

On Mismatch between Verb Position and Verbal Morphology

From Agrammatic Aphasiological Data

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1. Overview

The present paper will discuss the relation between verb position and verbal morphology. Specifically, I will examine an error around verb position and verbal morphology in speech data by agrammatic aphasics. The morphology-as-input approach(e.g., (strong) Lexicalism) and the syntax-driven morphology approach (e.g., Distributed Morphology) will make a different prediction on what kinds of error about verb position and verbal morphology should be observed and should not be observed and I will testify which prediction is supported by examining aphasiological data.

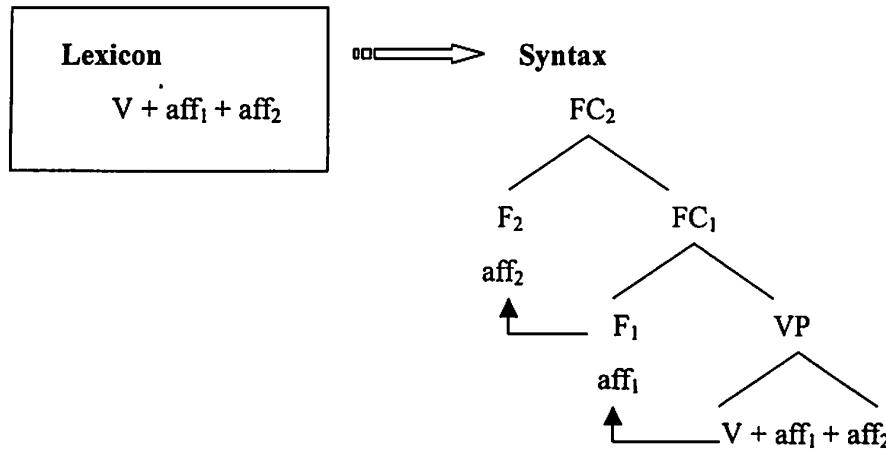
In the first half of section 3 I will point out some examples that seem to cast some problems to Distributed Morphology, but if we closely scrutinize such problematic examples by, for example considering parametric variation on clause structure put forth by Bobaljik & Thráinsson (1998), the problems will disappear. In the latter half of section 3, however, I will present other problematic cases that are inconsistent with Distributed Morphology.

The collected speech data on agrammatic aphasics will be related to a discussion of whether verb movement is caused by rich morphology of a verb (i.e., the Rich Agreement Hypothesis) or there is no causal relation between verb movement and verbal morphology. In section 4 I will touch the issue in terms of aphasiological data.

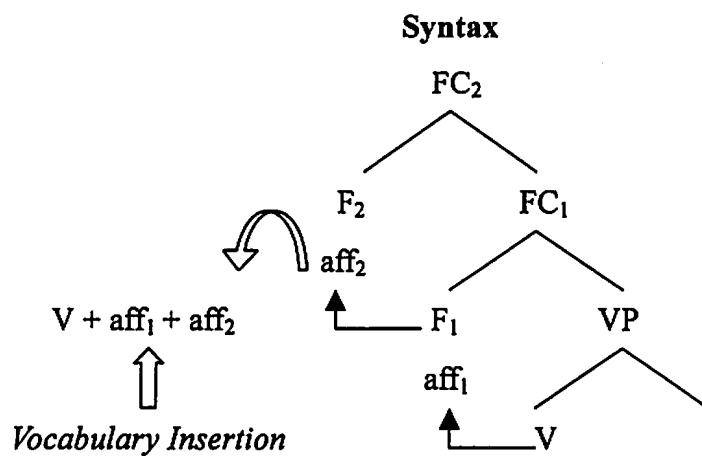
2. Two morphological theories and their predictions

At least two approaches to morphosyntax have been suggested. One is the morphology-as-input approach, in which morphology determines syntactic behavior. As a position that naturally fits well with this approach, there is (strong) lexicalist conception (e.g., Di Sciullo & Williams 1987), where morphological component is placed as an input to syntax and inflectional morphemes as well as derivational ones attach to a verb in a pre-syntactic, morphological, component. Regarding verbal morphology, for example, a verb is

retrieved from the lexicon fully inflected and moves to a functional category or categories where the inflectional features of a verb can be checked against the inflectional features present on a functional category or categories.



The other approach is the syntax-driven morphology approach, according to which syntactic behavior determines morphological forms. One account proposed by Halle & Marantz (1993) which is called *Distributed Morphology* is a representative of this approach. In Distributed Morphology the syntactic derivation collects abstract inflectional features that are an input to morphological component and are mapped onto morpheme after the syntactic derivation is complete (*Vocabulary Insertion*). For example, a (root) verb undergoes verb movement to functional categories, picking up inflectional features. The featural complex form collected by verb movement is converted to morphological form via *Vocabulary Insertion*.



A crucial difference between two approaches that will be relevant below is the localization of morphology in a theory of grammar: in Distributed Morphology verb movement is an input to verbal morphology; in contrast, in lexicalism verb movement and verbal morphology are independent.

The present paper will deal with a mismatch between verb position and verbal morphology, which will tell us which approach is more plausible. For the moment, I will assume a split INFL type of clause structure and assume that a verb has to move to functional categories in order to get inflectional features. There are four logical possibilities in the correlation between verb position (i.e., within VP or outside VP) and verbal morphology (i.e., inflected or uninflected). More concretely, (i) verb position is outside VP and verb is correctly inflected, (ii) verb position is outside VP, but verb is uninflected, (iii) verb position is within VP, but verb is correctly inflected, and (iv) verb position is within VP and verb is uninflected. I will call types (ii) and (iii) the *mismatch type* in that a mismatch between verb position and verbal morphology occurs.

	Verb Position	Verbal Morphology
Type 1 (Match)	outside VP	correctly inflected
Type 2 (Mismatch)	outside VP	uninflected
Type 3 (Mismatch)	within VP	correctly inflected
Type 4 (Match)	within VP	uninflected

Now let us see how two approaches given above will treat these four types. First, I will examine Lexicalism with these four types, and then Distributed Morphology with them.

Type 1 under Lexicalism

In Lexicalism the type 1 is accounted for as follows: verbal morphology which is concatenated in the lexicon is a right form (i.e., verb is correctly inflected), and in syntax a verb moves to functional categories to collect inflectional features in accordance with syntactic principles (i.e., verb position is outside VP).

Mismatch Type 2 under Lexicalism

The mismatch type 2 in lexicalism is assumed to be that a verb is not concatenated to inflectional morphemes in the lexicon (i.e., a verb is uninflected) and is inserted into syntax, but in syntax some syntactic principles ensure correct verb movement to functional categories. As an output a situation where verb position is outside VP, but a verb is uninflected will be yielded.

Mismatch Type 3 under Lexicalism

Unlike the mismatch type 2 above, verbal morphology is formed correctly in the lexicon

(i.e., a verb is correctly inflected) and a fully-inflected verb is inserted into syntax. However, in syntax a verb fails to move to functional categories on grounds that, for example, syntactic principles that normally force verb movement to functional categories are inoperative in some reasons; therefore, a fully-inflected verb remains within VP.

Type 4 under Lexicalism

Like the mismatch type 2 above, a verb is not concatenated to inflectional morphemes in the lexicon (i.e., a verb is uninflected). Furthermore, in syntax verb movement fails on grounds that, for example, syntactic principles that normally force verb movement are inoperative in some reasons; therefore, an uninflected verb is within VP.

As noted above, Lexicalism provides an explanation for each type. How does Distributed Morphology treat these four types?

Type 1 under Distributed Morphology

A verb moves to functional categories in order to collect abstract inflectional features in line with syntactic principles; therefore, a verb is outside VP. In post-syntactic, morphological component the featural complex form is converted to correct morphological form (i.e., a verb is correctly inflected).

Mismatch Type 2 under Distributed Morphology

The mismatch type 2 in Distributed Morphology is handled in the following manner. Like the type 1, a verb moves to functional categories in syntax. After syntactic derivation is complete, a conversion from the featural complex form to morphological realization is not held appropriately; as a result, an uninflected (or incorrectly inflected) verb will be produced.

Mismatch Type 3 under Distributed Morphology

Crucially, Distributed Morphology will not provide an explanation for the mismatch type 2, which means that the mismatch type 2 is not allowed under Distributed Morphology. In other words, it is predicted that the mismatch type 2 never occurs under Distributed Morphology. The reason is that since in Distributed Morphology the featural complex form collected verb movement is an input to morphological form, if a verb cannot collect

inflectional features, it means that a verb will never be inflected in morphological component. Generally speaking, if an input is wrong, an output is never right. In Distributed Morphology where verb movement is an input to verbal morphology, a case in which a verb does not move to functional categories but it is correctly inflected never appears.

Type 4 under Distributed Morphology

The type 4 in Distributed Morphology is given an account as follows: a verb does not move to functional categories. As a result, the featural complex form is not formed. Therefore, a verb without inflectional features is converted to an uninflected form in morphological component.

As have been stated above, Lexicalism predicts that all four types may occur. On the other hand, Distributed Morphology makes a prediction that the types 1, 2, and 4 may occur, but the mismatch type 3 never occurs. Whether the mismatch type 3 is found or not distinguishes Lexicalism from Distributed Morphology. Below, I will testify which prediction is supported in terms of aphasiological data.

3. Aphasiological speech data on verbal morphology

In agrammatic speech production by agrammatic aphasics, morphology was traditionally regarded as most vulnerable in the aphasic disorder. Agrammatic aphasia is a language deficit following damage to the left cerebral hemisphere, usually at Broca's area and its vicinity. It is generally recognized that agrammatic aphasics suffer from a severe deficit in their ability to handle verbs. They have problems with verb inflection, and sometimes cannot place verb in a required position. Relevant here is whether a verb which is placed within VP has a correct inflection (the mismatch type 3).

3.1. Dutch agrammatic speech data

According to Koster (1975), Dutch is analyzed as SOV as an underlying word order (not a surface word order), meaning that the base-generated position of a verb is after an object. As shown in (1), in the matrix clause, a finite verb has to be moved to second position by a cyclic movement of V to functional categories, T and Agr.

- (1) [Agr Jan leest_i [TP t_i] [Agr het boek_j [VP t_j t_i]]]]
 John reads the book
 ‘John reads the book’

Focusing on matrix clauses (since generally speaking, agrammatic aphasics rarely produce subordinate clauses), I analyzed a large amount of raw data from Kolk, Heling, & Keyser (1990) and a series of work conducted by Dr. Bastiaanse (Bastiaanse & van Zonneveld 1998). Bastiaanse & van Zonneveld (1998) examine the relation between finiteness and verb position and report that 10 Dutch Broca’s aphasics they examined have problems moving verbs to the second position, but they do not have problems producing verbs in their base-generated position. Verbs in final position are always nonfinite, but verbs in second position are frequently substituted by nonfinite forms.

	Finite	Nonfinite
Verb second	24	17
Verb final	0	60

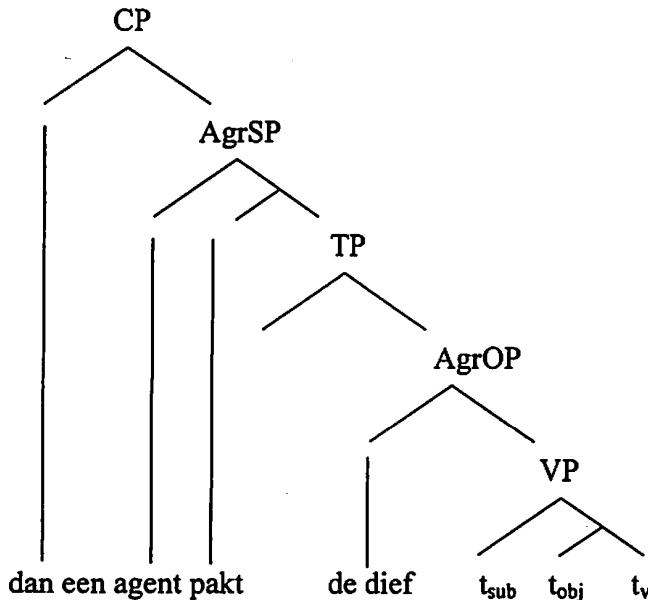
When a verb is required to move to the second position, agrammatic aphasics can put the verb in the correct position, but they often produce verbal morphology error in finiteness. This falls into the mismatch type 2, of which both Lexicalism and Distributed Morphology give an account. I will be back to these data in section 4.

As argued above, whether or not the mismatch type 3 is found is of relevance. If such cases are not found out, Distributed Morphology is preferable over Lexicalism in that the type that may be found due to Lexicalism cannot be found out, although it is necessary to investigate the observation that such cases do not exist is accidental or systematic. In raw data by Kolk, Heling & Keyser (1990), however, I found only one example of what apparently seems to be the mismatch type 3:

- (2) *eb dan een agent pakt de dief.
 and then a policeman catches the thief
 (Correct word order: eb dan pakt een agent de dief)
 ‘and then a policeman catches the thief.’

This example seems to be the mismatch type 3. The verb does not move to a required position, but the verb is correctly inflected. However, that a verb does not move to the second position does not necessarily mean that a verb is within VP. More concretely, on the assumptions that an adverb *dan* ‘then’ is in [Spec, CP], and functional categories, Agr and T, are head-initial, the example (2) can be analyzed as follows:

(3)



If functional categories are head-final, the wrong order produced, *pakt de dief*, is hard to analyze. Notice that an underlying word order is assumed to be SOV. No matter where the object is ([Spec, AgrOP] or within VP), the verb, *pakt*, necessarily resides in the domain of functional categories to derive the wrong word order produced, *pakt de dief*. What has to be noted is that the verb in the example (2) moves to functional categories, although it fails to move to second position. Therefore, the example (2) falls in the type 1 rather than the mismatch type 3. In Dutch agrammatic speech data I analyzed, there is no example of the mismatch type 3 that poses a question to Distributed Morphology.

3.2. Swedish agrammatic speech data

Basic word order of Swedish is Subject-Verb-Object for both main and subordinate clauses. In main clauses, a verb-second constraint holds. If the clause begins with an adverbial expression, the subject follows the verb, as in (4a).

- (4) a. Sen vakna jag.

Then work up I ‘Then I woke up.’

- b.* Sen jag vakna.

I analyzed a large amount of raw data provided by Ahlsén & Dravins (1990), focusing on the relation between verb position error and verbal morphology error. One (Ms. Garbo) of the patients in Ahlsén & Dravins' (1990) data can put a verb in the correct position when a sentence begins with a subject NP, but she frequently produces matrix sentences with wrong verb position when a sentence begins with an adverb: she frequently produces Adverb-Subject-Verb order (examples (5)-(8)), although she sometimes produces the correct order, Adverb-Verb-Subject. Note that the verbs put in wrong position are correctly inflected. Måansson & Ahlsén (2001) has reported similar cases in which two of four Swedish-speaking agrammatic patients they examined have verb position error in adverbial clauses.

- (5) *Se hon sa.

Then she said ‘Then she said.’

- (6) *Sen han ramla på stolen.

Then he fell on the chair ‘Then he fell on the chair.’

- (7) *Sen han tar en famn säd.

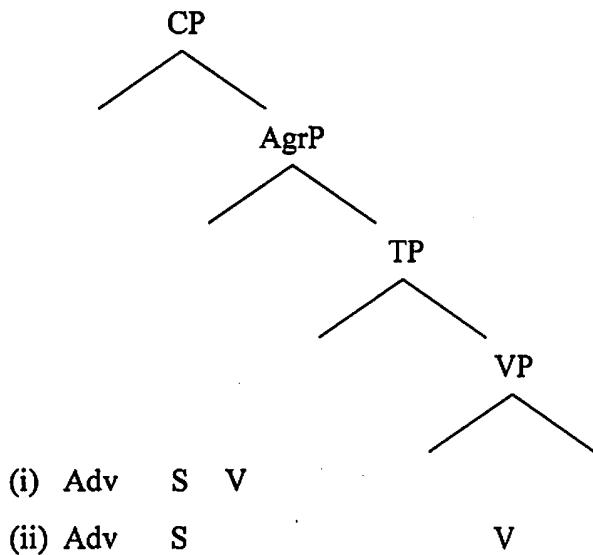
Then he takes an armful corn ‘Then he takes an armful corn.’

- (8) *Sen hon går till skogen.

Then she goes to forest ‘Then she goes to forest.’

These examples are that verb position is incorrect, but verbal morphology is correct. It seems that these examples constitute the mismatch type 3, which questions Distributed Morphology. However, caution is in order, again. It is not clear whether the verbs in the examples are within VP or outside VP since there is no VP-periphery element in the examples.

(9)



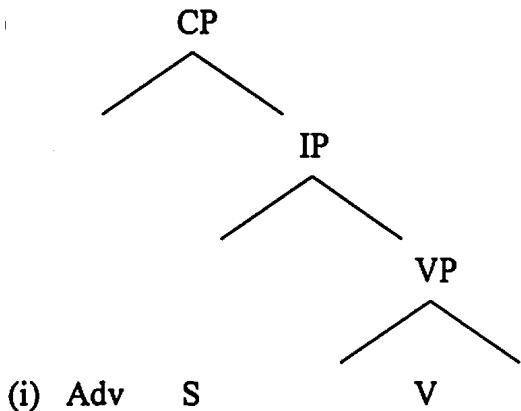
As shown in (9), there are at least two possibilities for the observed wrong word order, Adv-Subject-Verb. If the possibility (ii) is a right form to be analyzed, it is certain that these examples are the mismatch type 3: a verb is inflected in spite of the fact that a verb does not move to functional categories, Agr and T; Distributed Morphology has trouble dealing with such cases. However, as shown in the example (10) that is produced by Ms. Garbo, the possibility (i) rather than the possibility (ii) seems a right form to be analyzed for the examples (5) to (8) on the assumption that Neg phrase dominates VP.

(10) *Sen jag vet inte.

Then I know not ‘Then I do not know.’

Even if these verbs are within VP, as in the possibility (ii) above, it should be noted that there is a possibility that these examples are not counterexamples to Distributed Morphology if we adopt parametric variation on clause structure proposed by Bobaljik & Thráinsson (1998). Swedish verbal morphology is “poor” and its clause structure is set to an unsplit IP:

(11)



In the phrase structure provided by Bobaljik & Thráinsson (1998), even if the verb resides in VP, checking relation between INFL and V(P) can be held since INFL and VP is a local relation (head-complement relation). Whether the mismatch type 3 is truly a counterexample to Distributed Morphology depends on what kinds of clause structure we assume. Thus, an example in which a verb remains within VP and furthermore checking is impossible, but is correctly inflected is the mismatch type 3 that truly questions Distributed Morphology. In Swedish aphasiological data I analyzed, there is no such example.

3.3. English agrammatic speech data

So far, we have not found out the mismatch type 3, which is that a verb is within VP and checking with INFL is impossible, but nevertheless it is correctly inflected. In English agrammatic speech data I will show below, such cases of the mismatch type 3 do exist.

A certain speech production error of English agrammatic aphasics reported by Arabatzis & Edwards (2002) will be a counterexample to Distributed Morphology. They examine eight English-speaking agrammatic patients, and data are collected by elicited speech and narrative speech samples. What is valuable here is an error of verbal morphology in the negative sentences. These agrammatic patients sometimes produce a negative sentence in which the negation morpheme is followed by the bare-stem verb, such as (12)

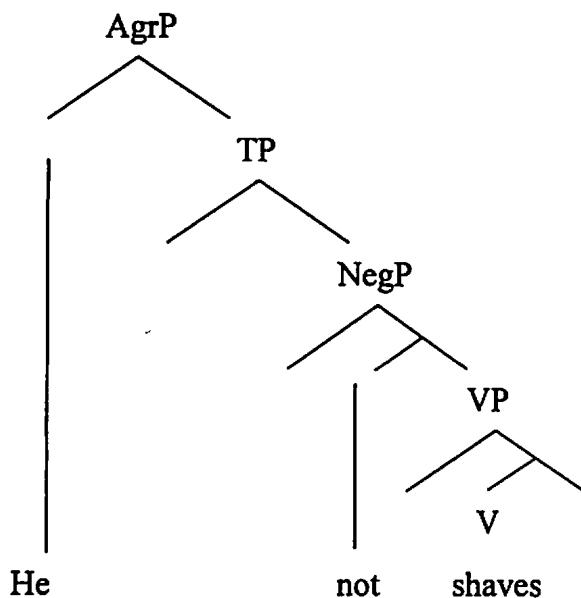
(12) *He not shave.

At the same time, they frequently produce inflected verbs following the negation morpheme in a negative sentence:

(13) *He not shaves.

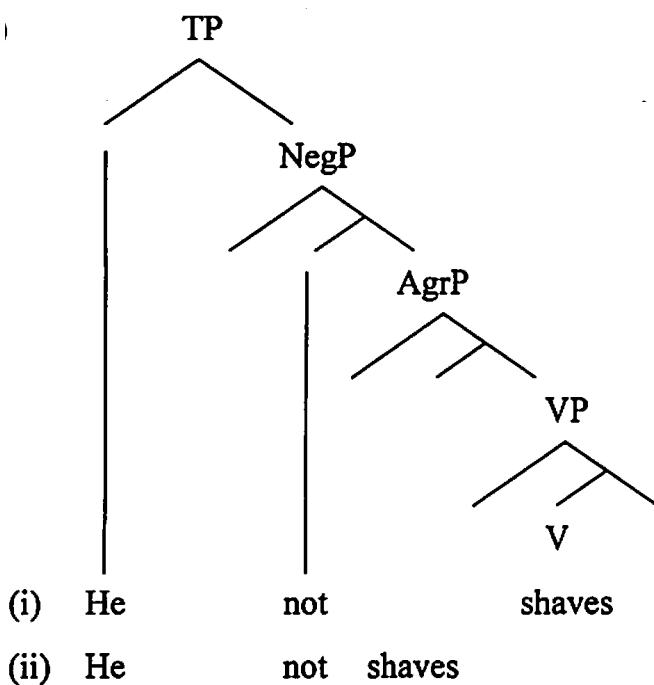
Two patients (Ms. JB, and Ms. DL) produce such negative sentences (13) in half of their trials (7/15). The sentence (13) will be schematized if English clause structure has a split INFL and NegP dominates VP, as in (14) or NegP lies between TP and AgrP, as in (15):

(14)



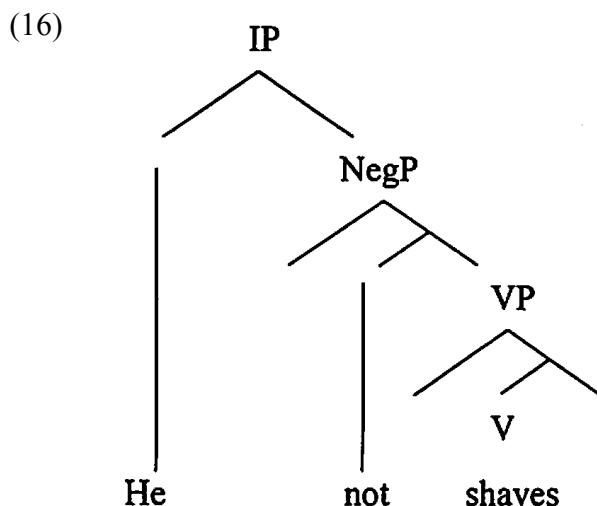
This illustrates that although the verb, *shaves*, does not move out of VP, the verb is inflected.

(15)



If taking (15) as the clause structure, the verb, *shaves*, might raise out of VP and into Agr, but it does not move to T. In either way, the verb does not move to the functional domain, AgrP and TP, but nevertheless it is fully inflected with respect to agreement and tense. This will be problematic to Distributed Morphology.

Even if parametric variation on clause structure (Bobaljik & Thráinsson 1998) is adopted, these cases are still problematic to Distributed Morphology. English is assumed to be set to an unsplit INFL, as in (16):



Since Neg phrase stands between IP and VP, INFL and VP are no more in a local relation. Thus, a verb within VP cannot check inflectional features as it can do in Swedish cases (see (11)). A verb remains within VP and checking is impossible in any event, but it is fully inflected. It is obvious that this is the mismatch type 3, of which Distributed Morphology never gives an account. The example (13) is one that it is predicted not to occur under Distributed Morphology.

3.4. Finnish agrammatic speech data

Basic word order of Finnish is Subject-Verb-Object. Word order is relatively free. Finnish is characterized by a rich system of morphological affixes, and it is assumed that Finnish has V to INFL raising, as shown in (17):

(17) Anna näaki kerran yllättäen sudden.

Anna saw once unexpectedly wolf

‘Once Anna unexpectedly saw a wolf.’ (taken from Rohrbacher 1999: 119)

I analyzed raw data reported by Niemi *et al.* (1990), and found out the following ill-formed example.

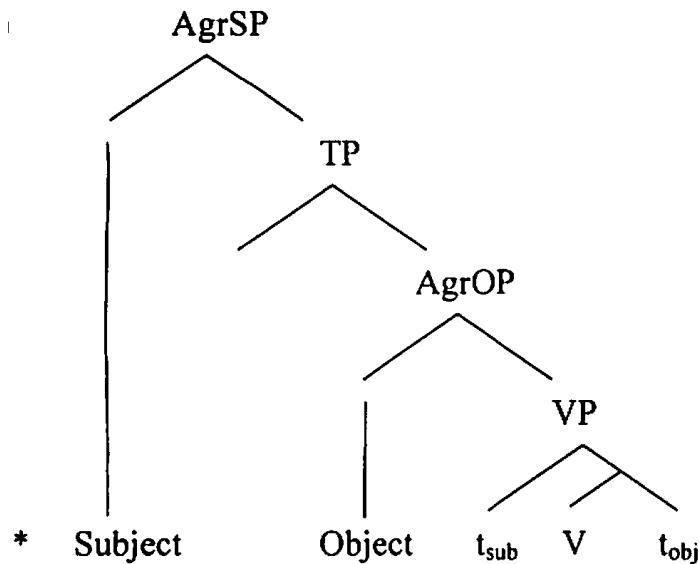
- (18) *ja hän oli [Obj maistiaisia] [Verb viemässä] isoäidille.

and she was freshly-made-bread taking to-Granny

(Correct word order: ja hän oli [Verb viemässä] [Obj maistiaisia] isoäidille)

As stated above, it is not clear that the verb in (18) is within VP or outside VP since there is no element showing VP-periphery in the example, but if the verb is outside VP (i.e., raising to Agr and T), it is difficult to analyze the wrong word order (18) produced by a Finnish agrammatic patient in Finnish phrase structure: if the verb raises to Agr or/and T, there is no position for the shifted object NP which is assumed to be in [Spec, AgrOP] (as long as we do not admit rightward movement).

- (19)



In this way, it is natural to assume that the verb in (18) is within VP. If the verb is within VP, this example is a kind of the mismatch type 3. Even if parametric variation on clause structure proposed by Bobaljik & Thráinsson (1998) is adopted, since Finnish is a split INFL type language, checking between functional categories and the verb within VP is impossible. The example (18) is a case in which the verb is within VP and checking is impossible, but it is correctly inflected. Distributed Morphology cannot handle this case.

3.5. Icelandic agrammatic speech data

Icelandic exhibits V to INFL raising. Thus, adverbs immediately follow the (finite) verb (20). Verbal morphology in Icelandic is rich.

(20) Hann hefur oft komið.

He has frequently come

Magnúsdóttir & Thráinsson (1990) provide a large amount of raw data. Let us examine the following example (21):

(21) *og svo þar tírir hún.

and then there pick-3sg she

‘and then there she picks.’

It is not clear that in the example (21), the fully-inflected verb, *tírir*, moves out of VP or stays within VP. However, if the subject is in [Spec, VP], it is natural to assume that the verb is outside VP. Thus, this is not the mismatch type 3. How is the following example treated?

(22) *og svo maður-inn bara er að.

and then man just be-3sg to

‘and then is the man just.’

(Correct word order: og svo er maður-inn bara að.)

If the adverb, *bara* ‘just’, is adjoined to VP (i.e., it is a VP-periphery element), it should be expected that the fully-inflected verb, *er* ‘be’, remains within VP. If it is the case, the example (22) is the mismatch type 3. Although the verb remains within VP, and checking between INFL (or T and Agr) and the verb within VP is also impossible, but it is correctly inflected. This example will cast a question to Distributed Morphology.

Summarizing section 3, in the first place I have analyzed agrammatic speech data in Dutch (3.1) and Swedish (3.3), and have defended that if we closely scrutinize cases which seem to be the mismatch type 3, these are not the mismatch type 3. As far as Dutch and Swedish data are concerned, it seems that the prediction made by Distributed Morphology is supported. However, looking to agrammatic speech data in other languages, English (3.3),

Finnish (3.4), and Icelandic (3.5), there are some cases where a verb remains within VP, but it is correctly inflected. It is clear that these cases will contradict the prediction made by Distributed Morphology, and cast questions to Distributed Morphology.

4. The relation between “richness” of verbal morphology and verb movement

Before concluding the present paper, I will briefly touch an issue of whether “richness” of verbal morphology triggers verb movement from a perspective of aphasiological data given above.

Some researchers (e.g., Rohrbacher 1999) have argued that there is a causal relationship between verbal morphology and verb movement, which is called the Rich Agreement Hypothesis. In contrast, the Rich Agreement Hypothesis have been considered to be too strong since some languages (e.g., Tromsø dialect of Norwegian and Faroese) are attested where verbal morphology is not rich, but verb movement to functional categories undergoes.

	Verbal Morphology	Movement or In-situ
Pattern 1	Rich	Verb movement
Pattern 2	Poor	Verb movement
Pattern 3	Rich	Verb in-situ
Pattern 4	Poor	Verb in-situ

The Rich Agreement Hypothesis predicts that only the patterns 1 and 4 are attested; on the other hand, the weak version of the Rich Agreement Hypothesis predicts that the pattern 2 in addition to the patterns 1 and 4 will be attested.

As a corollary from the Rich Agreement Hypothesis, the loss of rich agreement entails the loss of verb movement. The Rich Agreement Hypothesis makes a prediction to such a diachronic corollary that there is no language in which although rich agreement is lost, a verb still raises to functional categories. Here I will broadly interpret the loss of rich agreement as “the error of inflection (including tense inflection as well as agreement inflection) in aphasics”, and examine whether the pattern 2 will be attested or not. If the pattern 2 exists, the Rich Agreement Hypothesis is too strong.

The pattern 2 from a viewpoint of aphasiology will be that verbal morphology is incorrect (i.e., the loss of knowledge about verbal morphology), but a verb moves to

functional categories: it amounts to the mismatch type 2 above. Such cases can be found out. As stated in 3.1 (Dutch agrammatic speech data), verbs move to INFL (or T and Agr) and then to C to satisfy a verb-second constraint, but their verbal morphology form is incorrect (i.e., they are nonfinite). Consider the example (23) from Swedish agrammatic speech data.

(23) *Sen så gå jag under den här.

Then so go-infinitive I under this

In (23) the verb moves to INFL (or T and Agr) and to C, but its morphological form is nonfinite. From Icelandic agrammatic speech data, the same kind of data can be collected:

(24) *og svo sjá hann dót.

and then see-infinitive he stuff

(25) *Hér hlaupa hann á næstu mynd.

Here run-infinitive he on next picture

As these examples indicate, verbal morphology of these verbs is incorrect, but verb position of these verbs is correct, which means that these verbs move out of VP and then move to T and Agr, and finally to C.

These examples given above which may be the pattern 2 (the mismatch type 2) will question the Rich Agreement Hypothesis.

5. Concluding remarks

In the present paper I have examined what aphasiological data, especially the mismatch types between verb position and verbal morphology, implies to morphological theory. The agrammatic speech data should be treated carefully. It is well known that individual variation among agrammatic aphasics is so wide. Furthermore, the agrammatic speech data taken up in the present paper is limited in that the great portion of the data is naturalistic speech data: we cannot say whether cases that I found out or I did not find out are sporadic or systematic ones. To confirm what is observed here, some experiments are necessary to conduct. However, even such limited data tentatively imply that there are some cases that will cast a question to Distributed Morphology and the Rich Agreement Hypothesis.

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