A constraint on copy deletion

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One version of the copy theory of movement holds that syntactic traces are full-fledged constituents which undergo a PF-deletion rule. In this paper, I propose a constraint on this rule. The constraint says that the lower copy of a chain can be phonologically deleted only if it ends an XP. I show that this constraint, conjoined with proposals that have been made concerning phrase structure (Chomsky 1994) and the semantics of NP in classifier languages (Chierchia 1998), explains a variety of facts in Dutch, German, Hebrew, Norwegian, Swedish and Vietnamese.

1. Introduction[1]

1.1. *Main hypothesis*

In one version of the 'copy theory', syntactic movement creates a sequence (α, β), where α and β are copies of the moved element at the derived and the base position, respectively. If the movement is overt, β undergoes phonological deletion (Chomsky 1995: 202).[2] For concreteness, let us say that there is an obligatory PF-rule, Delete, which applies

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[2] I assume the so-called 'xerox machine' version of the copy theory. Thus, the two copies are distinct tokens of a single type, and phonological deletion of one does not affect the pronunciation of the other.

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to (α, β) and erases as much phonetic material from β as possible.[3] This paper is about Delete. More specifically, it is about the domain of Delete. It proposes a condition on the set of chains to which Delete can apply, which I will call the set of *deletable chains*.

(1) Constraint on Copy Deletion (CCD)
A chain (α, β) is deletable only if β ends an XP

The CCD says, basically, that the phonetic material which is to be erased by Delete must be at the right edge of a maximal projection. In other word, the last phoneme of β must coincide with the last phoneme of an XP. Here is an example to show how the proposal works. Suppose we want to derive *the man will kick the ball*. At spell-out, we have (2).

(2) [$_{TP}$ [$_{DP}$ the man] will [$_{VP}$ [$_{DP}$ the man] kick the ball]]

The chain CH = (*the man*, *the man*) is deletable. The lower copy of CH ends an XP, because it is an XP. Consequently, Delete applies to CH, mapping (2) to (3). We account for the fact that movement of the subject to [Spec,T] leaves a gap at [Spec,V].

(3) the man will ~~the man~~ kick the ball

In fact, the CCD predicts that XP-movement always results in deletable chains. Let us now consider a case in which it is an X° that moves. In Hebrew, main verbs can undergo topicalization to [Spec,C], stranding their arguments. Significantly, the fronted verb has to be pronounced twice, both at the topic and at the base position.[4]

(4) liknot Dan kiva *(liknot) et ha-sefer
buy.INF Dan hoped *(buy.INF) ACC the-book
'As for buying, Dan hoped to buy the book'

[3] It is part of the definition of Delete that the lower copy is to undergo deletion, not the higher one. The privilege of the higher copy with respect to phonological realization is thus stipulated (cf. Bobaljik 1995, Brody 1995, Pesetsky 1998). Also, I leave open the possibility that a chain (α, β) is by definition deletable but only part of β is actually deleted, because deleting all of β would crash the derivation.

[4] I take movement of X° to [Spec,C] to be in principle possible (cf. Koopman 1984, Larson and Lebebvre 1991, Landau 2006, Vicente 2006). Consequently, I do not consider Chain Uniformity (Chomsky 1994, 1995) to be a basic principle of grammar. I come back to this issue in section 7.

This fact is derivable from the CCD. The lower copy of (*liknot*, *liknot*) is the head of VP. As Hebrew is a VO language, the head of VP does not end the VP. In fact, the lower copy of (*liknot*, *liknot*) does not end any XP, which means that this chain is not deletable. Consequently, the phonetic material of its lower member is not erased. The result is double pronunciation, as observed.[5]

Suppose a language has topicalization of verbs like Hebrew but its VP is head-final. We predict that there will be no double pronunciation of the fronted verb, since the lower copy of the resulting chain will end VP, making the chain deletable. German confirms this prediction. It is an OV language, and topicalization of verbs behaves just like topicalization of XPs: it creates a gap at the base position.[6]

(5) lesen wird er ein Buch (*lesen)
buy.INF will he a book (*buy.INF)
'He will read a book'

1.4. *Structure of the paper*

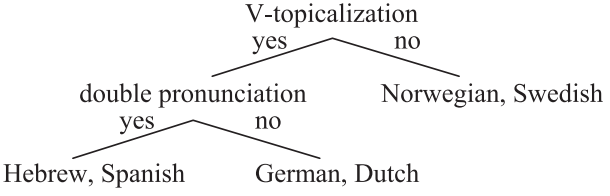
The rest of the paper is mostly devoted to presenting empirical arguments for the CCD. The next three sections discuss predicate fronting in a number of languages. The term 'predicate fronting' is used descriptively: it denotes the construction in which the clause-initial topic position is

[5] It has been observed for several languages that Ā-fronting of the verb requires double pronunciation of the sort similar to what is observed in Hebrew. See, for example, Aboh and Dyakonova (2009) for Gungbe, Cable (2004) for Yiddish, Cozier (2006) for Trinidad English, Kandybowicz (2008) for Nupe, Harbour (2008) for Haitian and Vicente (2007) for Spanish. To the best of my knowledge, these languages are VO languages. This fact thus supports the CCD. I hope to look more closely at these and other languages in the future.

[6] Cases such as (5) have been analysed as involving remnant movement, i.e. movement of the VP out of which the object has scrambled or extraposed (cf. den Besten and Webelhuth 1990, Müller 1998). I will argue below that it is possible in German to front V to [Spec,C]. The significant fact is the difference between Hebrew and German: V-to-[Spec,C] in the latter results in a deletable chain, while V-to-[Spec,C] movement in the former does not. Given the basic word order of Hebrew and German, this difference follows straightforwardly from the CCD.

occupied by a solitary transitive verb without any argument, as exemplified by (4) and (5). The languages I consider are Hebrew, Vietnamese, German, Dutch, Norwegian, Swedish, in that order. I aim to establish the following facts. (i) Hebrew, Vietnamese, German and Dutch have V-topicalization: these languages permits movement of V to [Spec,C]. (ii) When V is topicalized, Hebrew and Vietnamese pronounce the copy at the base position, while German and Dutch do not. (iii) Norwegian and Swedish do not have V-topicalization: all instances of predicate fronting in these two languages are remnant VP-topicalization. In other word, I provide evidence for the typology in (6).

(6)



I then show that the structure of (6) is not arbitrary, given the CCD and certain assumptions about language variation.

Section 5 turns to NP-split in Vietnamese. This language allows Ā-movement of the head of NP to [Spec,C]. However, double pronunciation is optional. This optionality turns out to be contrained by the semantics of N and other constituents in the DP. I will show that the CCD, together with the analysis of classifier languages proposed in Chierchia (1998), predicts the facts.

Section 6 addresses the issue of head-to-head movement, or head-adjunction, as opposed to the head-to-spec movement discussed in previous sections. Observationally, head-adjunction always creates a gap at the base position, whether this position is at the right edge of an XP or not. For example, the chain created by German V-to-T movement is by definition deletable – German VP being head-final – while the chain created by English T-to-C movement is not, as English TP is head-initial. But in both languages, the moved element is pronounced only once.

(7) a. dass sie das Buch (*lesen) lesen
that they the book (*read) lesen
'that they read the book'
b. will John (*will) read the book

Thus, head-adjunction poses a prima facie counterexample to the CCD. I discuss two approaches to this problem. The first assumes that head-adjunction is syntactic and involves reformulation of the CCD. The second takes head-adjunction to be a PF-operation and involves no alteration of the proposal at all.

Section 7 concludes the paper and discusses remaining issues and further work.

2. Predicate fronting in Hebrew and Vietnamese

2.1. *Introduction*

In Hebrew and Vietnamese, a topicalized verb is pronounced twice, clause-initially and before the direct object. The construction is represented schematically in (8).

(8) V ... V object

Both languages are SVO, hence the object follows the verb in VP. Suppose the two instances of V in (8) form an Ā-chain CH = (V, V). The CCD then predicts double pronunciation: CH is <u>not</u> deletable, since its lower copy is not at the right edge of an XP, but is separated from such an edge by the post-verbal object.[7]

(9) V ... [$_{VP}$ ... V object]
↑ → chain created = (V, V)

Thus, if (9) is the analysis of predicate fronting in Hebrew and Vietnamese, the CCD explains the phenomenon of double pronunciation in these languages. In the next two subsections, I offer independent evidence that (9) <u>is</u> the correct analysis of predicate fronting in Hebrew and Vietnamese.

[7] I assume that all non-trivial chains are two-membered. Successive-cyclic movement results in several chains, with the higher member of one possibly being the lower member of another. If the verb moves cyclically through the specifiers of several CP's, only the lowest chain fails to be deletable, since only the lower member of that chain fails to be at the right edge of an XP. The reason is that specifiers are by definition maximal projection (cf. Muysken 1983, Chomsky 1995: 241–249).

2.2. *Hebrew and Vietnamese*

Let us start with Hebrew.[8] Consider (4) again, repeated here in (10).[9]

(10) liknot Dan kiva liknot et ha-sefer
buy.INF Dan hoped buy.INF ACC the-book
'As for buying, Dan hoped to buy the book'

There are reasons to think that Hebrew predicate fronting involves Ā-movement. The relation between the two instances of the verb in (10) shows island-sensitivity effects typical of Ā-dependency.[10]

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[8] Hebrew data are provided by Omer Preminger.

[9] The fact that the downstairs verb must be overt might be due to the inability of *kiva* to license VP ellipsis. In other word, *kiva* might be similar to contracted auxiliaries in English (King 1970) or the null copula in African-American vernacular English (Labov 1969). However, *kiva* can in fact license a gap, so double pronunciation in (10) cannot be due to *kiva*'s inability to be followed by an empty category.

(i) liknot et ha-sefer Dan kiva
buy.INF ACC the-book Dan hoped
'Dan hoped to buy the book'

[10] Note that (10) shows that the relation can cross a non-finite clause-boundary. When the lower copy is inside a finite embedded clause introduced by the complementizer *še*, there seems to be variation among speakers with respect to the acceptability of the sentence, ranging from "ok" to "two question marks."

(i) (??)liknot eyn li safek še-Dan kiva liknot
buy.INF there-is-not to-me doubt that-Dan hoped buy.INF
et ha-sefer
ACC the-book
('As for buying, I have no doubt that Dan hoped to buy the book')

I have no explanation for this variation. The overt complementizer seems to block movement of the verb from the embedded clause. This could mean that the relevant movement is a case of long head movement to a non-L-related position, namely C (cf. Roberts 1994). Or it could mean that whatever is responsible for the *that*-trace effect is at play. I will not attempt to settle this question here. However, note that in (11)–(14), all the embedded sentences are introduced by the overt complementizer. If the complementizer is what makes (i) worse than (10), (11)–(14) would constitute not just island violations, but also violation of whatever degrades (i). I thank Omer Preminger for drawing my attention to this fact.

(11) Complex NP island

*liknot Dan daxa et ha-te'ana še-hu kiva
buy.INF Dan rejected ACC the-claim that-he hoped
liknot et ha-sefer
buy.INF ACC the-book
('As for buying, Dan rejected the claim that he hoped to buy the book')

(12) Subject island

*liknot še-Gil yirce liknot et ha-sefer
buy.INF that-Gil want.FUT buy.INF ACC the-book
ze cafuy
COP expected
('As for buying, that Gil will want to buy the book is expected')

(13) Adjunct island

*liknot Dan samax ki Dina kiva liknot
buy.INF Dan was.happy because Dina hoped buy.INF
et ha-sefer
ACC the-book
('As for buying, Dan was happy because Dina hoped to buy the book')

(14) Factive/non-bridge island

*liknot Dan laxaš/hitca'er še-Dina kiva
buy.INF Dan whispered/regretted that-Dina hoped
liknot et ha-sefer
buy.INF ACC the-book
('As for buying, Dan *whispered/*regretted that Dina hoped to buy the book')

The question now is whether Hebrew predicate fronting involves Ā-fronting of V or is remnant VP movement. The remnant movement analysis requires the object to extrapose to the right or to shift to the left of VP. Let us consider the first alternative. Suppose the derivation contains the following steps.

(15) a. Extraposition of the object

$[_{VP}$ verb object] ... object
↑ → chain created = (object, object)

b. Remnant VP-topicalization
[$_{VP}$ verb object] … [$_{VP}$ verb object] … object
↑ └──────────────────┘ → chain created = (VP, VP)

If (15) is the correct analysis, we predict that the stranded object must be able to extrapose. This prediction is arguably wrong. It is a fact about Hebrew that weak pronouns such as *oto* 'it' do not extrapose easily. Observe the contrast in (16).

(16) a. Dan kiva liknot oto maxar
Dan hoped buy.INF it tomorrow
b. ??Dan kiva liknot maxar oto
Dan hoped buy.INF tomorrow it

When the object is a full DP, there is no such contrast: full DPs have no problem extraposing.

(17) a. Dan kiva liknot et ha-sefer maxar
Dan hoped buy.INF ACC the-book tomorrow
b. Dan kiva liknot maxar et ha-sefer
Dan hoped buy.INF tomorrow ACC the-book

If Hebrew predicate fronting requires the object to have extraposed before the remnant VP fronts, there should be a contrast between (10) and (18): in the former, the alleged extraposed constituent is a full DP, while in the latter, it is a pronoun. This prediction is not born out, as (18) is perfectly acceptable.

(18) liknot Dan kiva liknot oto
buy.INF Dan hoped buy.INF it
'As for buying, Dan hoped to buy it'

Now consider the object shift version of the remnant movement analysis. Suppose (18) is derived as (19).

(19) a. Scrambling of the object to the left of VP
oto … [$_{VP}$ liknot oto]
↑ └──────────┘

b. Adjunction of V to a null functional head above the scrambled object
[$_{F}$ liknot F] … oto … [$_{VP}$ liknot oto]
↑ └──────────────────┘

c. Topicalization of the remnant VP
[$_{VP}$ liknot oto] … [$_{F}$ liknot F] … oto … [$_{VP}$ liknot oto]

This derivation faces several problems. First, the steps in (19a) and (19b) are not independently attested in Hebrew (Landau 2006: 51, Omer Preminger p.c.). Second, it would be a total mystery why only *liknot* is pronounced at [Spec,C] and not both *liknot* and *oto*. In fact, it would be a mystery why the matrix [Spec,C] is pronounced at all, since the VP occupying it contains only 'traces' of earlier movement operations.

We take these facts to indicate that Hebrew predicate fronting is V-topicalization. The double pronunciation of V follows from the CCD, given the basic word order of Hebrew.

Let us now turn to Vietnamese. Topicalization in this language involves moving the relevant constituent to the left of the topic marker *thi*, which I will take to be a C head.

(20) a. no nen doc sach
he should read book
'He should read books'
b. no thi nen doc sach
he TOP should read book
'As for him, he should read books'
c. sach thi no nen doc
book TOP he should read
'As for books, he should read them'

As in Hebrew, topicalization of the main predicate does not create a gap at the base position. Repetition of the fronted verb is obligatory.[11]

(21) doc thi no nen *(doc) sach
read TOP he should *(read) book
'As for reading, he should read book'

[11] The modal verb *nen* 'should' can license VP-ellipsis. So double pronunciation in this case cannot be due to the modal's inability to be followed by a gap (see note 9).

(i) doc sach thi no nen
read book TOP he should
'read books, he should'

The relation between the topic and the base position exhibits standard symptoms of Ā-movement: it is not clause-bound and it is constrained by islands.[12]

(22) Unboundedness
doc thi toi nghi la no nen doc sach
read TOP I think that he should read book
'As for reading, I think that he should read books'

(23) Complex NP island
*doc thi toi tin chuyen no doc sach
read TOP I believe story he read book
('As for reading, I believe the story that he reads books')

(24) Subject island[13]
*doc thi no doc sach la tot
read TOP he read book COP good
('As for reading, that he reads books is good')

(25) Adjunct island
*doc thi no vui vi toi doc sach
read TOP he happy because I read book
('As for reading, he is happy because I read books')

(26) Factive/non-bridge island
*doc thi toi tiec/thi-thao la no doc sach
read TOP I regrett/whisper that he read book
('As for reading, I regretted/whispered that he read books')

Having provided evidence that predicate fronting in Vietnamese is Ā-movement, I now argue that the movement is V-topicalization rather

[12] The possibility that the verb fronts by head-to-head movement is ruled out: the topicalized verb is to the left of the overt C head, which is an independent word, not an affix. Also, the movement is not A-movement either, since the matrix subject intervenes.

[13] Subject clauses in Vietnamese are <u>not</u> introduced by an overt complementizer.

(i) (*la) no doc sach la tot
(*that) he read book COP good
'That he reads books is good'

than topicalization of a remnant VP. Consider first the possibility that scrambling feeds VP fronting. In fact, objects in Vietnamese can scramble out of VP by a process distinct from topicalization.[14]

(27) quyen sach nay no nen doc
CL book this he will read
'He should read this book'

However, this operation is subject to two conditions: the landing site must be higher than [Spec,T] and the object must be definite.[15]

(27) The object must be higher than [Spec,T]
*no nen quyen sach nay doc
he should CL book this read
('He should read this book')

(28) The object must be definite
*mot quyen sach no nen doc
one CL book he should read
('He should read a book')

[14] The topic marker *thi* can be phonologically null in Vietnamese (provided there be a significant pause between the topic and the rest of the sentence).

(i) sach (thi) no nen doc
book (TOP) he should read
'Books, he should read'

This fact might raise the question whether what I call object scrambling is just topicalization with a phonologically empty topic marker. I think the answer is negative, for the following reason. Topicalization is not recursive in Vietnamese.

(ii) *no thi sach thi nen doc
he TOP book TOP should read
('As for him, books he should read')

However, it is possible to topicalize the subject and move the object above the modal verb at the same time.

(iii) no thi quyen sach nay nen doc
he TOP CL book this should read
'As for him, this book he should read'

[15] The object can appear between the subject and the modal. But this might just be because the subject can be construed as a topic (see previous note).

Stranded objects in predicate fronting constructions do not have to show any of these properties: they can stay below [Spec,T] and they can be indefinite.[16]

(29) doc thi no nen doc mot quyen sach
read TOP he should read one CL book
'As for reading, he should read a book'

The assumption that object extraposition feeds VP-topicalization is not plausible either. In Vietnamese, short bare nouns such as *sach* 'book' cannot extrapose.[17]

(30) a. no doc sach hom-qua
he read book yesterday
b. *no doc hom-qua sach
he read yesterday book

But (21) shows that *sach* can be stranded. I conclude that predicate fronting in Vietnamese is V-topicalization. Double pronunciation of V follows from the CCD and the basic word order of this language.

2.3. *Summary*

We have seem evidence that predicate fronting in Hebrew and Vietnamese is topicalization of a single verb to [Spec,C].

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[16] Another piece of evidence that the object has not scrambled is (i).

(i) doc thi no nen thuong-xuyen doc sach
read TOP he should frequently read book
'As for reading, he should read books frequently'

The presence of the VP-adverb *thuong-xuyen* 'frequently' to the left of the verb and the object suggests that both of these are inside the VP. Also, note that predicate fronting does not exclude the object occupying the pre-TP position.

(ii) doc thi quyen sach nay no nen doc
read TOP CL book this he should read
'As for him, this book he should read'

[17] Of course, there is the possibility of saying that the object scrambles above [Spec,T], and then the verb, the modal and the subject all undergo movement to establish the underlying word order again, and then the remnant VP, which contains only traces now, moves to [Spec,C], and for some mysterious reason the head of VP is pronounced but not any other of its constituents. I will not pursue this line of analysis.

(31) $[_{CP}$ V ... $[_{VP}$ ... V object #]]
↑ ⌊ → chain created = (V, V)

Given this analysis, the CCD explains the fact that the topicalized verb is pronounced twice, both at the matrix [Spec,C] and at the base position. In this sense, Hebrew and Vietnamese give empirical support to the CCD.[18]

3. Predicate fronting in German and Dutch

3.1. *Introduction*

There is another way to explain the double pronunciation phenomenon in Hebrew and Vietnamese. Suppose that instead of the CCD, I postulate the following: CH = (α, β) is deletable only if CH is uniform, i.e. only if α and β are identical with respect to being an XP and being an X° (Chomsky 1994). Call this the Revised Constraint on Copy Deletion (RCCD). It follows that CH = (α, β) is not deletable if α is an XP and β is not an XP. Given 'bare phrase structure' (Chomsky 1994), V-topicalization does produce such a chain: the higher V copy is an XP, since it does not project (it is the specifier of CP), but the lower V copy is not an XP, since it does project (it is the head of VP). The chain (V, V) would not be deletable under the RCCD, and double pronunciation would result.

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[18] Although intransitives and unaccusatives are not the main concern of this paper, it is perhaps worth noting that when an intransitive or unaccusative verb is fronted in Hebrew and Vietnamese, double pronunciation is not obligatory, but optional (thanks go to Omer Preminger for providing the Hebrew facts).

(i) Hebrew
lalexet Dan kiva (lalexet)
walk.INF Dan hoped (walk.INF)

(ii) Vietnamese
den thi no se (den)
come TOP he will (come)

This fact follows straightforwardly from the CCD and the theory proposed in Hale and Keyser (1993), according to which intransitives are hidden transitives with covert objects: when V is fronted, double pronunciation is obligatory, and when VP is fronted, it is impossible, and as both V- and VP-fronting are available in Hebrew and Vietnamese, optionality of double pronunciation is observed.

In this section, I argue that the CCD is correct, and the RCCD is not. German and Dutch deliver the decisive evidence. These languages have predicate fronting like Hebrew and Vietnamese. However, they are SOV languages: their VP is head-final. Now suppose that we find – in German and Dutch – an example E of predicate fronting which is derived by V-topicalization, as in (32).

(32) $[_{CP}\ V \ldots [_{VP} \ldots \text{object } V]]$
$\uparrow$ ⌊ $\rightarrow$ chain created = (V, V)

The CCD and the RCCD make different predictions for E. Specifically, the CCD predicts that the lower V copy is deleted, since it is at the right edge of VP, but the RCCD predicts that the lower V copy is not deleted, since (V, V) is not uniform, hence not deletable. Since predicate fronting constructions in German and Dutch never show double pronunciation of the topicalized verb, the CCD receives empirical support if some of these constructions are just like E, i.e. are derived by V-topicalization. In other word, we have empirical argument for the CCD and against the RCCD if German and Dutch permits V-topicalization.[19] This is precisely what I aim to show in the next two subsections.

3.2. *German and Dutch*

It has frequently been observed that German allows a (non-tensed) verb without any arguments to occupy the Vorfeld (Thiersch 1985, den Besten and Webelhuth 1987, Müller 1998, Fanselow 2002, Hinterhölzl 2002, among others). Here are two examples from Hinterhölzl (2002: 127).[20]

[19] If all examples of predicate fronting in German and Dutch turn out to involve remnant VP movement, we will not be able to distinguish empirically between the CCD and the RCCD. On the other hand, we do not need to show that all instances of predicate fronting in German and Dutch are V-topicalization. It is compatible with my proposal that some predicate fronting constructions in these languages are in fact derived by remnant VP movement. The crucial point is that for those instances that are derived by V-topicalization, the CCD makes the right prediction while the RCCD does not.

[20] I presuppose the analysis of German which takes the finite verb of an independent clause to occupy C and the constituent before that finite verb to occupy [Spec,C] (cf. Fanselow and Felix 1987, for example). Also, to simplify the discussion, I take infinitives and past participles to be the head of VP. It may well be that infinitives and participles are spell-

(33) a. lieben will Hans die Maria
love wants Hans the Maria
'Hans wants to love Maria'
b. gelesen hat Hans das Buch
read has Hans the Buch
'Hans has read the book'

It has been assumed that predicate fronting in German is regular topicalzation (cf. Thiersch 1985, den Besten and Webelhuth 1987, Müller 1998). Indeed, the relevant characteristic features of Ā-movement to [Spec,C] are attested, namely clause unboundedness and island-sensitivity.

(34) Unboundedness[21]
lesen denke ich wird Hans ein Buch
read think I will Hans a book
'I think Hans will read a book'

(35) Complex NP island
*lesen glaube ich die Geschichte, dass Hans
read believe I the story, that Hans
ein Buch wird
a book will
('As for reading, I believe the story that Hans will read a book')

(36) Subject island
*lesen ist dass Hans ein Buch wird ganz überraschend
read is that Hans a book will totally surprising
('That Hans will read a book is totally surprising')

(37) Adjunct island
*lesen bin ich glücklich, weil Hans ein Buch wird
read am I happy because Hans a book will
('As for reading, I am happy because Hans will read a book')

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out forms of V adjoined to some functional head F. However, as long FP is head-final, the argument is unaffected (see below for more discussion on head-adjunction).

[21] Marie-Christine Meyer (p.c.) reports that (i) is slightly worse than (34). I have no explanation for this contrast (but see note 10).

(i) ?lesen denke ich, dass Hans ein Buch wird
read think I that Hans a book will
'As for reading, I think Hans will read a book'

(38) Factive/non-bridge island
*lesen bereue/flüstere ich, dass Hans ein Buch wird
read regret/whisper I that Hans a book will
('As for reading, I reget/whisper that Hans will read a book')

The remnant movement analysis seems particularly suited for German, since this language has scrambling (cf. den Besten and Webelhuth 1987, Müller 1998). However, arguments have been given that topicalization of the main verb in German may take place without any VP constituent having scrambled or extraposed out of VP. Let us consider some of them (see Fanselow 2002, Hinterhölzl 2002 for more extensive discussion).

In German, wh-phrases can be used as interrogative pronouns or as indefinites. But irrespective of their function, wh-phrases do not scramble (cf. Müller and Sternefeld 1993). The contrast in (39) shows the resistance of interrogative wh-phrases to scrambling. (40) shows the same for wh-indefinites.

(39) Interrogative wh-phrases cannot scramble (Müller and Sternefeld 1993: 471)
a. ich weiß nicht, wem$_1$ der Fritz t_1 was gesagt hat
I know not, to whom the Fritz what said has
b. *ich weiß nicht, wem$_1$ was$_2$ der Fritz t_1 t_2
I know not, to whom what the Fritz
gesagt hat
said has
'I don't know what Fritz said to whom'

(40) Indefinite wh-phrases cannot scramble (Marie-Christine Meyer p.c.)
a. dass der Fritz wen geküsst hat
that the Fritz whom kissed has
b. *dass wen der Fritz geküsst hat
that whom the Fritz kissed has
'That Fritz has kissed someone'

Let us register another fact about German. In this language, extraposed materials must follow both the main verb – if it is not in C – and any aux-

iliary that follows the main verb. Extraposition to a position between the main verb and a following auxiliary is not possible.

(41) a. dass er [von einer schönen Frau] geträumt hat
that he of a beautiful woman dreamed has
b. dass er t_1 geträumt hat [von einer schönen Frau]$_1$
that he dreamt has of a beautiful woman
c. *dass er t_1 geträumt [von einer schönen
that he dreamt of a beautiful
Frau]$_1$ hat
woman has
'That he has dreamt of a beautiful woman'

This means that the presence of an auxiliary to the right of α indicates that α has not extraposed. It then follows that if the object of a topicalized verb is a wh-phrase and precedes an auxiliary, it must be inside VP: it cannot have scrambled, because wh-phrases do not scramble, and it cannot have extraposed, because extraposed constituents must follow the auxiliary. But if the object has neither scrambled nor extraposed, the topicalized verb cannot be a remnant VP, since no remnant VP was created. (42) and (43) instantiate just this scenario.

(42) Interrogative wh-phrases (Fanselow 2002: 101)
geküsst wüsste ich gern wer wen hat
kissed knew I gladly who whom.ACC has
'I would like to know who kissed whom'

(43) Indefinite wh-phrases (Fanselow 2002: 103)
geküsst dürfte er schon öfter wen haben
kissed might he already more-often whom.ACC have
'He may very well have kissed somebody quite often'

The object *wen* in (42) and (43) must be VP-internal. Consequently, the verb which occupies the matrix [Spec,C] in these sentences is just that: the verb. It cannot be a remnant VP. Thus, (42) and (43) indicate that German permits V-topicalization.

Let us consider one more argument that V-topicalization is possible in German. It has been observed that scrambled objects become opaque for extraction (Müller 1998). This is evidenced by the contrast in (44) (Müller 1998: 12).

(44) a. worüber$_1$ hat keiner [ein Buch t_1] gelesen
about-what$_1$ has no one a book read
b. *worüber$_1$ hat [ein Buch t_1]$_2$ keiner t_2 gelesen
about-what$_1$ has a book no one read

Now consider (45a) and (45b) (taken from Fanselow 2002: 110). In (45b), the pronoun *da* 'there' is extracted from the PP *damit* 'therewith'. This means that the PP has not scrambled. But it cannot have extraposed either, since it is followed by the auxiliary *haben*.

(45) a. er dürfte sie ja wohl kaum damit
he might her yes well barely there with
widerlegt haben
refuted have
b. widerlegt dürfte er sie da$_1$ ja wohl
refuted might he her there yes well
kaum [t_1 mit] haben
barely with have
'He is not really likely to have refuted her with that'

It follows that [Spec,C] in (48b) cannot contain a remnant VP, since no remnant VP was created in the first place. Thus, (48b) is a case of V-topicalization. I conclude – following Fanselow (2002) and Hinterhölzl (2002) – that not all cases of German predicate fronting involve remnant VP-topicalization.[22] In other word, German does have V-topicalization. That there is never double pronunciation follows from the CCD, given the basic word order of German.

A similar argument can be made for Dutch.[23] Example (46) shows two examples of predicate fronting in this language, while (47)–(51) indicate that the construction involves Ā-movement.

[22] The theories which Fanselow and Hinterhölzl propose actually involve moving a VP to [Spec,C], not a V, as I have argued for. Specifically, Fanselow takes the moving V to be a VP in itself. His theory entails a revision of the traditional theta-theory. Hinterhölzl takes the fact that only a verb is pronounced at [Spec,C] to result from partial deletion. I take the empirical data that these authors present to support their analyses without adopting these analyses.

[23] Thanks go to Hedde Zeijlstra for providing the Dutch examples.

(46) a. kussen wil Jan een vrouw
kiss wants Jan a woman
'Jan wants to kiss a woman'
b. gedronken heeft Jan een biertje
drunk has Jan a beer
'Jan drank a beer'

(47) Unboundedness
lezen denk ik dat Jan een boek wil
read think I that Jan a book wants
'I think Jan wants to read a book'

(48) Complex NP island
*lezen geloof ik dat verhaal, dat Jan een boek wil
read believe I the story, that Jan a book wants
('As for reading, I believe the story that Jan wants to read a book')

(49) Subject island
*lezen is dat Jan een boek wil totaal verrassend
read is that Jan a book wants totally surprising
('As for reading, that Jan wants to read a book is totally surprising')

(50) Adjunct island
*lezen ben ik gelukkig, omdat Jan een boek wil
read am I happy because Jan a book wants
('As for reading, I am happy because Jan wants to read a book')

(51) Factive/non-bridge island
*lezen betreuer/fluister ik, dat Jan ein boek wil
read regret/whister I that Jan a book wants
('As for reading, I regret/whisper that Jan wants to read a book')

Is predicate fronting possible in Dutch when the object of the fronted verb stays inside VP? I think the answer is yes. Consider (52).

(52) gekust wil hij vaak een vrouw hebben
kissed wil he often a woman have
'he wants to have often kissed a woman'

The fact that the object *een vrouw* is precedeed by a VP-adverb suggests that it has not scrambled out of the VP (*vaak* 'often' can modify the event of kissing). And the fact that *een vrouw* is followed by the auxiliary *hebben* is evidence that it has not extraposed. If the object in (52) had extraposed, its surface position would have to be one between the auxiliary *hebben* and the base position of *gekust*. In other word, the derivation would have to contain the step in (53).

(53) The object extraposes to a position between the main verb and the auxiliary
[$_{VP}$ [$_{XP}$ [$_{VP}$ ... ~~een vrouw~~ gekust] een vrouw] hebben]

But step (53) is not available in Duch: it is not possible in this language to extrapose a DP object to a position between the main verb and a sentence-final auxiliary. This is shown by the contrast in (54).

(54) a. Jan wil een vrouw gekust hebben
Jan wants a woman kissed have
b. * Jan wil gekust een vrouw hebben
Jan wants kissed a woman have
'Jan M have kissed a woman'

I conclude that the object *een vrouw* in (52) has neither scrambled nor extraposed. Consequently, Dutch has V-topicalization. The fact that there is no double pronunciation follows from the CCD, given the basic SOV word order of Dutch.

3.3. *Summary*

We have argued that German and Dutch permits V-topicalization: the main verb can raise to [Spec,C], with other VP constituents remaining in situ. Schematically:

(55) [$_{CP}$ V ... [$_{VP}$ ... object ~~V~~ #]]
→ chain created = (V, V)

Given the basic SOV word order of German and Dutch, the absence of double pronunciation follows from the CCD: (V, V) is deletable, since the lower V copy is at the right edge of VP.

4. Predicate fronting in Norwegian and Swedish

4.1. *Introduction*

Norwegian and Swedish are SVO languages. The CCD predicts that if V is fronted to [Spec,C] in these languages, double pronunciation will result, since the lower V copy is not at the right edge of an XP. To the best of my knowledge, predicate fronting in Norwegian and Swedish does not show double pronunciation. It follows that if the CCD is true, predicate fronting in Norwegian and Swedish cannot be V-topicalization, but must be remnant VP movement. The next two subsections attempts to show that Norwegian and Swedish are not counterexamples to the CCD, i.e. that these languages do not have V-topicalization.

4.2. *Norwegian and Swedish*

Let us start with Norwegian.[24] I have not been able to find systematic discussion of Norwegian with respect to predicate fronting. From the data I collected, however, it appears that Norwegian lacks V-topicalization. Consider (56).

(56) a. syngi har jeg ikke
sung have I not
'I did not sing'

b. syngi trur jeg at han ikke har
sung believe I that he not has
'I believe he did not sing'

[24] Thanks go to Sverre Johnsen for providing the Norwegian data.

These sentences show that Norwegian allows [Spec,C] to be occupied by intransitive verbs. However, when the verb is transitive, topicalization is possible only if the object is fronted together with the verb.

(57) a. sett mannen har jeg ofte
seen the-man have I often
b. *sett har jeg oft mannen
seen have I often the-man
'I often saw the man'

This suggest that Norwegian allows VP-topicalization, but not V-topicalization. Consequently, predicate fronting in Norwegian must be remnant VP movement, which means that it is possible only if the object has evacuated the VP. This seems correct, as (58) was judged as relatively acceptable by my informant.

(58) ?sett har jeg dem ofte
seen have I them often
'I saw them often'

In (58), the object has shifted out of the VP, as the VP-adverb to its right indicates. The surface word order results from moving the remnant VP to [Spec,C]. I tentatively conclude that Norwegian does not have V-topicalization.

Now let us turn to Swedish. Holmberg (1999) claims that Swedish has V-topicalization on the basis of such examples as (59) (Holmberg 1999: 7).

(59) Kysst har jag henne inte (bara hållit henne i handen)
kissed have I her not (only held her by the-hand)
'Kissed her I haven't (only held her by the hand)'

But note that in (59), the object pronoun is to the left of the sentential negation. Thus, (59) could be derived by Object Shift followed by topicalization of the remnant VP.[25] Holmberg, however, argues that that is not

[25] Supporting evidence for such an analysis is found in an observation made in Engels and Vikner (2009: 4, note 2), namely that "Object Shift is usually optional in Swedish but it is obligatory if the verb occurs in topic position."

the derivation of (59). Instead, he proposes that (59) is derived by topicalization of V followed by counter-cyclic Object Shift, as in (60).

(60) a. V-topicalization
[$_{CP}$ kysst … [$_{TP}$ … inte [$_{VP}$ t_V henne]]]

b. Object Shift (counter-cyclic)
[$_{CP}$ kysst … [$_{TP}$ … henne inte [$_{VP}$ t_V t_{DP}]]]

The reason for Holmberg to choose (60) as the derivation of (59) is Holmberg's Generalization (HG).

(61) Holmberg's Generalization (Holmberg 1999: 15)
Object Shift cannot apply across a phonologically visible category asymmetrically c-commanding the object position except adjuncts

Assuming HG, it would indeed be impossible to derive (59) by first shifting the object and then topicalizing the VP, because the first step of this derivation will violate HG: it is Object Shift applying across a phonologically visible category c-commanding the object position, namely the verb.

(62) Object Shift
henne inte [$_{VP}$ … **kysst** henne]

Holmberg postulates HG on the basis of facts such as (63) (Holmberg 1999: 1–2). These show that when an overt VP-internal constituent precedes the object, the latter cannot shift across the former.

(63) a. Overt V blocks OS
*jag har henne$_1$ inte [$_{VP}$ **kysst** t_1]
I have her not kissed

b. Overt indirect object blocks OS
*jag gav$_1$ den$_2$ inte [$_{VP}$ t_1 **Elsa** t_2]
I gave it not Elsa

c. Overt verb particle blocks OS
*dom kastade$_1$ mej$_2$ inte [$_{VP}$ t_1 **ut** t_2]
they threw me not out

Holmberg also presents (64) as supporting evidence for HG (Holmberg 1999: 8–9).

(64) a. jag hörde henne$_1$ inte [t$_1$ hålla föredrag]
I heard her not give talk
b. [hörde henne hålla föredrag] har jag inte
heard her give talk have I not
c. *[hörde t$_1$ hålla föredrag] har jag henne$_1$ inte
heard give talk have I her not
'Heard her give a talk, I have not'

Example (64a) shows that the subject of the small clause can shift to the left of the matrix negation, while (64b) shows that fronting of a VP which contains a small clause is possible. If HG does not hold, nothing prevents us from deriving the ungrammatical (64c) by first shifting *henne* to the left of the matrix negation, then fronting the remnant matrix VP to [Spec,C], as in (65).

(65) a. Object Shift
henne$_1$ inte [$_{VP}$ … hörde [t$_1$ hålla föredrag]]
b. VP-topicalization
[$_{VP}$ … hörde [t$_1$ hålla föredrag]] … henne$_1$ inte t$_{VP}$

On the other hand, if HG is true, the derivation in (65) will not be possible, because (65a) violates HG: *henne* is shifted across *hörde*, which is phonologically visible and c-commands *henne*.

Thus, (63) and (64) led Holmberg to HG, and HG lead him to say that (59) has the derivation in (60), and consequently that Swedish has V-topicalization. Now note that while the second link is logical, the first is not. In other word, HG logically implies that Swedish predicate fronting is V-topicalization, but the facts in (63) and (64) do not logically imply HG. If there is another explanation for the facts which does not require HG, then Swedish predicate fronting can be analyzed as remnant VP movement.

Such an explanation is given in Fox and Pesetsky (2005). These authors propose a theory of syntax-phonology mapping that includes the following premises.

(66) Fox and Pesetsky (2005)
  a. Spell-out linearizes VP and CP ('phases') cyclically
  b. Spell-out cannot add inconsistent information
  c. Traces are invisible to Spell-out

The reader should consult Fox and Pesetsky's original paper for details.[26] For present purposes, I will just concentrate on the second assumption – (66b) – which can be stated informally as follows: if α precedes β at one Spell-out, α precedes β at every Spell-out. For example, if V precedes the object when VP is spelled out, then V must precede the object when CP is spelled out. This theory turns out to account elegantly for all the facts in (63) and (64). Example (63a) is bad because the verb precedes the object when VP is spelled out but follows it when CP is spelled out. Similarly for (63b) and (63c), with the role of the verb played by the indirect object and the particle, respectively. The ungrammaticality of (64c) is due to the fact that when the VP containing the small clause is spelled out, the small clause subject *henne* precedes *hålla* and *foredrag*, but when the matrix CP is spelled out, it follows *hålla* and *foredrag*.

Fox and Pesetsky also present the following contrast as additional evidence for their theory and against HG.

(67) a. ?[Gett henne t_1] har jag den_1 inte ...
  given her have I it not
  b. *[Gett t_1 den] har jag $henne_1$ inte ...
  given it have I her not

The relative acceptability of (67a) shows that Object Shift across the verb followed by remnant movement of VP must be possible in Swedish. More significantly, the contrast between (67a) and (67b) speaks against HG, since HG predicts no contrast between these sentences. They incur the same violation of HG, namely Object Shift across the verb, and should thus be equally bad. The theory of Fox and Pesetsky, on the other hand, predicts the contrast in (67). In (67a), the relative order between *gett*,

[26] Fox and Pesetsky's (2005) proposal holds that 'traces' are irrelevant for determining linear order. In other word, only higher copies play a role. As far as I can see, this does not affect my proposal: Fox and Pesetsky's theory determines the linear order of higher copies of chains, and the CCD determines whether the lower copy of a single chain can be deleted.

henne and *den* remains the same at both the VP and the CP level. In (67b), this is not the case: when VP is spelled out, the order is *gett* < *henne* < *den*, but when CP is spelled out, it is *gett* < *den* < *henne*.

Thus, the theory of Fox and Pesetsky explains the facts without invoking HG. Since HG is what forces Holmberg to reject the remnant movement analysis for Swedish predicate fronting, Fox and Pesetsky have in effect shown that this analysis is possible. These authors actually went further and show that the remnant movement analysis is necessary, i.e. that not only does Swedish have remnant VP topicalization, it also lacks V-topicalization. Consider the following examples (Fox and Pesetsky 2005: 27).

(68) a. *Hört$_V$ har jag henne$_1$ inte t$_V$ [t$_1$ hålla föredrag]
heard have I her not give talk
b. *Hört$_V$ har jag inte t$_V$ [Per hålla föredrag]
heard have I not Peter give talk

If V-topicalization were possible in Swedish, we would incorrectly expect (68a–b) to be acceptable: they could be derived by moving the main verb to [Spec,C].[27] But if V-topicalization is impossible in Swedish, the ungrammaticality of (68a–b) might be accounted for by invoking the general impossibility of extracting the ECM infinitival from the VP containing it (Fox and Pesetsky 2005: 27).

Based on the facts above, I conclude that Swedish does not have V-topicalization.[28]

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[27] Note that the German counterpart of (68) is perfectly acceptable (Marie-Christine Meyer, Irene Heim p.c.)

(i) arbeiten habe ich ihn gesehen
work have I him seen
'I have seen him work'

[28] Holmberg (1999) presents data that prima facie speak against my conclusion. I reproduce them here.

(i) ?Kysst har jag inte Marit
kissed have I not Marit
(ii) Sett har jag inte den idioten
seen have I not the idiot (but I have talked with him on the phone)
(iii) Bo ska han i Malmö, men han ska jobba i Koppenhamn
live will he in Malmö, but he will work in Koppenhamn

4.3. *Conclusion*

Norwegian and Swedish are SVO languages. The CCD implies that if they have V-topicalization, they will exhibit double pronunciation of the sort observed in Hebrew and Vietnamese. As Norwegian and Swedish do not show double pronunciation, we expect them not to have V-topicalization. The goal of the previous subsection has been to argue that our expectation is not contradicted by facts.

Holmberg (1999: 11) notes that V-topicaliation "has not been discussed in the literature [...] in relation to the Scandinavian languages." While the abence of V-topicalization in the discussion of the Scandinavian languages might be an unfortunate fact, the reason for it might just be that V-topicalization is absent in these languages. In 1987, den Besten and Webelhuth observed that "[t]here is a sharp contrast between the Germanic SVO and SOV languages with respect to sentences where a nonfinite verb is topicalized together with (zero or) one of its objects, stranding (at least) one object." (Den Besten and Webelhuth 1987: 15). It turns out that the CCD could – to some extent – make sense of this observation. Here is how.

Suppose that Delete applies to reduce effort of pronunciation. Thus, Delete is part of Economy. Now let us say that languages differ with respect to how economical pronunciation must be. For concreteness, assume a parameter, [±dp], 'dp' being mnemonic for 'double pronunciation'. Languages which are [+dp] tolerate the pronunciation of both copies of (certain) chains, while those with [–dp] do not. We then deduce the following theorem from the CCD.

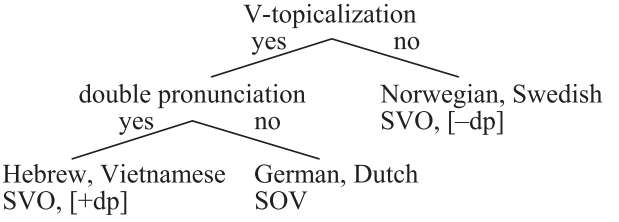
I have asked two other Swedish speakers about (i)–(iii). Both find (i) and (ii) to be bad, and one finds (i) to be 'very bad'. Of course, more careful testing is called for. But to the extent that Holmberg's judgments are correct, (i)–(iii) will have to find alternative explanations. I just want to note here that the contrast between (i) on the one hand and (ii) and (iii) on the other might be significant: the stranded arguments in (ii) and (iii) are of the types that are more likely to be able to undergo extraposition than the stranded object in (i). Thus, it might be the case that predicate fronting sentences in Swedish are good to the extent that the stranded arguments can evacuate the VP, which is what we predict. I hope to find out more in future research.

(69) V-topicalization Theorem (VTT)
If a language has V-topicalization, it is either SOV or [+dp]

If a language L is SVO and [–dp], it will not have V-topicalization, because if it did, it would have to pronounce both copies of (V, V), contradicting its [–dp] setting. Now let us say that Norwegian and Swedish are [–dp]. We then derive the fact that these languages do not have V-topicalization, because they are SVO languages.

The VTT also implies that if L has V-topicalization and is not SOV, L must be [+dp]. Thus, an SVO language will exhibit double pronunciation if it topicalizes the verb. Given that Hebrew and Vietnamese do topicalize the verb, we correctly predict that the topicalized verb is pronounced twice in these languages. Finally, the fact that German and Dutch do not show double pronunciation of the fronted V follows from CCD and the fact that these languages are SOV.[29] Now recall the typology in (9), repeated here in (70). Note that den Besten and Webelhuth's (1987) observation is reflected in (70): among the Germanic languages, the SVO ones have V-topicalization, while the SOV ones do not.

(70)



While I do not fully explain (70), I do derive three quarter of it. Specifically, my theory predicts which languages cannot have V-topicalization, and for languages that do have V-topicalization, it predicts which ones of them show double pronunciation of the topicalized verb. Thus, the highest 'yes' in (70) is not accounted for, but every other aspect of (70) is.

[29] And the assumption that Delete must apply when it can. The facts we have observed are compatible with German and Dutch being either [+dp] or [–dp]. However, we will see in section 6 that there are reasons to assume the [–dp] setting for these languages.

5. NP-split in Vietnamese

5.1. *Optionality of double pronunciation*

In Vietnamese, nouns cannot combine with a numeral without the mediation of a classifier.

(71) a. *toi mua mot sach ve vat-ly
I buy one book about physics
b. toi mua mot quyen sach ve vat-ly
I buy one CL book about physics
'I bought a book about physics'

The N head can topicalize, stranding the classifier and other elements of the DP behind. Curiously, double pronunciation of N is optional, even though NP is head-initial.

(72) sach thi toi mua mot quyen (sach) ve vat-ly
book TOP I buy one CL (book) about physics
'As for books, I bought a one about physics'

Our proposal actually predicts this fact. To see this, a brief excursion into the semantics of classifiers and nouns in Vietnamese is needed.

5.2. *Chierchia (1998)*

In his (1998) paper, Chierchia proposes an explanation for the difference between classifier languages such as Chinese and Vietnamese and languages such as English and German. First, he assumes that the domain of individuals include both atomic and plural entities. For non-classifier languages, a singular count noun such as *book* denotes the set of atomic books, while a plural count noun such as *book-s* denote the set of pluralities of books.[30]

[30] The meaning of the plural morpheme [-s] is $\lambda P \lambda x[\neg Px \wedge \forall y[y \subseteq x \rightarrow Py]]$. Basically, it is a function from a predicate P and to a set of individuals which do not fall under P but which have proper parts that do. This means that if [[*-s*]] combines with [[*dog-s*]] or [[*dog-s*]] $\cup$ [[*dog*]], the result is always $\varnothing$. Chierchia takes this to be a welcome result, since pluralization of plural and mass nouns is indeed ungrammatical.

(73)
a+b+c a+b b+c c+d	= [[*book-s*]]
a b c	= [[*book*]]

The meaning of a mass noun such as *furniture*, however, is the set containing both singular and plural pieces of furniture.

(74)
a+b+c a+b b+c c+d a b c	= [[*furniture*]]

As numerals require their arguments to be sets of atoms, *three furniture* is predicted to be bad.[31] Chierchia then proposes that all nouns in classifier languages are like *furniture* in English. The noun *sach* in Vietnamese, for example, has in its extension both singular books and pluralities of books. It follows that *sach* cannot combine directly with a numeral. The function of the classifier *quyen*, then, is to turn [[*sach*]] into [[*book*]].

(75) $[[\text{CL}]] = [\lambda P.\lambda x.P(x) \wedge \text{atomic}(x)]$

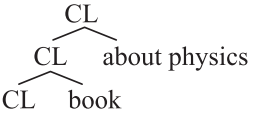
The classifier takes a predicate P and returns the set of atomic entities in the extension of P. Thus, [[*sach*]] = [[*book*]] ∪ [[*book-s*]], and [[*quyen sach*]] = [[*book*]].

5.3. *Explaining optionality of double pronunciation*

Chierchia's semantics predicts that the string *quyen sach ve vat-ly* (*CL book about physics*) can have two analyses which are equivalent in meaning. (We will assume bare phrase structure (Chomsky 1994, 1995). Also, I will use the English gloss in the text to represent the corresponding Vietnamese words when no confusion arises.)

[31] The plural morpheme in [*three dogs*] is assumed to be a purely syntactic reflex.

(76) a.


b.


Semantically, both structures amount to intersecting the set of books, the set of atoms and the set of things about physics. In other word, the equation in (77) holds.

(77) [[(76a)]] = [[(76b)]] = the set of atomic books about physics

Now note that *book* in (76a) is not an XP, because it projects. On the other hand, *book* in (76b) is an XP, because it does not project (Chomsky 1994: 396, 1995: 241–249). This means that if *book* is fronted from (76a), the result is (78a): the chain (*book*, *book*) will not be deletable, since its lower member does not end an XP. However, if *book* is fronted from (76b), the resulting chain will be deletable, since it will be an NP that fronts (cf. (78b)).

(78) a. *book* … *book about physics*]$_{XP}$

b. *book* … *book*]$_{XP}$ *about physics*]$_{XP}$

Both (76a) and (76b) are semantically coherent. Thus, both are possible. The optionality of double pronunciation then comes about through the existence of two semantically equivalent structures, one prohibits double pronunciation and one requires it.

5.4. *Deriving other facts*

The explanation just given for the optionality of double pronunciation turns out to account for several other facts about NP-split in Vietnamese. The first one is this: when the only sister of the noun is the classifier, double pronunciation substantially degrades the sentence.

(79) a. sach thi toi doc mot quyen
book TOP I buy one CL
b. *?sach thi toi doc mot quyen sach
book TOP I read one CL sach
'As for books, I read one'

This fact follows from the assumption that Delete is obligatory, i.e. that it must apply when it can. If the only sister of *book* is CL, *book* will be an XP, since it does not project. Fronting it will create a chain CH to which Delete can apply. Thus, Delete must apply to CH. (79b) is bad because Delete fails to apply when it can.

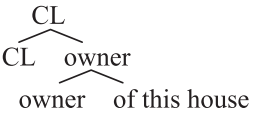
Here is another fact that we predict. If instead of a non-relational noun like *book* and a PP modifier like *about physics*, we have a relational noun like *owner* and a PP complement like *of this house*, topicalizing N requires double pronunciation. Failure to repeat the lower N copy results in severe degradedness.[32]

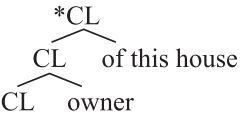
(80) a. toi da gap mot nguoi chu cua cai nha nay
I PERF met one CL owner of CL house this
b. chu thi toi da gap mot nguoi *(chu) cua cai
owner TOP I PERF met one CL *(owner) of CL
nha nay
house this
'I have met an owner of this house'

We can explain this fact as follows. The noun *owner* is a relational noun. Thus, it is of type ⟨e,et⟩. As classifiers are of type ⟨et,et⟩, *owner* cannot combine with a classifier without first combining with an expression of type e. In other words, (81a) is interpretable, but (81b) is not, since it contains a type mismatch.

[32] I thank Noam Chomsky for drawing my attention to this consequence of my assumptions. Note that *sach* 'book' and *ve vat-ly* 'about physics' and be separated by another modifer, while *chu* 'owner' and *cua cai nha nay* 'of this house' cannot.

(i) a. mot quyen sach mau-do ve vat-ly
one CL book red about physics
b. *mot nguoi chu tu New York cua cai nha nay
one CL owner from New York of CL house this

(81) a.


b.


Because *owner* in (81a) is not an XP, fronting it requires double pronunciation. Since only (81a) is interpretable, double pronunciation is obligatory when *owner* is fronted.

Another fact that we explain has to do with measure words. In addition to classifiers, words like *can* 'kilogram' or *thung* 'box' can also mediate between nouns and numerals.

(82) toi mua mot thung sach
I buy one box book
'I bought a box of books'

Chierchia (1998) did not discuss measure words. Trinh (2007) proposes that a class of nouns – the container nouns – in classifier languages are systematically ambiguous between a regular meaning and a 'measure word' meaning. For example, *thung* is ambiguous between (83a) and (83b).

(83) a. [[*thung*]] = [λx.x is an atomic box or a plurality of boxes]
b. [[*thung*]] = [λP.λx.x is an atomic box & [∀y.x contains y → P(y)]]

In its measure word meaning, *thung* denotes a function from a predicate P to the set of atomic boxes containing things which fall under P. Given this assumption, we have the following meaning for *thung sach*.

(84) [[*thung sach*]] = the set of atomic boxes containing books

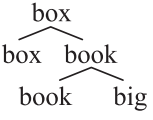
Now consider the following paradigm.

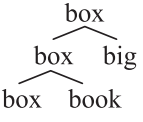
(85) a. toi mua mot thung sach to
I buy one box book big
'I bought a big box of books' / 'I bought a box of big books'

b. sach thi toi mua mot thung sach to
book TOP I buy one box book big
'As for books, I bought a big box of books' / 'As for books, I bought a box of big books'

c. sach thi toi mua mot thung to
book TOP I buy one box big
'As for books, I bought a big box of books' / *'As for books, I bought a box of big books'

Both (85a) and (85b) are ambiguous with respect to the interpretation of the object DP: the adjective *big* can be construed as modifying *box* or as modifying *book*. However, (85c) is not ambiguous in the same way: *big* can only be understood as a modifier of *box*. This is exactly what we predict. Consider the two possible structures for *box book big*.

(86) a.


b.


The following meanings are given to (86a) and (86b) by our semantics.

(87) a. [[(86a)]] = the set of atomic boxes containing big books
b. [[(86b)]] = the set of big atomic boxes containing books

If we front *book* and leave a gap at the base position, as in (85c), the underlying structure must be (86b), but then *big* has to modify *box*, not *book*. This is what is observed.

6. Head-adjunction

6.1. *The problem*

Head-adjunction poses a problem for the CCD: irrespective of whether the lower copy ends an XP or not, there is never double pronunciation. For example, we have seen that when V moves to [Spec,C] in Hebrew,

both the topic and the base position are pronounced (cf. (88a)). However, if V moves to T, V is pronounced only once (cf. (88b)).

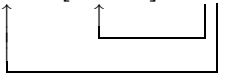
(88) a. liknot Rina kiva liknot et ha-sefer
buy.INF Rina hoped buy.INF ACC the-book
'As for buying, Rina hoped to buy the book'
b. Rina kanta et ha-sefer
Rina bought ACC the-book
'Rina bought the book'

In fact, Hebrew provides an even more dramatic illustration of the problem. This language allows the topicalized infinitive to be doubled by a tensed form.

(89) liknot hi kanta et ha-praxim
buy.INF she bought ACC the-flowers
'As for buying, she bought the flowers'

Landau (2006) analyzes this construction as involving parallel chains: the head of VP is the lower copy of two different chains, one created by V-topicalization and one created by V-to-T raising (Landau 2006).

(90) V . . . [$_T$ V+T] . . . ~~V~~ object



For both chains, only the higher copy gets pronounced. The head of VP is deleted, even though it is the lower copy of an undeletable chain, i.e. the chain created by V-topicalization. This means that being the lower copy of a head-adjunction chain automatically entails being phonologically deleted. The lower copy of a head-adjunction chain behaves as it is not there at all, so to speak.

We could end the paper here with the usual concession that head-to-head movement is just different. However, I will tentatively offer two possible ways to tackle the problem, and will let the reader decide which of them is better.

6.2. *Hypothesis 1*

Suppose we say that Delete cares about both the higher and the lower copy of the chain to which it applies. More precisely, suppose Delete ap-

plies to CH = (α, β) only if the two members of CH stand in the following relation: if α ends an XP, then β does too. Call this the Implicational Constraint on Copy Deletion (ICCD). It follows from the ICCD that if α does not end a phonological phrase, then (α, β) is deletable. We can now account for the fact that head-adjunction always results in deletable chains by saying that adjoined heads never ends an XP. This statement, in turn, is derivable from two assumptions, each of which have been independently made in the literature. The first says that adjoined heads are not XPs, even though they do not project (cf. Chomsky 1994: 408–409), and the second says that head-adjunction is left-adjunction (cf. Baker 1988). Thus, adjunction of H to α results in (91), where H is by definition not an XP.

(91) 

H cannot be at the right edge of an XP: it is not an XP, and it is followed by α which is the head it adjoins to. This holds regardless of the headedness of αP. Thus, any chain whose higher copy is H will be deletable, whether α is at the right edge of αP or not. This is why V-to-T movement in both German and Hebrew results in deletable chains, even though TP is head-final in German and head-initial in Hebrew.

As for 'parallel chains', suppose we say that α will fail to be pronounced if there is one deletion process which applies to α. The shared member of the chain CH created by Ā-movement of V to [Spec,C] and and the chain CH′ created by adjunction of V to T fails to be overt because Delete applies to CH.[33]

Note that this solution does not affect anything that was said about either V-topicalization or N-topicalization. Topicalization is movement to [Spec,C], and specifiers are by definition XPs. If the higher copy of (α, β) is an XP, then whether (α, β) is deletable will depend wholly on whether β ends an XP. In other word, in a universe of discourse where all higher copies are specifiers, the CCD and the ICCD will be equivalent. The discussion in sections 1 to 5 was carried out in such a universe of discourse.

[33] In a sense, this is a natural assumption. Take VP-ellipsis for instance. The VP is not the lower member of any (non-trivial) chain, so it cannot be erased by Delete. But since there is another deletion rule, say Elide, which applies to VP, it is deleted.

One question is left open: why does Hebrew have parallel chains, while German – or any of the other languages we have discussed – does not? In other word, what prevents German from generating (92) by raising V to T, raising T to C, and fronting V from inside the VP to [Spec,C], as in (93).

(92) *lesen liest Hans Bücher
read.INF read.3SG Hans books
('As for reading, Hans reads books')

(93) a. V-to-T raising
$[_T$ V T] . . . ~~V~~ . . .

b. T-to-C raising
$[_C$ C $[_T$ V T]] . . . ~~$[_T$ V T]~~ . . . ~~V~~ . . .

c. V-topicalization
V $[_C$ C $[_T$ V T]] . . . $[_T$ V T] . . . ~~V~~ . . .

We can answer this question by stipulating another parameter, [±pc], 'pc' being mnemonic for 'parallel chains'. Languages that are [+pc] allows (certain) chains to share (lower) members, while those that are [−pc] do not. Hebrew is [+pc], while German, Dutch, Norwegian and Swedish is [−pc].[34]

(94)


This parameter captures the facts, but it does that by restating them. Its ad hoc nature becomes more conspicuous when we move beyond the languages we have discussed. Consider Yiddish and Spanish. Both are similar to Hebrew in that they are [+pc]: they allow doubling of the topicalized verb by a tensed form.

[34] Vietnamese does not have V-to-T movement, so we cannot tell whether it is [+pc] or not. It will be irrelevant for this part of the discussion.

(95) Yiddish is [+pc] (Cable 2004: 2)
Essen est Maks fish
eat.INF eat.3SG Maks fish
'As for eating, Maks eats fish'

(96) Spanish is [+pc] (Vicente 2007: 62)
conducir, Juan condujo un camion
drive.INF Juan drive.3SG a truck
'As for driving, Juan drove a truck'

But it turns out that Yiddish and Spanish are similar to Hebrew in yet another respect: both are [+dp]. Like Hebrew, Yiddish and Spanish pronounce both copies of the chain created by V-topicalization.

(97) Yiddish is [+dp] (Cable 2004: 2)
gegessen hot Maks gegessen fish
eaten has Makx eaten fish
'As for having eaten, Maks has eaten fish'

(98) Spanish is [+dp] (Vicente 2007: 7)
jugar, Juan suele jugar al futbol
play.INF Juan HAB.3SG play.INF at football
los domingos
the Sundays
'As for playing, Juan usually plays football on Sundays'

Thus, the languages which allow doubling of the infinitival verb in [Spec,C] by a tensed form turns out to be exactly those which allow doubling of the infinitival verb in [Spec,C] by an infinitival form. This means that [±pc] makes the same cut as [±dp] for Hebrew, Spanish, Yiddish, Norwegian and Swedish. The first three are [+pc] and [+dp], while the last two are [−pc] and [−dp]. As for German and Dutch, the facts are compatible with these languages being either [+dp] or [−dp]. Suppose they are [−dp]. Then [±pc] makes the exact same cut as [±dp] for <u>all</u> the languages we have seen. However, [±pc] and [±dp] are logically independent: a language could very well permit two chains to share the lower member, while disallow the pronunciation of both copies of any chain, or it could disallow parallel chains while requiring double pronunciation. In other word, [+pc, −dp] and [−pc, +dp] are perfectly coherent settings.

That there are (seemingly) no languages with these settings indicates that a generalization is being missed.

6.3. *Hypothesis 2*

Suppose we say that head-adjunction – or at least V-to-T movement – simply does not create any chain (α, β).[35] Moving V to T is literally moving V to T. Schematically:

(99) V-to-T movement
$X - T - Y - V - Z \quad \rightarrow \quad X - [_T\ V\ T] - Y - Z$

The lack of double pronunciation in head-adjunction automatically follows: the lower copy is not pronounced because there is no lower copy!

This solution enables us to get rid of [±pc]: doubling of the topicalized verb by a tensed form is just double pronunciation of the chain (V, V) created by V-topicalization, with the lower V copy adjoined to T. 'Parallel chain' sentences such as (95) and (96) are derived with the following steps.

(100) a. V-topicalization
V … T … **V** …
↑ ⌊ ⌋ → chain created = (*V*, *V*)

b. Adjunction of the lower V copy to T
V … [$_T$ **V** T] …
↑ ⌊ ⌋ → no chain created

Thus, there are no 'parallel chains'. There is only one chain whose higher copy is in [Spec,C] and whose lower copy is a subpart of another word, namely [$_T$ V T]. Note that the V in [$_T$ V T] cannot be deleted. The reason is that V adjoins to T only if T is affixal, and if T is affixal, it cannot be pronounced alone (cf. the Stranded Affix Filter (Lasnik 1981)). It follows that the step in (100b) is only possible in languages which allow the lower copy of (V, V) to be pronounced, i.e. only in [+dp] languages. A [−dp] language will not allow the lower copy of (V, V) to adjoin to T, because

[35] I thank Noam Chomsky for suggesting this solution to me.

then both copies of (V, V) will have to be overtly realized, contradicting the [−dp] setting. We thus derive the fact that the [+dp] languages (Hebrew, Spanish, Yiddish) allow 'parallel chains' and the [−dp] ones (German, Dutch, Norwegian, Swedish) do not, without postulating another parameter.

Assuming that head-adjunction does not leave a copy accounts for the facts in a simple way. However, the output of head-adjunction cannot feed semantic interpretation if head-adjunction leaves no copy. This means that head-adjunction must be a morphological or phonological operation, applying after spell out on the PF branch of the derivation. The proposal that head-adjunction is a PF-operation has been made several times in the theoretical literature (cf. Boeckx and Stjepanovich 2001, Chomsky 1995, Chomsky 2000, Freidin 1999, Lasnik 1999, among others). Grodzinsky and Finkel (1998) provides experimental results supporting the conclusion that head-adjunction does not create a chain.[36] The considerarions above constitute additional evidence in favor of this view.

7. Conclusion and further work

We have examined predicate fronting in German, Dutch, Hebrew, Vietnamese, Norwegian and Swedish. We have also looked at NP-split in Vietnamese. The phenomena all involve a solitary X° appearing in the clause-initial topic position, i.e. [Spec,C]. We have seen that an array of facts about both pronunciation and semantic interpretation can be derived from a constraint on chain linearization, the CCD, in conjunction with previous proposals on phrase structure (Chomsky 1994, 1995 Chapter 4) and semantics of nouns and classifiers (Chierchia 1998). The CCD says that deletion of the lower copy of a chain is possible only if that copy ends an XP.

Head-adjunction constitutes a prima facie counterexample to the CCD. I proposed two tentative solutions. The first one involves minimal

[36] For empirical and conceptual arguments that head-adjunction is part of narrow syntax, see Gergel (2005), Lechner (2005), Matushansky (2006), Vicente (2007).

revision of the CCD, the second requires the assumption that head-adjunction is post-syntactic.

I will end the paper with a brief discussion of two issues. The first concerns Chomsky's Chain Uniformity condition (cf. Chomsky 1994, 1995 chapter 4). This principle requires all members of a chain to have the same 'phrase structural status'. Thus, a chain CH = (α, β) would be well-formed only if α and β are identical with respect to being an XP and being an X°. Chains whose higher copy is an XP but whose lower copy is not would be ruled out. In this paper, we have seen evidence that Chain Uniformity does not exist, i.e. that it is possible to raise a non-maximal projection to a specifier position. Perhaps more significantly, we might have an answer as to why Chain Uniformity was thought to exist in the first place. Chain Uniformity was formulated as part of the attempt to preserve the empirical predictions of the Structure Preserving Hypothesis (SPH), which was proposed by Emonds (1964) and which has become unformulable in the minimalist framework (cf. Chomsky 1994: 404–405). The SPH, in turn, was arrived at 'from a study of English transformations' (Emonds 1964: 11). English is an SVO language. Suppose it is [−dp], like the other Germanic languages discussed in sections 3 and 4. We then predict – given standard assumptions – that every syntactic movement in English will result in an uniform chain. A non-uniform chain can only be generated by moving a head to a specifier position. However, because English is head-initial, a non-uniform chain would not be able to undergo Delete, forcing double pronunciation and contradicting the [−dp] setting. Thus, Chain Uniformity turns out to be a descriptive generalization about languages which are head-initial and [−dp] like English. It is falsified when SOV languages like German and Dutch or [+dp] languages like Hebrew and Vietnamese are considered.

The second issue concerns the nature of the CCD. This condition refers to the right edge of maximal projections. Reference to edges of syntactic constituents of designated types in the X-bar hierarchy is a distinctive property of syntax-phonology mapping rules (Selkirk 1984, 1986, Chen 1985, Hale and Selkirk 1987, Truckenbrodt 1995). Thus, it has been proposed that phonological phrases are constructed from 'surface structure' according to either (101a) or (101b), with languages differing in whether one or the other is chosen.

(101) a. Align(XP,R)
Align the right edge of every XP with the right edge of a phonological phrase
b. Align(XP,L)
Align the left edge of every XP with the left edge of a phonological phrase

Suppose all the languages we have looked at choose Align(XP,R), and that the notion *surface structure* – which is the input to Align(XP,R) – is to have a 'minimalist' meaning: it would simply be the output of overt syntax, i.e. the object occupying the derivational workspace at the point of spell-out. Then we can replace the CCD by (102).

(102) Prosodic Constraint on Copy Deletion (PCCD)
(α, β) is deletable only if β ends a phonological phrase

In other word, the phonetic material which is to be erased by Delete must be followed by a phonological phrase boundary. The order of operation will then be (103).

(103) Output of overt syntax → Align(XP,R) → Delete → Prosodic structure → further rules of phonology and phonetics

Align(XP,R) applies to the output of overt syntax. Consequently, the input to Align(XP,R) contains copies created by syntactic movement. The output of Align(XP,R) is then the input to Delete, and the output of Delete is approximately what is called 'prosodic structure' in the works cited above.[37]

If the PCCD turns out to be correct, we have crucial evidence that copy deletion, and more generally chain linearization, is part of the syntax-phonology mapping (cf. Fox and Pesetsky 2005, Chomsky 1995). It is beyond the scope of this paper to verify the PCCD, and I will leave the task to future research. However, I will note that a cursory look at Japanese

[37] However, the 'prosodic structure' in (103) is more abstract and remote from actual pronunciation. It undergoes further rules, possibly rules of phonology and definitely the mostly optional, tempo-sensitive, quantitative and gradient rules of phonetic implementation. Thus, phonological phrase boundaries, which are constructed mechanically by Align(XP,R), could be erased in subsequent steps of the derivation, and an XP could end up being pronounced like a head, for example.

offers an encouraging starting point. This language is head-final. Thus, it is similar to German and Dutch in that V is at the end of VP. However, it lacks V-topicalization (Yasutada Sudo p.c., Shigeru Miyagawa p.c.). If grammar contains the CCD instead of the PCCD, this fact cannot be explained by anything that has been said sofar. Given the CCD, the [±dp] parameter does not play any role for a head-final language. But if grammar contains the PCCD rather than the CCD, we can set Japanese to [−dp] and derive the absence of V-topicalization from the independently established fact that this language aligns the left edges of phonological phrases with the left edges of XPs (Selkirk and Tateishi 1991). In other word, German and Japanese would be a minimal pair. Both are head-final and [−dp]. They differ only in that German chooses Align(XP,R) while Japanese chooses Align(XP,L). This parametric difference would explain why V-topicalization is possible in the former and impossible in the latter.[38]

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[38] Norvin Richards (p.c.) pointed out to me that (102) predicts that movement of XPs in Japanese creates undeletable chains, which is empirically false. We may fix (102) by parameterizing it as in (i), thus making it look more similar to Selkirk's rule.

(i) Prosodic Constraint on Copy Deletion
   a. (α, β) is deletable only if β ends (i.e. is at the right edge of) a phonological phrase
   b. (α, β) is deletable only if β begins (i.e. is at the left edge of) a phonological phrase

Japanese would then be a language which chooses (101b) and (i-b). It might be that languages which choose (101a) choose (ia), and those that choose (101b) choose (ib). This would mean that only the kind of edges generated by the syntax-phonology mapping rule of a language is relevant for the rule of copy deletion in that language: languages which generate left edges of phonological phrases (i.e. choose (101b)) would refer only to left edges of these phrases in their rule for copy deletion, and similarly for languages which generate right edges of phonological phrases (choose (101a)). Obviously, more empirical work need to be done. I thank Norvin Richards for pointing out this issue.

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