Verb raising in American Sign Language[*]

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Abstract

Previous researchers have suggested that the base-generated word order in ASL is Subject-Verb-Object (Fischer, 1987; Liddell, 1980). However, there are some constructions which apparently contradict this assumption. Among these constructions are the phenomena of Verb Sandwich (Fischer and Janis, 1992), Verb Final (Romano, 1991), and Object Raising (Liddell, 1980). All three sentence types contain verbs with an aspectual marker. Unlike its uninflected counterpart, an inflected verb in these constructions appears in the sentence-final position, which is not assumed to be the basic position for ASL verbs.

I propose a unified account for these three ASL constructions and consider its theoretical implications for the theory of verbal morphology. I extend the idea of the Movement Analysis of Verb Sandwich, proposed in Fischer and Janis (1992). Based on the Minimalist approach proposed in Chomsky (1995), I argue that the derivations of all three sentence patterns involve overt verb raising to Infl. The verb movement to Infl occurs to save the otherwise stranded [asp] affix, even though the verb itself does not have motivation to raise overtly. Hence, this verb raising is a syntactic operation driven by Enlightened Self Interest (Lasnik, 1995a,b). In our discussion, it is shown that Chomsky's (1995) Checking Theory faces empirical problems in accounting for the ASL phenomena in question. I will present an alternative analysis, which is crucially based on a proposal of Lasnik (1995c) that regular verbs are selected from the lexicon uninflected. The Object Raising is analyzed as an instance of Holmberg's generalization (Branigan, 1992), which states that overt object shift is possible only when the verb is overtly raised out of VP.

1. Introduction

Determining the basic word order in ASL (American Sign Language) is one of the major issues in the study of ASL, since the language seemingly allows free word order. Based on previous research, it has been assumed that the base-generated word

order in ASL is Subject-Verb-Object (Fischer, 1987; Liddell, 1980). However, there are some constructions which apparently contradict this conclusion.

Among these constructions, I consider the phenomena of Verb Sandwich (Fischer and Janis, 1992), Verb Final (originally observed in Romano, 1991) and Object Raising (originally discussed in Liddell, 1980). This paper is an attempt to provide a unified analysis of these constructions based on the Movement Analysis of Verb Sandwich (Fischer and Janis, 1992). I will show that the Movement Analysis can be extended to account for sentence constructions other than Verb Sandwich. I will base our argument on the framework of the Minimalist Program (Chomsky, 1995). Our analysis shows that the characteristics of these three apparently unrelated phenomena are captured by the assumption of overt verb raising. In our discussion, I will point out that Chomsky's (1995) Checking Theory faces empirical problems in accounting for the phenomena in question. I will present an alternative analysis, which is crucially based on the theory of verbal morphology proposed in Lasnik (1995c). In addition to verb raising, Object Raising sentences seem to involve an additional syntactic operation, overt object shift. I treat this construction as support for Holmberg's Generalization (as cited in Branigan, 1992). This paper assumes that functional categories in ASL are head-final, following Romano (1991). Because this assumption is not uncontroversial, I will discuss the evidence for alternative possibilities in Section 6.

I assume that ASL is a natural human language, and that the principles of UG should hold in the grammar of ASL just as it does in that of spoken languages. Hence, our null hypothesis is that the structure of Infl in ASL is the same to that has been proposed in previous research of other natural languages such as English, French, Irish, Japanese, etc. Any language-specific proposal to explain certain constructions (unless the proposal can be crucially attributed to a difference in the lexical information) should be considered only when the null hypothesis cannot provide an explanation of the derivations. In this way, I will attempt to minimize language-specific stipulations and show that the three sentence types in ASL illustrated above can be derived without significant changes to the assumptions developed in Chomsky (1995).

2. Data

I assume that ASL verbs do not carry any inflectional markers for tense, person, or gender (but see the discussion on the class of Agreement Verbs in the appendix). For example, the verb *EAT* is always signed the same way, regardless of the time when the action takes place. A verb can, however, carry an aspectual marker such as one for unrealized action or continuous action. In this paper, I assume that these 'aspectual' markers ([asp]) project their own phrase (AspP). Hence, Infl in ASL is assumed to consist of AgrSP, TP, AspP, and AgrOP.

The continuous aspectual marker (indicated as [asp:cont] in examples) can be seen as repeated hand movement. For example, *EAT[asp:cont]* is signed with repeated hand movements (shorter and quicker) toward the signer's mouth.

EAT[asp:cont] is often translated as 'to keep eating', 'continuously eating', or 'eating for a long time'. The same aspect marker is called 'durative aspect' in previous literature (Liddell, 1980). The unrealized aspectual marker (indicated as [asp: unrealized] in examples) can be seen as a sudden stop of the hand movement as the signer begins to sign the verb. For example, *EAT[asp: unrealized]* is signed with the hand moving toward the face of the signer, but abruptly stopped before the hand reaches the region around the mouth of the signer. This verb is translated as 'to be about to eat'.

As seen in the following sections, aspectual markers affect the word order in ASL. Though it is not clear that all aspectual markers cause changes in word-order, I will consider Continuous Activity [asp:cont] and Unrealized Activity [asp:unrealized] as two aspect markers which are relevant to the non-traditional word order.[1]

2.1. Verb Sandwich

Among the ASL sentences elicited in their study, Fischer and Janis (1992) observed the sentence construction illustrated in (1) and (2), which was consistently found in native signers' use of ASL.

(1) STUDENT NAME S-A-L-L-Y TYPE HER TERM PAPER TYPE[asp:cont]
     'A student whose name is Sally was typing and typing her term paper.'
(2) S-A-L-L-Y THERE HMM TYPE T-E-R-M[2]
     PAPER TYPE[asp:unrealized].
     [look up] ROOMMATE SHOW-UP.
     'As Sally [umm] (was about to) type her term paper, her roommate turns up.'

In both (1) and (2), there are two instances of the same verb (*TYPE*) in a single sentence. It is not the case that one of the verbs is the exact copy of the other; only one verb (the second one) carries the [asp] marker. Fischer and Janis call this construction Verb Sandwich, since in those sentences, the object NP is 'sandwiched' between two verbs. In particular, Sandwich sentences such as (1) and (2), include verbs with aspect markers. I call this Sandwich construction 'Aspectual Sandwich'.[3]

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[1] For detailed discussion of types of Aspect, see Klima and Bellugi (1979).

[2] The transcription 'T-E-R-M' indicates that the word was finger-spelled. It should not affect the grammaticality judgment whether certain words are finger-spelled or signed.

[3] The Aspectual Sandwich construction contrasts with the other type of Sandwich constructions discussed by Fischer and Janis (1992), which I rename 'Lexical Sandwich'. Examples are provided below.
   (i) Lexical Sandwich
       H-A-R-O-L-D SWEEP[shape cl:B] FLOOR
       USE-BROOM-AROUND[handle cl:S-on-S:plural location]
       'Harold sweeps up the floor [with a broom]' (Fischer and Janis, 1992)
cl refers to 'classifier', a handshape which shows the shape of an object/tool which is involved with the action described by the verb. For example, 'cl:B', 'cl:S-on-S' indicate the handshapes representing the broom and the handshape of a person holding a bloom, respectively. 'Plural location' indicates that the signer repeated the sweeping hand movement in several different locations in front of her body. In a

Fischer and Janis proposed two different accounts for Verb Sandwich. One is the Functional Account, which states that an additional copy of the verb is generated when there are too many stranded arguments for one verb to license. However, this account fails to explain why the Verb Sandwich construction has fixed order. For example, in the Aspectual Sandwich sentences, the bare verb always appears first and its inflected counterpart appears in the sentence-final position. If a verb can be generated simply to share the load, the verb should be able to be inserted in any sentence position. Secondly, the functional account does not explain the existence of other types of ASL sentences, in which a single verb carries the same aspectual marker, such as the Verb Final construction as shown below.

(3) S-H-E R-A-D-I-O LISTEN[asp:cont]
    'She was continuously listening to the radio.' (Romano, 1991)

The other account proposed by Fischer and Janis is the Movement Account. They assume that a verb moves to Agr (head-initial) and then to Asp (head-final) to license a potentially stranded Aspect morpheme. A trace of the verb is phonetically realized as a resumptive verb. This is the analysis I will develop further in this paper.[4]

In the following sections, I will illustrate two other sentence constructions which will be considered in this study. They both contain a verb with the [asp] marker.

2.2. Verb Final

The following sentence in (4), which was judged to be grammatical by native signers, cannot be explained by the Functional Account in Fischer and Janis (1992).

Lexical Sandwich sentence, the second verb *USE-BROOM-AROUND* does not show the [asp] marker. Additional lexical items are incorporated into the second verb: 'BROOM' (seen as the 'S-on-S' handshape) and different locations where the sweeping occurred. Fischer and Janis's Movement Account can only explain the derivation of the Aspectual Sandwich, though. The account does not readily provide for the derivation of Lexical Sandwich, since the authors do not discuss the position in which instrument or locative morphemes are located.

Aspectual Sandwich involves inflectional morphology, while its lexical counterpart seems to be a result of some sort of lexical operation. This can be seen on the second verb in the Lexical Sandwich sentence, which contains extra lexical items such as instrument or location. This observation naturally leads us to the assumption that Aspectual and Lexical Sandwich are not derived in exactly the same way. I will follow the assumption and mainly consider Aspectual Verb Sandwich. For an analysis of the Lexical Sandwich, see Matsuoka (1996b).

[4] This verb raising proposed in our analysis is rightward movement and thus is not consistent with Kayne's argument that "any movement of a phrase upward to a c-commanding position must ... be leftward" (Kayne, 1994). Kayne's proposal is based on the argument that UG imposes Spec-Head-Complement order for any natural language. Unlike Kayne, I assume that UG allows different options of directionality for components of a maximal category, even within a single language (Romano, 1991). While Kayne's argument might hold with languages which strictly observe the Spec-Head-Complement order, it should not apply to languages such as ASL.

(4) S-H-E R-A-D-I-O LISTEN[asp:cont]
    'She was continuously listening to the radio.' (Romano, 1991)

In their analysis of Verb Sandwich, Fischer and Janis (1992) argued that a verb needs a copy to split the burden of heavy 'inflection'. However, there is no copy of the verb in (4).[5] Sentence (4) shows that ASL verbs appear in the sentence-final position when they carry an aspectual marker. The same observation holds for Verb Sandwich as well. This word order is ungrammatical when the verb does not carry an aspectual marker, as shown in (5) below.

(5) *GIRL TOMATO EAT 'The girl eats a tomato'

The third type of ASL sentence, introduced in the next section, confirms this generalization. This sentence type also seems to involve an additional syntactic operation. I will call this construction Object Raising.

2.3. Object Raising

Objects in ASL can appear in the sentence-initial position only when they are clearly marked by the topic facial marker. The topic facial marker in (6b) (indicated by '___t' above the topicalized word) marks the object which is moved from its original position.

(6) a. *PURSE WOMAN LOSE 'The woman loses the purse.'

          ____t
    b. PURSE WOMAN LOSE 'The woman loses the purse.' (Liddell, 1980)

However, Liddell (1980) observed that when a verb carries an aspectual marker ('inflected verb form' in his terms), its object can be in the sentence-initial position without being marked by the topic facial marker.

(7) TOMATO GIRL EAT[I:durative aspect]
    'The girl eats tomatoes for a long time'

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[5] The following construction is introduced as a grammatical sentence in Romano (1991) and Aarons et al. (1992). In (i), the inflected verb is placed in the same position as its uninflected counterpart.
   (i) S-H-E LISTEN[asp:cont] RADIO (Romano, 1991)
However, it is observed by a number of ASL researchers (D. Lillo-Martin, K. Petronio, W. Janis, p.c.) that the grammaticality judgment for such sentences varies among signers. On the other hand, the other word order, such as (ii), is accepted as grammatical (and strongly preferred) by almost all native informants.
   (ii) S-H-E RADIO LISTEN[asp:cont] (ibid.)
Based on these observations, I assume that the word order indicated in (i) could be a result of influence from English word order. I do not consider sentence type (i) as a grammatical option in the ASL grammar that I investigate in this paper.

He notes, "... if the inflected verb form is used, the sentence is most naturally signed with the object of the verb in initial position ... . They can appear in initial position without any topic marking (including no lengthening of the duration of the sign)" (Liddell, 1980: 103). The 'inflected verb form' in Liddell's term describes a verb with an aspectual marker. Since Liddell did not provide an example, I constructed the sentence in (7), which illustrates the phenomenon described above. This type of sentence construction is frequently observed in native ASL conversations (K. Petronio, p.c.)

Notice that the same word order with an uninflected verb (which does not carry any aspectual feature visible as an additional movement to its basic form) is ungrammatical as shown in (6a). It is particularly interesting that a verb only appears in the sentence-final position when it carries the [asp] marker. In addition, the object appears in the sentence-initial position without being marked by the topic-marker.

According to Liddell's analysis, the object moves into the sentence-initial position, leaving the main verb in the sentence-final position. Liddell conjectures that movement of the object occurs because of the 'Heaviness' of the inflected verb. However, in his analysis, it is not explained how the heaviness of the verb is related to the availability of this object-movement.

3. Checking theory and its empirical problems

The three constructions presented in the previous section have been investigated separately in previous literature. However, the three sentence types show a striking similarity in that a verb with an aspectual marker appears in the sentence-final position. Based on the Minimalist Approach in Chomsky (1995), I argue that the derivations of these sentences involve overt verb raising to Infl.

The Minimalist Program can be outlined as follows. A language consists of a lexicon and a computational system. The computational system arbitrarily chooses items from the lexicon and forms a derivation, following X'-theory. Each derivation determines a linguistic expression, which contains a pair of representations (PF and LF). Each representation must meet the interface conditions such as the Case Filter.

A representation at the level of PF/LF may consist only of only legitimate PF/LF objects. Legitimate objects are constituents of a representation licensed by various interface conditions (principles such as Full Interpretation). If a representation satisfies all relevant interface conditions, the derivation that formed the representation converges at PF/LF; otherwise, it crashes. A verb is arbitrarily selected from the lexicon with a particular choice of V-features and a Tense feature, which can be expressed by certain morphemes. For example, *eat, ate, eating* are listed as independent lexical items. The inflectional categories have V-features as well. At some point in the derivation, the verb adjoins to the heads of inflectional categories in order to check its V-features. If the V-features of the verb and the inflectional categories conflict, the derivation crashes.

Nouns also need to be licensed as legitimate objects at some point in the derivation. This is done via Case-checking by functional heads. Case-checking of NP is

assumed to be done solely by Spec-Head agreement. Thus, subject NP raises to the Spec of AgrSP. T raises to AgrS and the combined head (T+AgrS) checks Case of the subject NP. The object NP raises to the Spec of AgrOP, where its Case is checked by AgrO+V. That is, the same inflectional categories check both the verb (checking of V-features via adjunction) and the NP (checking of D-feature via Spec-Head agreement). In this way, Infl ensures that the NPs and the verb are properly paired in the representation. The V/D-features disappear when they are checked. In English-type languages, Infl is assumed to have weak V-features. Since the weak V-features are not visible at PF, overt verb-raising is not required. When the verb does not have to raise overtly, it raises in the LF component, since that is more economical (The Principle of Procrastination). Following Romano (1991), I assume that functional categories in ASL are head-final. On the other hand, lexical categories in ASL (such as VP) are assumed to be head-initial, which results in the surface word order. $[_{CP}[_{IP}[_{VP}$ Subject $[_{V'}$ Verb Object]]]]. (For the position of the subject in ASL, see discussion in Section 6).

It might be possible to make the following assumptions: the [asp] feature is a part of the V-features of Infl. When the [asp] feature is included among its V-features, Infl becomes strong. The strong agreement forces overt verb raising to Infl. When the verb adjoins to functional heads, the strong features are checked off. Otherwise, the features will be visible at PF, which forces the derivation to crash. To save the derivation, the verb overtly raises to the functional categories and hence appears in the sentence-final position.

I assume the Copy Theory of Movement (Chomsky, 1995). This theory states that a trace is a copy of the moved element, which is deleted at the PF component. The Verb Sandwich construction indicates that the PF-deletion rule is optional in ASL, which allows a copy of the verb to remain in PF representation. (8) is a summary of a derivation based on the assumptions made so far.

(8) Original array of words: SALLY TYPE[asp] PAPER
$$\downarrow$$
Overt V-raising: *SALLY TYPE[asp] PAPER TYPE[asp]
$$\downarrow$$
Optional PF Deletion #1: SALLY *e* PAPER TYPE[asp]
Optional PF Deletion #2: *SALLY TYPE[asp] PAPER *e*

The analysis above based on Inflected Verb Selection does not provide the derivation of Verb Sandwich. According to the derivation in (8), the sentence in (9) below will incorrectly be predicted to be grammatical. At the same time, I cannot derive the correct Verb Sandwich sentence shown in (10).

(9)   *SALLY TYPE[asp] PAPER TYPE[asp]
(10) SALLY TYPE PAPER TYPE[asp]

The Verb Sandwich and the Verb Final sentences seem to call for an alternative theory of verbal morphology. I will show that Verb Sandwich, Verb Final, and

Object Raising give empirical support for Lasnik's (1995c) theory of verbal morphology.

4. Uninflected verb selection and affixal functional heads

Lasnik (1995c) pointed out that Chomsky's (1995) Checking Theory faces a problem in explaining the grammaticality of sentences such as (11)–(12). These sentences are classic examples of VP-ellipsis.

(11) John left and Bill will, too.
   (= John *left* and Bill will *leave*, too.)
(12) I am climbing and you will, too.
   (= I am *climbing* and you will *climb*, too.) (Lasnik, 1995c)

The standard analysis assumes that VP Ellipsis is an operation which deletes the second VP under identity with the first VP. However, under Chomsky's (1995) assumptions, the two VPs in (11) and (12) are not identical at any level of derivation:[6] yet both are grammatical.

Based on data such as (11)–(12), Lasnik conjectured that non-auxiliary verbs in English are selected from the lexicon in their bare form; i.e., with no V-features to be checked. He further assumed that the English Infl system can be either affixal or a bundle of features. When Infl is a bundle of strong features, it induces raising of auxiliary verbs such as *have* or *be*, which are selected fully inflected. When main verbs are selected instead, there will be no V-raising, since main verbs are assumed to have no V-feature to be licensed. In that case, the derivation crashes since features of the Infl do not get any V-features to check.

When Infl is affixal, on the other hand, the main verb and Infl are merged by a PF operation, yielding the inflected form of the verb. Since PF merge does not involve feature-checking, it is not problematic that main verbs do not carry any V-features. If the PF-merging does not apply, the affix will be stranded at the PF level, as shown below.

(13) *John 'ed' laugh
   (for the meaning equivalent to 'John laughed')

The sentence (13) violates the Stranded Affix Constraint, shown in (14) below:

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[6] One might conjecture that different features of two verbs (Tense, etc.) can be ignored when the VP ellipsis applies. The following example shows that is not the case (Lasnik, 1995c).
   (i) a. John will be here and Bill will, too
      (= John will *be* here and Bill will *be*, too)
   b. *John is here and Bill will, too
      (= John *is* here and Bill will *be*, too)
Examples in (i) imply that VP ellipsis applies under identity and that the Identity Constraint is sensitive to the tense feature on the verb.

(14) A morphologically realized affix must be a syntactic dependent of a morphologically realized category at surface structure. (Lasnik, 1981: 135)

A potentially stranded affix in English can be saved by a PF merge to an adjacent verb. If the verb is not adjacent to the affix, the PF merge is not possible. In that case, Do-support saves the stranded affix.

(15) a. *John 'ed_ not leave
   b. John did not leave

Verb Sandwich empirically supports Lasnik's hypothesis. Note that the first verb in Verb Sandwich sentences is always uninflected.

(16) a. SALLY TYPE PAPER TYPE[asp]
   b. *SALLY TYPE[asp] PAPER TYPE[asp]

I assume that the [asp] is an inflectional head, which projects AspP. Suppose that the [asp] head in ASL is an affix. The affix needs to be syntactically dependent on a verb at the overt level. Otherwise, the derivation will contain a stranded affix and thus it will be excluded. The verb will move to the [asp] head at the overt level, so the derivation will not contain a stranded affix.[7]

This analysis of verb raising is not compatible with the principle of *Greed* (self-serving Last Resort) in Chomsky (1995). Greed states that an operation can be applied to an item X only when the operation is necessary to satisfy the morphological properties of X. In the analysis discussed here, a verb is raised to Infl to save the otherwise stranded affix in AspP. Note that the verb itself does not have any reason to raise at the overt level. There is no morphological property of the verb which must be satisfied at the overt level. Hence, the verb movement cannot be motivated by Greed.

Rather, this verb raising operation is motivated by a slightly weakened version of Greed which is proposed by Lasnik (1995a,b).

(17) Enlightened Self Interest: Movement of α to β must be for the satisfaction of formal requirements of α or β. (Lasnik, 1995b: 9)

The movement operation of a verb (α in the definition) to the [asp] head (β in the definition) is applied to satisfy the morphological requirement of the [asp] morpheme. This movement satisfies Enlightened Self Interest, but not Greed. The affixal [asp] and the verb are raised and then merged at PF, as shown in (18).

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[7] Note that this verb movement is not available in English.
   (i) a. *John ed not leave
   b. *John left not
   c. John did not leave
PF merge and do-insertion are the only options allowed to non-auxiliary verbs in English. On the other hand, overt verb raising is allowed in French (Pollock, 1989).

(18)   IP
             |
         AspP   Merge
        /   \   ___
      VP   asp affix   V
     / \   ↑
       V'
      / \
  copyV Object
     |
     |_____|

Verb raising
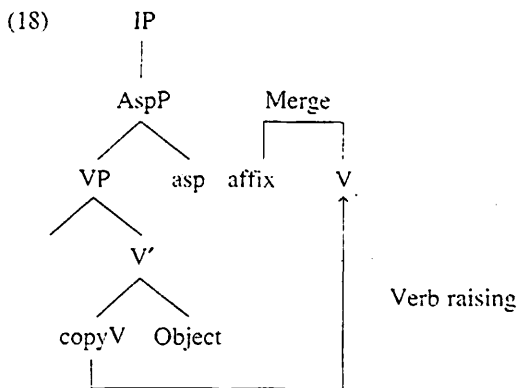
When the verb is raised. it leaves a copy (a trace with phonetic content) in its original position. As illustrated in (19) below. Verb Final is derived when the copy of the verb in its original position is deleted at PF.

(19) SALLY TYPE PAPER TYPE[asp]
        ↓   PF deletion of the copy in the original position
     SALLY PAPER TYPE[asp]

To summarize. Verb Sandwich and Verb Final are derived as follows:

(20) Original array of words: SALLY TYPE PAPER   [asp]
                ↓
     Overt V-raising: SALLY TYPE PAPER TYPE   [asp]
                ↓
     PF Merging: SALLY TYPE PAPER TYPE[asp]
                ↓
     Optional PF Deletion #1: SALLY e PAPER TYPE[asp]

The derivation correctly derives both Verb Final and Verb Sandwich.[8]

In the next section. I consider the derivation of Object Raising in detail. The derivation of Object Raising involves an overt syntactic operation in addition to verb raising. This sentence construction seems to be an instance of overt object shift. which has been observed in other languages such as Swedish.

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[8] An alternative analysis of the overt verb raising in ASL is to assume that the head of the Aspect Phrase consists of two parts: an empty head. which is a bundle of features. and the affixal head. which obeys the Stranded Affix Constraint. Suppose that ASL verbs can be selected with a phonetically null and strong V-feature. which must be overtly checked by the empty Aspect head. To satisfy its own requirement. the verb raises to AspP. When the verb adjoins to the empty head. it is close enough to the [asp] affix to undergo PF merge. Hence. the inflected form of the verb is derived. This verb movement is motivated by Greed (Chomsky. 1995).

5. Overt object shift in ASL

As shown earlier. the object in ASL can appear in the sentence-initial position only when it is marked with the topicalized marker. However. when a verb carries an aspectual marker. the Object-Subject-Verb word order is possible without the topicalized marker on the object. This indicates that those sentences are not results of topicalization.

(6) a. *PURSE WOMAN LOSE 'The woman loses the purse.'

        _____t
     b. PURSE WOMAN LOSE 'The woman loses the purse.' (Liddell. 1980)
(7) TOMATO GIRL EAT[I:durative aspect]
     'The girl eats tomatoes for a long time'

I assume the VP-Internal Subject Hypothesis proposed in Kuroda (1988) and Koopman and Sportiche (1991). Suppose that the object in (21) is raised to Spec of AgrOP overtly. while the subject will not raise until LF. This would seem to generate object shift sentences such as those in (6)–(7).

(21) [$_{AgroP}$ Object$_i$ [$_{VP}$ Subject Verb t_i]]

However. the derivation in (21) is ruled out for the following reason. I adopt Chomsky's (1995) assumption that movement must take the shortest possible path. For example. A-movement cannot proceed in such a way as to skip a closer A-position landing site. In this example. the movement of the object would skip a closer landing site (namely. Spec of VP). Since this movement is not the shortest. it will violate the constraint of Shortest Movement.

Crucially. the overt object shift in ASL. without a topic marker. is possible only when the verb carries the [asp] marker. In such examples. the verb is raised to Asp overtly. The object shift in ASL such as (6b) and (7) shows a striking similarity to Holmberg's examples in Swedish (Branigan. 1992). *läste* is the verb ('read') and *den* is the object pronoun.

(22) Swedish:
        a. Varför läste$_2$ studenterna den$_1$ inte alla e_2 t_1
           Why read the students it not all
        b. *Varför har studenteerna den$_1$ inte alla läst t_1
           Why have the students it not all read

     ASL:
        c. TOMATO$_1$ GIRL EAT[asp] t_1
        d. *TOMATO$_1$ GIRL EAT t_1

Holmberg's Generalization states that overt object shift is possible only when the verb is raised out of VP. The generalization correctly describes the ASL example if

I assume the verb raising analysis proposed in this paper. The verb (*EAT*) in (22c) moves out of VP, which makes the object shift possible at the overt level.

However, the generalization does not seem compatible with the constraint of Shortest Movement. Whether the verb is out of VP or not, raising of the object would skip the closest landing site. All examples in (22) will then be incorrectly excluded.

Addressing this problem, Chomsky (1995) suggested that when a verb moves into an Agr position, as shown in (23) below, it makes Spec of AgrP and Spec of VP equally close to the complement of V. (See Chomsky, 1995, for discussion of checking domain and the precise formulation of *Equidistance*.)

(23)
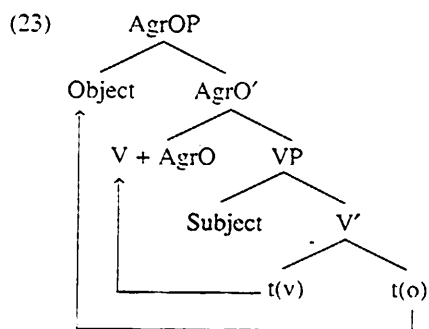
The Equidistance Hypothesis correctly accounts for the observation that overt object shift is possible only when the verb is raised overtly.
Overt Raising is derived as illustrated in (24). I assume that, unlike its counterpart in English, the overt raising of the subject in ASL is a stylistic rule (see Section 6 for more discussion).

(24)
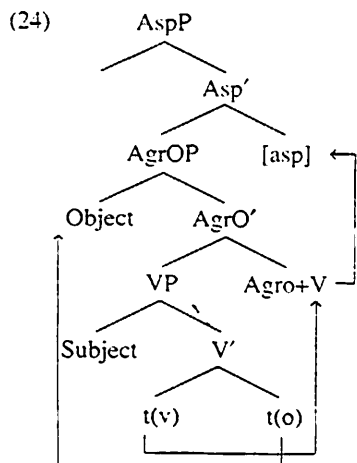
The verb is raised to AspP to prevent the [asp] affix from being stranded. I crucially assume that the [asp] head is located above AgrOP. As a head-to-head movement, the verb is raised to the AgrO head on its way to the [asp] head, and hence the derivation contains only the shortest movement at each step.[9] Since the verb is adjoined to the AgrO head, Spec of AgrOP is no further than Spec of VP for raising the object. Therefore, the object can be raised overtly, skipping Spec of VP.[10]

In an Object Raising sentence, the copy of the verb in the original position is deleted at PF. One might wonder if the same derivation is possible in which the copy of the verb is not deleted. The result is a Sandwich-like sentence with overt object shift such as the one in (25).

(25) TERM PAPER SALLY TYPE *t* TYPE[asp]

Our informant rejected the sentence (25), even though our theory predicts that the sentence is grammatical.

It seems that (25) is rejected by some surface-level constraint. ASL allows doubled Wh-phrases in one sentence (Lillo-Martin, 1990; Petronio, 1993; Aarons et al., 1992). (26) and (27) below show that it is possible in ASL that more than one copy of a Wh-phrase appear in one sentence (in the original position and either the sentence-final or sentence-initial position). '___whq' indicates the scope of the non-manual marker for the Wh-question.

                             whq
(26) WHAT JOHN BUY WHAT 'What did John buy?'

                          whq
(27) WHO BUY C-A-R WHO 'Who bought a car?' (Petronio, 1993)

However, the following sentences are not allowed (D. Lillo-Martin, p.c.)

                            whq
(28) a. *JOHN BUY WHAT WHAT 'What did John buy?'

                        whq
    b. *WHO WHO BUY CAR 'Who bought a car?'

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[9] This analysis is based on the assumption that Enlightened Self Interest is a global constraint. Note that in the derivation illustrated in (24), the first part of verb raising (V to AgrO) does not save the stranded [asp] affix. If Enlightened Self Interest is a local constraint, this movement would not be allowed.

[10] Unlike verbs in ASL, an object NP does not have the option of leaving an overt copy in its original position.
   (i) *TOMATO GIRL TOMATO EAT[asp]
As seen in examples of Verb Sandwich, copies of moved items do not have to be deleted in ASL. But since (i) is not allowed, I assume that A-movement does not leave a trace.

There seems to be a surface constraint in ASL which prevents two phonetically identical items from being side-by-side. (25) seems to be blocked by this constraint.

I presented the verb raising analysis based on Romano's (1991) claim that functional categories in ASL are head-final.[11] Following our null hypothesis, I assumed that AgrS is located above Tense. However, Petronio (1993) argued that functional categories are head-initial, and TP in ASL is located above AgrSP, based on ASL modal data. In the following section, I will consider Petronio's analysis and propose an alternative analysis of ASL modals.

6. Modals in ASL

Modals in ASL seem to share the same distribution pattern as their English equivalents, as seen in (29). However, (30) is also allowed as a semantic equivalent to (29) ('hn' shows the scope of non-manual sign 'head nod', which typically accompanies positive modals such as *CAN, MUST, SHOULD*).

<u>   hn</u>
(29) JAMIE SHOULD WIN 'Jamie should win.' (Petronio, 1993)

<u>   hn</u>
(30) JAMIE WIN SHOULD 'Jamie should win.' (Petronio, 1993)

If I assume that the modal is the head of TP, (29) will be an immediate problem for our hypothesis that functional categories in ASL are head-final. If the ASL modal is the head of TP as proposed in Pollock (1989), (29) seems to indicate that functional categories in ASL are head-initial. I propose an alternative analysis of modals in ASL, which is consistent with Romano's (1991) claim that functional categories in ASL are head-final.

Suppose that the modal in ASL belongs to a certain class of verbs (Padden, 1988). I assume that it is selected as a complement of Tense. It projects Modal Verb Phrase = MVP. Being a lexical category, its projection is head-initial. (It is irrelevant to current discussion if the AgrOP is present or not in the following representation.)

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[11] The assumption that Infl in ASL is head-final could lead us to the following problem. Suppose that PF merge occurs only between items which are adjacent to each other; otherwise, I will not be able to rule out an English example such as *John not left. If that is the case, I will not be able to generate the basic word order in ASL such as (i). Since the object NP intervenes between the verb and Infl before Spell-out, the verb and Infl affix cannot be merged at PF.

(i) GIRL *EAT* TOMATO *Infl-affix*

  |_____|

Without discussion, I assume that functional heads other than [asp] are featural (i.e. a bundle of features) rather than affixal.

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(31) AgrSP
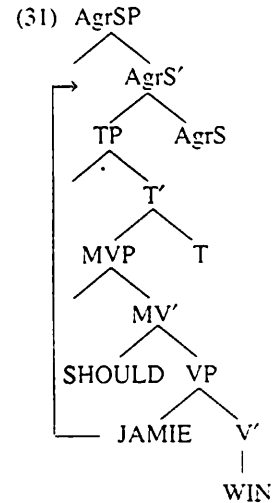
The following example can be interpreted as an example in which ASL modals behave in a parallel way as verbs do (cf. Petronio, 1993). They can 'double' as shown in (32) to add an emphatic nuance to the sentence, as implied in the capitalized *SHOULD* in the English translation.

<u>   hn</u>
(32) PHIL SHOULD BUY COMPUTER SHOULD
     'Phil SHOULD buy a computer.' (Petronio, 1993)

Suppose that the head of TP contains an emphatic affix, which does not have phonetic content.[12] The modal verb *SHOULD* is raised to the head to prevent the

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[12] As noted by Petronio (1993) and Petronio and Lillo-Martin (1997), the wh-phrase in ASL also doubles.

<u>   whq</u>
(i) WHAT JOHN BUY WHAT 'What did John buy?' (Petronio and Lillo-Martin, 1997)
Petronio (1993) proposed a unified account for doubled modal and wh-phrases. One would immediately notice a possible theoretical problem that modals and verbs are both heads, while a wh-phrase is an XP category. Petronio argued that the moved item is a focused head, not an XP. Note that in the following examples, the final item in the wh-double cannot be a phrase.

(i) a. <u>   whq</u>
    WHICH COMPUTER JOHN BUY WHICH
    'Which computer did John buy?'
   b. <u>   whq</u>
    *WHICH COMPUTER JOHN BUY WHICH COMPUTER
    'Which computer did John buy?' (Petronio and Lillo-Martin, 1997)
Petronio's analysis relates Modal Doubling sentences to the derivation of multiple Wh-movement in ASL. The analysis presented in the main text suggests an alternative analysis which relates the derivations of Verb Sandwich to Modal Doubling sentences. Since our analysis of Modal is a tentative one, I simply draw attention to the issue at this point.

emphatic affix from being stranded. This movement is an instance of the overt verb raising discussed in earlier sections. If a TP includes the null affix, the verb is raised to the sentence-final position. The verb leaves a copy in its original position. When the copy of the modal in its original position is deleted, (30) will result. Otherwise, (32) will be derived.[13] If there is no null emphatic affix generated inside TP, the modal does not have to raise overtly.

Note that Verb Sandwich sentences do not have this emphatic implication. This fact suggests that the emphatic affix contains a feature which is shared only by modal verbs. I will not investigate the nature of this feature any further here.

Petronio (1993) argues that (33) implies that TP is located above AgrSP in ASL.[14]

```
               hn
```
(33) SHOULD JAMIE WIN 'Jamie should win.'

```
               hn
```
(34) JAMIE SHOULD WIN 'Jamie should win.' (Petronio, 1993)

Based on the ordering of modals and verbal agreement in ASL, Petronio assumed the ordering of phrases with Infl in ASL to be TP-AgrSP-AgrOP (1993: 85–86). The subject has a choice between moving to Spec of AgrSP (yielding (33)) or optionally undergoing additional movement to Spec of TP (yielding (34)). Petronio argued that the subject 'receives' (her terminology) Nominative Case by two different procedures according to the choice. (35) is a simplified representation which illustrates Petronio's argument. The subject is assumed to be raised at the overt level (at 'SS' in Petronio's terminology).

(35)

However, if I assume the VP-Internal subject hypothesis, the TP-AgrSP ordering is not necessary to derive different orderings of the modals. Earlier I assumed that overt subject-raising in ASL is a stylistic operation.[15] That is, raising of the subject can occur either at the overt level or at LF. When the subject is raised to Spec of AgrSP at the overt level, the Subject-Modal-Verb word order is obtained. Otherwise, the Modal-Subject-Verb order is obtained. (Note that it is not relevant if the modal is the head of TP or MVP for this argument.)

(36) a. [AgrSP [TP/MVP SHOULD [VP PHIL [V WIN]]]]
     b. [AgrSP PHIL [TP/MVP SHOULD [VP t [V WIN]]]]

Therefore, I conclude that ASL modal data do not contradict the standard assumption that AgrS is structurally higher than T.[16] (See the Appendix for discussion of agreement verbs in ASL.)

In this section, I defended the hypothesis that AgrS in ASL is structurally higher than T, which follows from our null hypothesis that ASL's phrase structure is no different from that of other natural languages such as English. However, investigating

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[13] According to our analysis, it is predicted that (30) and (32) should both have the emphatic nuance. This prediction is consistent with Petronio's (1993) argument that the sentence-final position for the doubling construction is the head of FP (Focus Phrase). It might be the case that signers who interpreted the sentence in the emphatic context accepted the sentence, while other signers did not interpret the sentence in the same way. This could be related to the marginal grammatical status of (30). Signers who have the second dialect seem to require two instances of the modal to accommodate the emphatic affix.

[14] Aarons et al. (1992) argued that TP is structurally higher than AgrSP. They propose a phrase structure in which the Role Prominence Marker ("an optional marker that identifies the grammatical subject of the sentence as the person with whom empathy is established" (Aarons et al., 1992) occupies Spec of AgrSP. Hence the position should not be available for the subject NP. Since an ASL subject usually appears in the sentence-initial position, it was necessary for Aarons et al. to assume that TP is located above AgrSP, so the subject can be in Spec of TP. However, the nature of RPM, its syntactic position, and its relation to subject NP have not been investigated deeply enough. For example, according to their analysis, the subject never goes through Spec of AgrSP, and hence it is not clear how the subject NP checks off the D-features of AgrS. The nature of RPM must be investigated in more detail before discussing its implication for the theory of functional categories in ASL.

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[15] The movement seems to be obligatory in negative sentences. In the following examples, '___neg' indicates the scope of the non-manual negation marker, which is not directly relevant to the discussion here.

```
                        neg
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(i) a. *WILL NOT JOHN BUY CAR

```
                        neg
```
   b. JOHN WILL NOT BUY CAR (Petronio, 1993)

If the subject in ASL may stay in the Spec of VP position, (ia) should be grammatical. At this point I speculate that when NegP appears in the structure, the Neg head makes the D-feature of the AgrS strong. The strong D-feature causes the overt movement of the subject to Spec of AgrSP.

[16] Petronio (1993) also argued that TP is located above AgrSP based on data of agreeing verbs. However, it is not established that Infl (AgrS, AgrO) is responsible for Verb agreement. It is possible that verb agreement is licensed inside VP. See discussions in Appendix.

the precise nature of Modal in ASL requires further research. In particular, it is necessary to consider the distribution of Modal in relation to the object shift and overt verb raising in order to pursue the possibility suggested in this paper.

7. Conclusions

I have considered three sentence types of ASL and argued that these constructions are syntactically related in the following sense: derivations of these constructions involve overt verb raising. Verb movement to Infl occurs to save the otherwise stranded [asp] affix, even though the verb itself does not have a reason to be raised at the overt level. This verb raising is an instance of a syntactic operation driven by Enlightened Self Interest (Lasnik, 1995a,b). I also discussed Object Raising as a pure instance of Holmberg's generalization (Branigan, 1992). The fact that overt object shift in ASL is possible when the verb is inflected with [asp] marker provides empirical support for our verb raising analysis.

In our analysis of Verb Sandwich, I showed that the construction gives empirical support to Lasnik's (1995c) hypothesis that non-auxiliary verbs in some languages are selected from the lexicon in their bare form. Also, it gives support to the Copy Theory of Movement (Chomsky, 1995).

I mainly considered the property of the Aspect phrase and its relation to overt verb raising in ASL. The analysis is discussed in relation to the verb raising hypothesis (Pollock, 1989, Chomsky, 1995) as well as the issue of verbal morphology (Lasnik, 1995c). The scope of the current study is more limited than previous work on functional categories of ASL such as Aarons et al. (1992). However, in order to describe overwhelming numbers of apparently idiosyncratic sentence constructions in ASL, the approach of Aarons et al. had to postulate various language-specific stipulations and non-standard reinterpretations of notions previously proposed in linguistic theory. If ASL is a natural language which reflects the property of Universal Grammar, a study of ASL grammar should contribute to the goal of linguistic research in general by shedding light on our innate knowledge of human language. The current study is an attempt to pursue this goal.

However, a more complete theory of functional categories of ASL requires detailed investigation of other phenomena from the viewpoint of current Linguistic theory. Those phenomena should at least include negative constructions, wh-constructions, different types of modals, topicalization, 'tag' constructions, as well as other sentence patterns.

Appendix: Verb agreement and functional heads

Agreement verbs have been discussed in the literature in relation to the agreement system in ASL (Lillo-Martin, 1986; Petronio, 1993). In those previous works, it has been assumed that at least inflectional categories in ASL are head-initial. On the other hand, I presented evidence for the hypothesis that functional categories in ASL are head-final. In this section, I

consider the nature of verb agreement in relation to our hypothesis that functional categories in ASL are head-final. As our tentative hypothesis, I adopt the assumption that ASL verb agreement is licensed by Agreement heads via verb raising (Petronio, 1993).

A certain class of ASL verbs such as *HATE, BITE, GIVE, LOOK-AT, SHOW, SEND, ASK* are examples of agreement verbs. The verbal agreement on those verbs can be seen as a movement of the signing hand from the locus (an abstract spatial location established to represent a person who is not present) of the subject to the locus of the object. The agreement shows up whether NPs are overt or covert. (37) is an example of the verb agreement construction. The loci of the dog and the cat are introduced at the beginning of the sentence. Then the verb is signed with the movement from the locus of the dog to the locus of the cat.

(37) (DOG$_a$ CAT$_b$) pro$_a$ BITE pro$_b$
    'The dog bites the cat.' (Lillo-Martin, 1986)

If the loci of the dog and the cat are already established in the discourse, (38) is accepted as a grammatical sentence. Lillo-Martin (1986) argues that the verb agreement licenses null pronouns (*pro*). She assumes that the sentences (37) and (38) contain subject and object *pro*, which are licensed by verb agreement, as shown in (39).

(38) $_a$BITE$_b$
(39) (DOG$_a$ CAT$_b$) pro$_a$ BITE pro$_b$ (Lillo-Martin, 1986)

Now let us consider the following assumptions: (a) verb agreement is licensed by Agreement heads via verb raising and (b) Agreement phrases are head-final. Suppose that in examples (37)–(39), the verb shows up in the sentence-final position. This possibility leads us to assume that the licensing of *pro* or overt NP in agreement construction is done by AgrS and AgrO, assuming that AgrSP and AgrOP are both head-final. Suppose that verbs and NPs must raise overtly to satisfy the formal feature of Infl which licenses the agreement marker on the subject and the object (*pro*). Since verb agreement is a PF phenomenon, I assume that the movement must be overt (i.e. the Agr features for agreement verbs are strong).

(40)
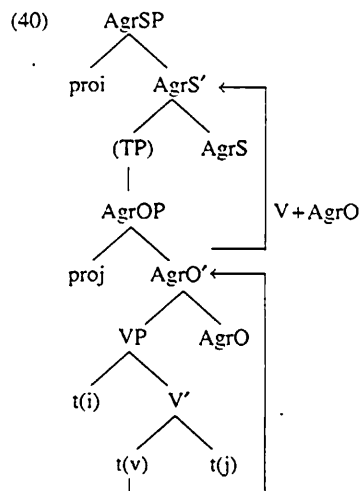
The derivation illustrated in (40) yields the representation (41):

(41) $(DOG_a \ CAT_b) \ pro_a \ pro_{b \ a} BITE_b$

However, this analysis fails to derive the grammatical sentence (42) below.

(42) $DOG_{a \ a} BITE_b \ CAT_b$ 'The dog bites the cat'

Hence, AgrS and AgrO cannot be head-final if I assume verb agreement is licensed by Infl.

Let us now consider a second possibility. Suppose that (a) verb agreement is licensed by Agreement heads via V-raising and (b) Agreement phrases are head-initial. See the following representation.

(43)
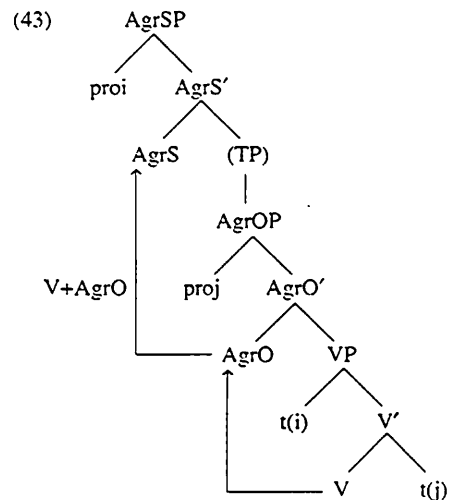
(43) correctly provides the derivation of (42). However, this analysis fails to explain ASL sentences with both [asp] marker and verb agreement.

In the main text, I provided evidence for the assumption that AspP in ASL is head-final. See the derivation in (44) below. The verb is raised to save the affixal [asp] head as shown in the derivation below. Note that the movement must be at the overt level, since verb agreement is an overt phenomenon.

(44)
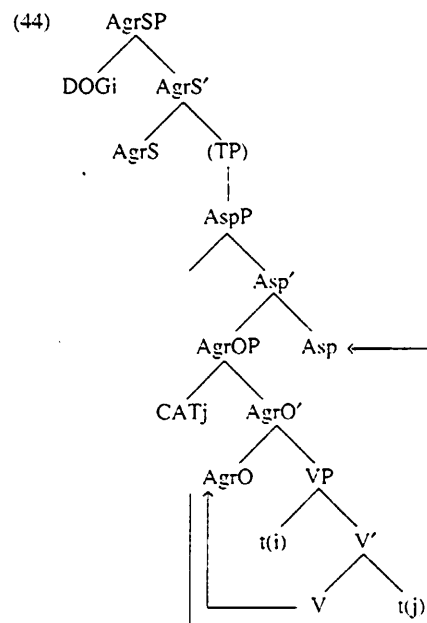
The representation in (44) shows that as long as the verb stays in the sentence-final position, it cannot license subject (verb) agreement, since AgrS is higher than Asp. Hence, (45) should be grammatical, while (46) is rejected.

(45)   a.   DOG $CAT_b \ BITE_b$[cont]
       b. $(DOG_a \ CAT_b) \ pro \ pro_b \ BITE_b$[cont]
(46)   a. $DOG_a \ CAT_{b \ a} BITE_b$[cont]
       b. $(DOG_a \ CAT_b) \ pro_a \ pro_b \ BITE$[cont]
          'The dog continuously bites the cat'

The judgment is not clear-cut, but it seems like (45) and (46) are both possible. This presents an empirical problem of the analysis that (a) verb agreement is licensed by Agreement heads via verb raising and (b) Agreement phrases are head-initial.

This head-initial Agr Hypothesis will face another problem. Consider the derivation in (44) again. The word order derived would be either of (47) or (48). (48) would be rejected by the surface-level constraint discussed earlier, which prohibits more than one of the same items from being next to each other.

(47)   DOG $CAT_b \ BITE_b$[asp]
(48)   *DOG $CAT_b \ BITE_b \ BITE_b$[asp]

However, since the object is overtly raised to Spec of AgrOP in the derivation (44), the grammatical sentence type (49) below can never be derived. The Head-initial Agr Hypothesis will lead to a contradiction if I assume that verb agreement is licensed by Infl via overt raising.

(49)   DOG$_a$ ₐBITE $_b$ CAT$_b$ BITE$_b$[asp]

To summarize, both the head-final Agr and head-initial Agr Hypotheses run into empirical problems, as long as I assume that verb agreement is licensed by Agreement heads. Since there is no third possibility about the headedness of a phrase, I will be led to assume that verb agreement is not licensed by AgrS or AgrO.

Since verb agreement is possible only with a certain class of verbs, I consider verb agreement as a lexical phenomenon. That is, the AgrS or AgrO heads are not responsible for the licensing of subject and object by an agreement verb. Rather, I assume that an agreement verb licenses the subject/object NP (whether they are overt NPs or *pro*) inside the VP before those NPs move out. This lexical licensing does not involve inflectional categories and hence is a totally different procedure from that of feature checking. I will leave the issue of characterization of verb agreement open for future research. I merely point out that this hypothesis might provide the reason for the fact that subject-verb agreement is not blocked by modal which could intervene between the subject and the verb (Petronio. 1993: 86–87).

(50) a.   ₂INDEX SHOULD ₁SHOW₁
         'You should show me.'

     b.   *Ann should asks John. (Petronio, 1993)

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