *wh*-phrase must move to the operator position in Narrow Syntax to function as a *wh*-operator, a verb must move in Narrow Syntax to function as a tense operator. He also suggests the possibility that a verb could be related to [Fin] by the Agree relation without movement. For a support of his argument he gives the case of concord in which the tense value of a verb in a main clause percolates to a verb in an embedded clause: e.g. *he said that he would/*will go to cinema today*. There is no reason, however, to assume any uninterpretable features, thus the Agree operation, for the relation between a verb and tense/finiteness.

4. Accounts of the issues related to head movement

4.1. Traditional issues

I discuss the issues related to head movement and provide accounts for them in turn. The movement operation proposed above is not that of adjunction. Thus, a raised head does c-command its occurrence in the lower position. The movement operation does not violate the Extension Condition (Chomsky 1995). The variable verb chain in (9), i.e. $\langle \text{kisses}_2, \text{kisses}_3 \rangle$, is uniform since it consists of the occurrence of a verb that merges to TP kisses_2 and the one that merges to $v^*P \text{kisses}_3$.

The surface position of a finite verb can differ among different languages. T is not only the locus of [T] but also that of [Agree] (which is inherited from C; cf. Chomsky 2008). Thus, v^*-V tends to be spelled out in the TP domain in, e.g. the Romance languages, which show a correlation between the presence of verb movement and that of rich tense-agreement morphological inflection. The v^*-V raised by [Fin] does not make a chain with that raised by [T]. Thus, the presence of verb movement is not associated with the richness of morphological inflection in the languages in which v^*-V tends to be spelled out in the CP domain, e.g. in the Germanic languages that have finiteness but do not have as rich an agreement system as the Romance languages. It is predicted that v^*-V tends to be spelled out in the $v(^*)P$ domain in the languages that neither have a rich agreement system nor always reflect finiteness on the verb. This is attested by languages with a relatively poor agreement system like English, in which finiteness can be expressed on a dummy verb, i.e. by *do*-support, with v^*-V appearing in an infinitival form.

A functional head *c-selects* the lower head just below it.¹⁶ C-selection is

¹⁶ C-selection is claimed to be the trigger of verb movement in the literature that advocate

formulated by Grimshaw (2000) as the *extended projection*: in the configuration [CP C [TP T [VP V]]] the verbal features of V spread up to TP and CP, and the heads V, T, C and their projections VP, TP, CP all share verbal features, which accounts for the locality between the adjacent heads. Whereas c-selection is accounted for in a ‘bottom-up’ manner in the literature referred to, it is desirably accounted for in a ‘top-down’ manner here. Namely, the value of a tense variable introduced by [T] is specified by the tense operator introduced by [Fin], i.e. only under the C-T configuration. The value of a verbal root is determined in the way that the tense value specified by the tense operator is shared by the occurrences in a variable verb chain. Thus, the c-selection property is derived not from the projection of verbal features to higher heads but from the transmission of the tense value specified by the tense operator introduced by [Fin] to lower heads.

4.2. The Head Movement Constraint

Verb movement is subject to more a strict locality condition than phrasal movement, i.e. the HMC (Travis 1984). The case in which the highest finite Aux moves is grammatical (10a). The case in which the second non-finite Aux moves is ungrammatical (10b). Note that the case in which the second Aux that has a finite form moves is also ungrammatical (10c). These data show that finiteness must occur on the highest Aux, that is, the highest Aux must be raised by the features in phasal heads in turn. This is problematic as we saw in section 2: a phasal head could freely seek a verb, contrary to fact.

- (10) a. Have you ~~have~~ been able to do it? (=6a)

verb movement as a Narrow Syntactic operation (e.g. Svenonius 1994, Julien 2000, Matushansky 2006).

- b. *Been you have ~~been~~ able to do it? (=6b)
- c. *Was you have ~~was~~ able to do it?

Why must the highest Aux have finiteness? We see below that one more meaning is added when an Aux increases. Namely, a finite main verb *arrested* expresses an event meaning that someone catches up with another and also carries the meaning of the past tense PAST (11a). A finite Aux *was* adds the meaning of passive PASS and also carries PAST, and a non-finite past participle Part *arrested* expresses the event (11b). The finite Aux *has* adds the meaning of perfect PERF, the non-finite Aux *been* carries PASS, and the non-finite Part *arrested* expresses the event (11c). The finite Aux *will* adds the meaning of future FUT, the non-finite Aux *have* carries PERF, the non-finite Aux *been* carries PASS, and the non-finite Part *arrested* expresses the event (11d).¹⁷

- (11) a. (The police) arrested John. – event(arrest)+PAST
- b. John was arrested (by the police). – event(arrest)+PAST+PASS(be)
- c. John has been arrested (...). – event(arrest)+PASS(be)+PERF(have)
- d. John will have been arrested (...)
– event(arrest)+PASS(be)+PERF(have)+FUT(will)

That only a finite verb among several verbal heads is raised to a higher position is generally observed in serial verb construction (12), in which only the finite Aux *had* that adds the PERF meaning is raised to a higher position.¹⁸

¹⁷ See Giorgi and Pianesi (1997) for a detailed discussion of tense and aspect and their morphological realization in the European languages.

¹⁸ (12) illustrates the case of *excorporation* (Roberts 1991). The standard claim on

- (12) Gisteren had ik [[[mijn vriendin op-bellen] willen] had] [had willen bellen].
 (Dut.)
 yesterday had I my girlfriend up-call want had had want call
 ‘Yesterday I wanted to call my girlfriend up.’
 (Roberts 1991:212,(5b))

A sentence is ungrammatical when a lower Aux/Part carries finiteness, regardless of whether verb movement occurs or not: e.g. (11c’) **John have-INF was-PAST arrested-PART*. Thus, the HMC is derived from the general constraint that the highest Aux must have finiteness to add a new meaning to an existing structure. A further question why this is so is answered by the proposal here that the verb raised by [Fin] functions as a tense operator. The tense operator associates an event that a verb expresses with our real world by specifying a tense value. Thus, only the verb that is raised by [Fin] and functions as the tense operator can add a new meaning to the event structure that has already been built.

4.3. Movement of focused non-finite verbs

A prediction from the proposal here is that the movement of a verb that does not have a tense specification and cannot function as a tense operator is caused by a feature other than [Fin]. This is in general attested by the movement of a Part to sentence-initial position observed in various languages. *Verb-Topicalization* in

excorporation is that verbal heads, both a finite form (*had*) and non-finite forms (*willen* and *bellen*), compose a head complex (*[had willen bellen]*). The finite form moves out of the complex to a higher position. This case is said to be exceptional in that the structure in which a word contains a trace is in general not allowed (Baker 1988). A main argument for verb clustering is that no constituent can intervene between any two verbal heads (Haider 2003). Note that the Aux is phonologically weak in the unmarked case. The reason why the Aux cannot be separated from the other verbal heads might be attributed to such phonological factors, which I leave for future research.

Swedish (Holmberg 1999) produces a focal effect on the raised Part *kysst* (13), which indicates that this movement is caused by [Foc] in C.

- (13) Kysst har jag henne inte (bara hållit henne i handen). (Swe.)
 kissed have I her not only held her by the hand
 ‘I didn’t KISS her (, but only held her in the arm).’
 (Holmberg 1999:7,(11a))

A Part can be raised to sentence-initial position also in languages such as Breton, Serbo-Croatian, etc. (*Long Verb Movement*, Borsley et al. 1996) (14a). Breton has SVO as the unmarked order, unlike the other Celtic languages that have the unmarked VSO order (Ternes 1992).¹⁹ Changing the word order yields a focal effect on the sentence-initial element (Ternes 1992, Press 1986). Though the verb-first order is ungrammatical in the unmarked case, it can be grammatical when the Part raised to sentence-initial position is focused (Press 1986). These statements indicate that the movement of a Part is triggered by [Foc]. This is attested by the fact that the raised Part cannot cooccur with a *wh*-/focused phrase (14b), since a sentence can have one and only one focus (Lambrecht 1994).^{20,21}

¹⁹ In Breton finite verbs except the copula cannot come to sentence-initial position (i), unlike in the other Celtic languages (ii).

- i) *Lenn Anna al levr. (Bre.)
 read Anna the book
 ‘Anna reads the book.’
 (Borsley et al. 1996:62,(37))
- ii) Gwelodd Rhiannon ddraig. (Wel.)
 see-3sg-PAST Rhiannon dragon
 ‘Rhiannon saw a dragon.’
 (Borsley et al. 2007:33,(1))

²⁰ If the movement of a non-finite verb is triggered by [Foc], it is predicted that the Part movement is subject to the island constraints, i.e. the constraints on the Complex NP island, the Subject island, and the Adjunct island. This prediction is attested. See Roberts (2010).

²¹ As is predicted, a raised finite verb can cooccur with a *wh*-/focused phrase in the Celtic languages other than Breton.

- i) Beth glywaist ti wedyn? (Wel.)

- (14) a. Lennet en deus Yann al levr. (Bre.)
 read 3sg-MASC has Yann the book
 ‘Yann has read the book.’
 (Borsley et al. 1996:53,(1))
- b. Al levr (*lennet) en deus (^{OK}lennet) Tom.
 the book read 3sg-MASC has read Tom
 ‘Tom has read the BOOK.’
 (Borsley et al. 1996:60,(28a-b))

The derivation of, e.g. (13) proceeds as in (15).²² I assume that both [Foc] and [Fin] lie in C. After T is merged to vP, [T], which introduces T_{Var} , raises the Aux har_3 .²³ The latter remerges to the root of TP. The two occurrences of har make a variable verb chain (i.e. $(har_2, har_3)_{<Var>}$). After C merges to TP, [Fin], which introduces T_{Op} , raises har_3 . The latter remerges to the root of CP directly. The raised verb har_1 functions as the tense operator that ranges over the variable verb chain and specifies its value as PERF. On the other hand, [Foc] raises the focused v*-V Part $kysst_2$.²⁴ The latter remerges to the root of CP, to the position higher than the Aux. The two occurrences of $kysst$ make a focus operator-variable chain (i.e. $(kysst_1, kysst_2)_{<Foc>}$).²⁵ The highest occurrences har_1 and $kysst_1$ are spelled out in PHON.

what hear-2sg-PAST you afterwards
 ‘What did you hear afterwards.’
 (Borsley et al. 2007:106,(5))

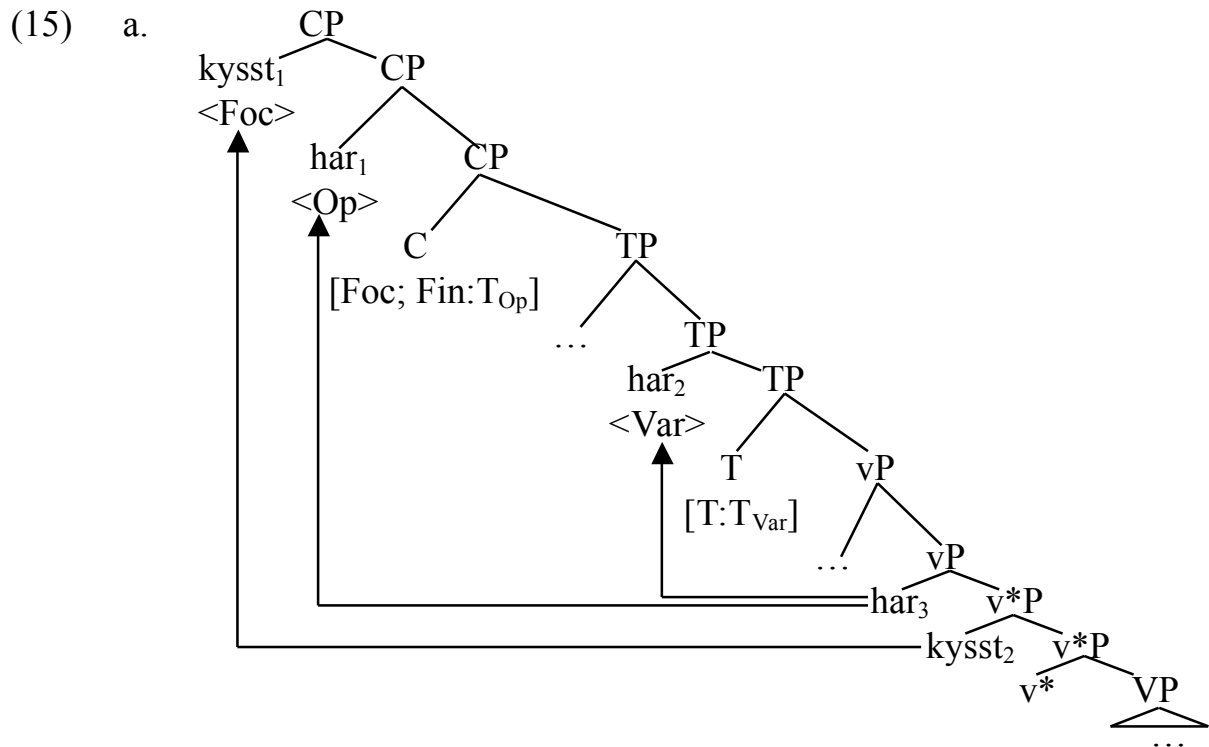
These facts show that whereas (non-finite) verbs are raised by [Foc] in Breton, verbs in the other Celtic languages are raised by [Fin], which indicates that Breton is in fact not a VSO language, whereas the other Celtic languages are ‘true’ VSO languages.

²² I assume here that the Aux is base-generated as a v head that takes a v(*)P as its complement.

²³ According to Holmberg (1999), an Aux follows a sentential adverb like negation in embedded clauses in Mainland Scandinavian, which indicates that an Aux, and a Part too, are base-generated in the positions lower than negation. I tentatively assume here that a subject is base-generated in [Spec,vP] and negation is adjoined to vP, the position higher than a subject.

²⁴ Chomsky (2001) assumes PartP. I simply assume here that a Part is raised by v* and remerges to the root of v*P. The derivation does not violate the PIC, since v is not a phase head.

²⁵ See Kiss (1998) for an argument that a focused constituent functions as a focus operator.



- b. $(har_2, har_3)_{\langle Var \rangle}$ – variable verb chain
 $har_1_{\langle Op \rangle}$ – tense operator that specifies the value of the verb chain as PERF
 $(kysst_1, kysst_2)_{\langle Foc \rangle}$ – focus operator-variable chain

4.4. Movement of focused finite verbs

In addition to the cases in which a non-finite verb is focused, we find the cases in which a finite verb is focused. A focused finite verb appears in the CP domain in languages like Icelandic (16).²⁶

- (16) Ég KEYPTI hana ekki. (Ice.)
 I bought her not
 'I didn't BUY it.'

The situation in, e.g. Vata, is somewhat complicated. A verb is inflected

²⁶ Christer Platzack (p.c.) suggests that the situation is the same in Swedish. This so-called *verum-focus* appears to be found in all Scandinavian languages.

for either perfect or imperfect and follows a subject in a normal declarative sentence (17a). When a focal effect is produced on a verb, one inflected for imperfect is duplicated and appears in more than one position (17b). A verb inflected for perfect, however, cannot be duplicated. Instead, a non-finite form is duplicated, and a tense particle is attached to one of the duplicated forms. One form appears in sentence-initial position, and the other appears either in the TP domain (17c) or in the v*P domain (17d). The verb that appears in the TP domain is adjacent to the tense particle but the verb that appears in the v*P domain is separated from it. Significantly, the tense particle cannot occur with the verb in sentence-initial position (17e).

- (17) a. *ń li sáká.* (Vat.)
 I eat-PERF rice
 ‘I ate rice.’
 (Koopman 1984:28,(27c))
- b. *le à le sa□ka.*
 eat-IMPERF we eat-IMPERF rice
 ‘We are really EATING rice./We are EATING rice.’
 (Koopman 1984:38,(50a))
- c. *li à li-dā zué sáká.*
 eat we eat-PAST yesterday rice
 ‘We ATE rice yesterday.’
 (Koopman 1984:38,(51a))
- d. *li Ó dā sáká li.*
 eat she/he PAST-AUX rice eat
 ‘She/he has EATEN rice.’
 (Koopman 1984:38,(50b))
- e. *li (*wa) wá li-wá zué.*
 eat(-PAST) they eat-PAST yesterday
 ‘They ATE yesterday.’
 (Koopman 1984:156,(8c))

Also in Brazilian Sign Language BSL duplication of a main verb produces a focal effect on the verb (18a). Nunes (2004) states that duplication of a main verb is not allowed when agreement inflection (represented by alphabet indices) appears on the verb (18b).²⁷

- (18) a. I LOSE Book LOSE. (BSL)
 ‘I LOST the book.’
 (Nunes 2004:57,(115c))
- b. John (*_aLOOK_b) Mary _aLOOK_b.
 ‘John LOOKED AT Mary.’
 (Nunes 2004:58,(119c))

In general agreement morphology is not prevented from appearing in the CP domain, as illustrated by the case of complementizer agreement (19). All of these data show that when a verb with a finite form is raised by both [Foc] and [Fin] in C, tense-agreement morphology may not always be able to occur on the verb in the CP domain.^{28,29,30}

²⁷ The actual situation in BSL is complicated, since a focused phrase in general appears in sentence-final position (Nunes 2004). A verb appears in a sentence-medial position in the unmarked case. Thus, it might be the case that agreement inflection cannot appear in the sentence-final, highest position. According to Nunes, however, the focus construction like (18) is derived by remnant movement: first, a focused verb moves out of TP and adjoins to the Foc head, and second, the rest of the sentence moves to [Spec,FocP]. This indicates that the sentence-final focused verb is located in the position lower than the one in which the sentence-medial doubled verb is located. I do not go into the details of this issue.

²⁸ In the case of complementizer agreement C does not have [Foc]. It possibly has [Force] (Rizzi 1997, Branigan 2011), which links argument structure with discourse structure.

²⁹ An interesting data comes from Swedish. A finite form *såg* can move to sentence-initial position, with a dummy verb *göra* ‘do’ inflected too:

- i) Såg gjorde han på henne (men han sa ingenting) (Swe.)
 looked did he at her but he said nothing
 ‘Looked at her he did, but he said nothing.’
 (Holmberg 1999:12,(34a))

- (19) a. Kpeinzen *dan-k* (ik) morgen goan. (West Fle.)
 I-think that-I (I) tomorrow go
 ‘I think that I’ll go tomorrow.’
- b. Kpeinzen *da-j* (gie) morgen goat.
 I-think that-you (you) tomorrow go
 ‘I think that you’ll go tomorrow.’
 (Carstens 2003,(1a-b))

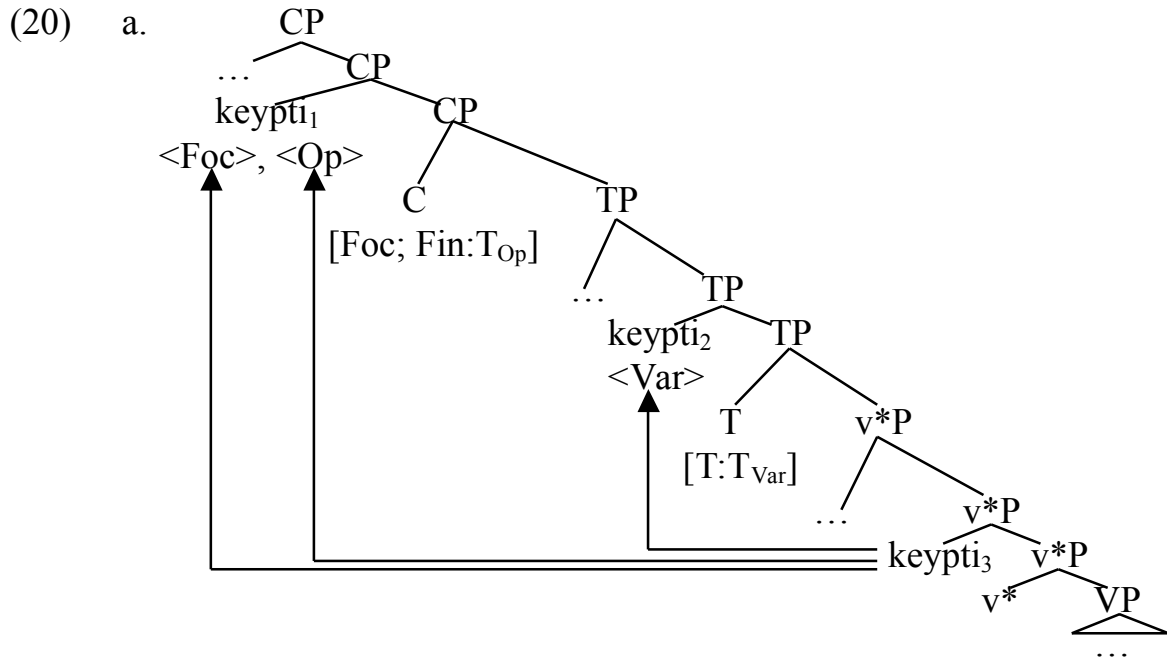
The derivation of (16) proceeds as in (20). After T, which introduces T_{Var} , is merged to v*P, the v*-V *keypti*₃ moves and remerges to the root of TP. The two occurrences of *keypti* make a variable verb chain (i.e. (*keypti*₂,*keypti*₃)_{<Var>}). After C merges to TP, both [Fin], which introduces T_{Op} , and [Foc] raise the v*-V *keypti*₃. The latter remerges to the root of CP directly. The raised verb *keypti*₁ functions as the tense operator that ranges over the variable verb chain and specifies its value as PAST, on one hand. It makes a focus operator-variable chain with its occurrence (i.e. (*keypti*₁,*keypti*₃)_{<Foc>}), on the other. The highest occurrence *keypti*₁ is spelled out in PHON.^{31,32}

The semantic effect of this construction is contrastive topic of the verb (phrase). I leave this issue for future research.

³⁰ See Miyagawa (2010) for an argument that a discourse-related feature lies in C and it is realized by the Agree relation in some languages and by the topic/focus relation in others. See also Corbett (2006) for the data of Lavukaleve, a Papuan language, in which agreement morphology functions as a focus marker.

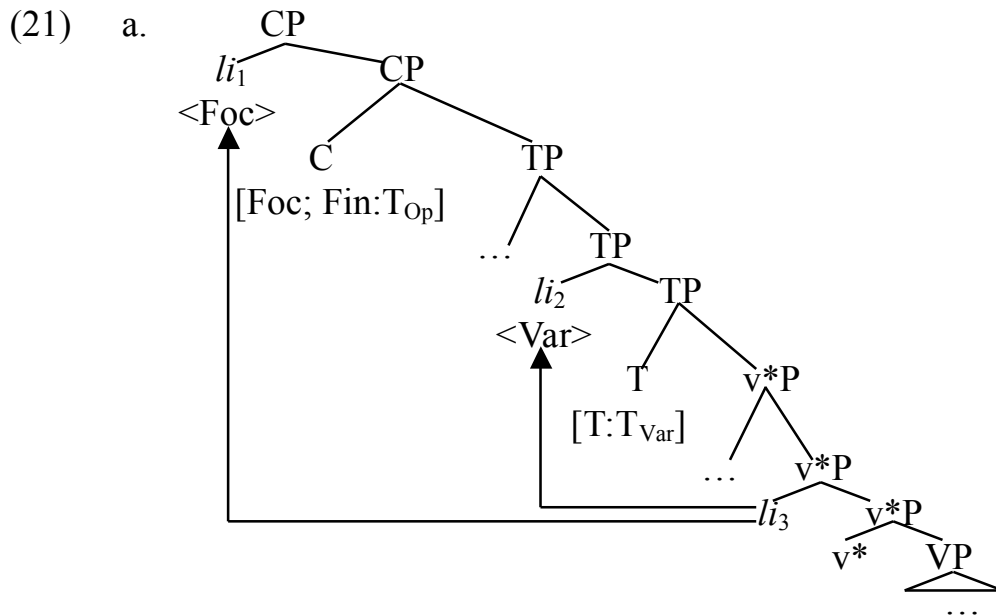
³¹ In languages like English (e.g. *I ATE the apple*) the verb in the v*P domain is spelled out in PHON.

³² Nothing in the phase system prevents the way of derivation proposed here in which more than one head feature raises a same sentential element, unlike the derivational way in which a head feature raises more than one sentential element: the latter could yield the intervention effect (Chomsky 2001). Note also that the way of derivation proposed here cannot be carried out in the cartographic system, where it is assumed that one head can have only one feature that can raise a sentential element. The assumption here that one head can have more than one feature is preferable to the one assumed in the cartographic system, with taken into account the V2 languages in which more than one interpretation, topic, focus, etc, is produced in sentence-initial position.



- b. $(keypri_2, keypti_3)_{<Var>}$ – variable verb chain
 $keypti_1_{<Op>}$ – tense operator that specifies the value of the verb chain as PAST
 $(keypti_1, keypti_3)_{<Foc>}$ – focus operator-variable chain

In the case like Vata in which tense-agreement morphology cannot appear on the verb in the CP domain, I assume that T_{Op} introduced by [Fin] itself functions as a tense operator that ranges over a variable verb chain, with [Fin] not raising v^*-V . Specifically, the derivations of (17c-d) proceed as in (21). After T is merged to v^*P , [T], which introduces T_{Var} , raises the v^*-V li_3 . The latter remerges to the root of TP. The two occurrences of li make a variable verb chain (i.e. $(li_2, li_3)_{<Var>}$). After C merges to TP, [Fin] introduces T_{Op} . The latter itself functions as the tense operator that ranges over the variable verb chain and specifies its value as PAST. [Foc], on the other hand, raises the v^*-V li_3 . The latter remerges to the root of CP directly. The raised verb li_1 makes a focus operator-variable chain with its occurrence (i.e. $(li_1, li_3)_{<Foc>}$). The highest occurrence li_1 is spelled out in the focus operator-variable chain. Since [Fin] does not raise v^*-V , one of the occurrences in the variable verb chain, either the one in the TP domain (17b) or the one in the v^*P domain (17c), is spelled out in PHON.



- b. $(li_2, li_3)_{<Var>}$ – variable verb chain
 T_{Op} – tense operator that specifies the value of the verb chain as PAST
 $(li_1, li_3)_{<Foc>}$ – focus operator-variable chain

4.5. Clitic climbing

Finally, I refer to the way of deriving clitic climbing (Kayne 1989b), which has long been discussed together with verb movement under the theory of head movement: a clitic behaves as if it were a head regarding its movement, though it is interpreted as an argument of a verb. Below, the clitic *lo* is attached to either a lexical verb *fare* that takes it as a complement (22a) or T (22b). According to Chomsky (1995:249; see also Kayne 1989b), the clitic is generated in a complement position as a maximal projection; it moves to a functional head as a head.³³

- (22) a. Gianni vuole farlo. (Ita.)
 Gianni wants to-do-it
 ‘Gianni wants to do it.’

³³ According to the base-generation hypothesis (e.g. Borer 1984, Suñer 1988), the clitic is assumed to be an agreement morpheme that is generated under a functional head. Sportiche (1999) proposes an eclectic analysis between the movement hypothesis and the base-generation hypothesis and assumes a Clitic Phrase. For an argument against him, see Matushansky (2006).

- b. Gianni lo vuole fare.
Gianni it wants to-do
'Gianni wants to do it.'

Following Everett (2000) and Roberts (2010), I assume that the clitic is a collection of ϕ -features that has a head status. The most plausible probe candidates that raise clitics are $[u-\phi]$ inherited from v^* to V (cf. Chomsky 2008) and [Agree] inherited from C to T, with the agreement-like properties of the clitics taken into account. I illustrate the derivations of the finite verb *vuole* and the clitic *lo* in (23).³⁴ After C merges to (the lower) TP, [Agree] is inherited from C to T. The clitic in situ lo_4 moves and remerges to the root of (the lower) TP.³⁵ After V (= *vuole*) and v^* merge in turn, $[u-\phi]$ is inherited from (the upper) v^* to (the upper) V. The clitic lo_3 moves and remerges to the root of (the upper) VP. After T and C merge in turn, [Agree] is inherited from C to T. The clitic lo_2 moves and remerges to the root of (the upper) TP. All the occurrences of *lo* make a clitic chain (i.e. $(lo_1, lo_2, lo_3, lo_4)_{[\phi]}$). On the other hand, (the upper) T introduces T_{Var} . $Vuole_3$, which has already been raised from V to v^* , moves and remerges to the root of (the upper) TP.³⁶ The two occurrences of *vuole* make a variable verb chain (i.e. $(vuole_2, vuole_3)_{\langle Var \rangle}$). [Fin] in C introduces T_{Op} and raises the v^* -V $vuole_3$. The latter remerges to the root of (the upper) CP directly. The raised verb $vuole_1$ functions as the tense operator that ranges over the variable verb chain and specifies its value as PRES. The occurrence of the verb

³⁴ Much literature (e.g. Roberts 1991) assume that the clitic moves through all intermediate functional head positions. The way of derivation will be complicated if we also take the Part agreement into account (Kayne 1989a):

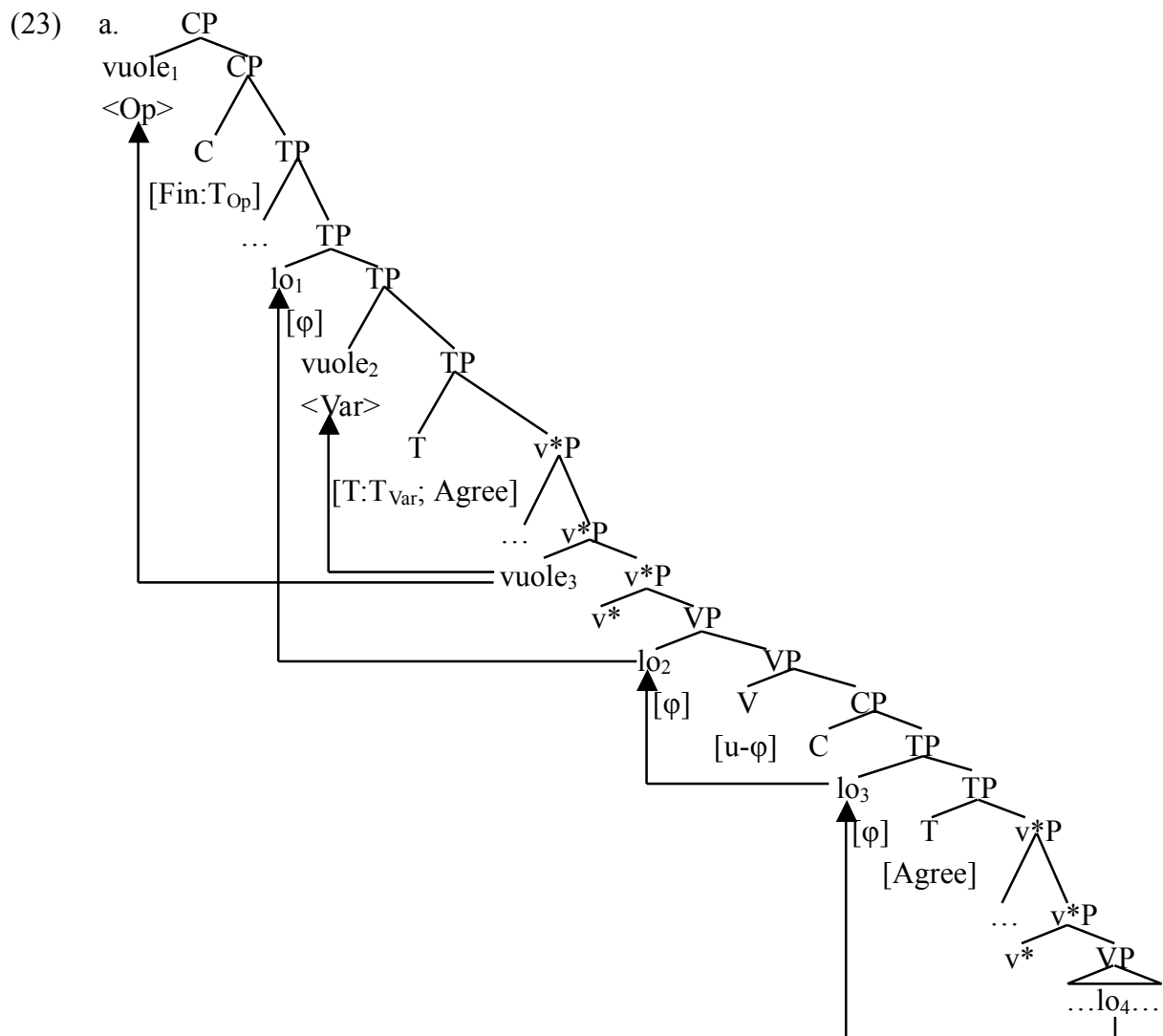
- i) Paul les a repeintes.
Paul them have-3sg-PAST repaint-FEM-3pl
'Paul has repainted them (e.g. les chaises (the chairs-FEM.pl)).'
(Kayne 1989a:85,(2))

I omit the details here.

³⁵ Following Chomsky (2008), (the lower) v^* would inherit its $[u-\phi]$ to V, and the clitic lo_4 would firstly remerge to the root of (the lower) VP. I omit the details for convenience sake.

³⁶ A verb remerges to the position lower than the one which a clitic moves to, i.e. remerges nearer to T than a clitic, possibly due to the morphological requirement on the verb in PHON.

in (the upper) TP *vuole₂* and the highest occurrence of the clitic *lo₁* are spelled out in PHON. Note that *lo₁* raised by [Agree] does not function as an operator unlike the highest occurrence of a verb raised by [Fin] *vuole₁*. This accounts for the difference between verb movement and clitic climbing, thus the particular status of the latter: the clitic is raised as a head, but the highest occurrence does not function as an operator due to its argument status, unlike a verb.³⁷



³⁷ Another issue on head movement is *incorporation* (Baker 1988). According to Lambrecht and Polinsky (1997), the incorporation construction is sentence-focus that contains only new information, whereas the non-incorporation construction is predicate-focus that has a topic-comment structure. Their argument indicates that the incorporation construction does affect the change in the meaning of a sentence. I leave the formalization of the feature that causes incorporation for future research.

- b. $(lo_1, lo_2, lo_3, lo_4)_{[\varphi]}$ – clitic chain
 $(vuole_2, vuole_3)_{\langle Var \rangle}$ – variable verb chain
 $vuole_1_{\langle Op \rangle}$ – tense operator that specifies the value of the verb chain as PRES

5. Conclusion

In this paper I have proposed a way of deriving verb movement in Narrow Syntax. I proposed that [T] in T introduces a variable, T_{Var} , whereas [Fin] in C introduces a tense operator, T_{Op} , which specifies the value of a tense variable as present, past, etc. I also proposed, in analogous to the derivation of *wh*-subjects proposed by Chomsky (2008), i) that [T] raises v^*-V , the latter remerges to the root of TP, and the occurrences of the raised verb make a variable verb chain, on one hand, and ii) that [Fin] raises v^*-V , and the latter directly remerges to the root of CP and functions as the tense operator that ranges over the variable verb chain, on the other. With this proposal I provided accounts not only for traditional issues but also for the Head Movement Constraint, movement of focused non-finite/finite verbs, and clitic climbing.

As I claimed in section 3, verb movement, which is formulated as tense operator movement, must occur in Narrow Syntax for a verbal head to range over a variable verb chain as an operator in the raised position. On the assumption of bare phrase structure, movement is carried out in the way that a category, whether it is a phrase or a head, moves and simply merges to the root. No uninterpretable features are involved in the relationship between [T] and a verb on one hand, and between [Fin] and a verb on the other. [T] and [Fin] simply raise a verb, as the [Edge] feature (Chomsky 2008) does for, e.g. *wh*-movement. Thus, verb movement is quite analogous to A'-bar movement, in which an operator chain is always made by a raised category and its

occurrence(s). The proposal and arguments here indicate that all kinds of movement are classified into either operator movement in which no uninterpretable features are involved, including both verb movement and A'-bar movement, or non-operator movement in which uninterpretable features are involved in the relationship between a probe head and its goal, which is represented by A-movement.³⁸ This conclusion supports the argument by Chomsky (2008:150): the distinction between A- and A'- is made not by the structural position to which a category moves, but by the way of deriving that position.

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³⁸ The mixed status of clitic climbing is accounted for in section 4.5.

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