Chain Resolution in Hebrew V(P)-fronting

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## 1.	Introduction

This article is an attempt to deepen our understanding of a domain where the shift to "interface-driven syntax" has already made some non-trivial progress: The resolution of chains at the interfaces.

Chomsky's (1995) proposal that chains are formed by copying an element, merging the new copy in a higher position and deleting the redundant copy, provided a new framework for looking at various syntactic phenomena. Another guiding intuition is that when possible, maximal explanatory burden should be shifted to the interfaces. Consider in this light the question of chain resolution: which copy gets to be interpreted at LF, and which to be pronounced at PF. It is conceivable that "narrow syntax" has a say on these matters; that syntactic operations affect, or even determine, how chains are pronounced and interpreted. Yet clearly this state of affairs would be suboptimal from a minimalist point of view, and should be avoided, if possible. Let us state this desideratum as follows.

(1)	*Post-Syntactic Chain Resolution (PSCR)*
	The decision which chain copy to pronounce or interpret is solely determined
	at the interfaces.

On the PF side, the PSCR is explicitly defended in Pesetsky (1998), Franks (1998, 1999), Bošković (2001), Bobaljik (2002) and others.

The PSCR leaves open the question of how the PF/LF interfaces decide which copy to pronounce/interpret. Here there are many proposals, yet again, general constraints may be pursued. One natural question is – how autonomous are the interfaces in resolving chains? In particular, is the choice at the PF side affected by the choice on the LF side, and vice versa? Notice that such cross-interface dependence is at odds with a central tenet of modern cognitive science, namely, the *modularity* hypothesis. Again, if possible, it should be avoided, a desideratum we can state as follows.

(2)   *Modular Chain Resolution (MCR)*
        The decision which chain copy to pronounce/interpret is locally determined
        at PF/LF, respectively.

The MCR is a stronger version of PSCR, entailing but not entailed by the latter. Unlike the PSCR, the MCR is not explicitly upheld by many authors, although, as mentioned, it accords well with current understanding of cognitive systems.

There are obvious challenges to MCR within current research. One important challenge is the constraint on recoverability of deletion (RoD), which appears to make PF deletion contingent on LF recoverability. Notice that such a statement is at odds with the MCR. Allowing LF information to be accessible to PF choices is precisely what it barred by MCR. I believe that the undeniably correct intuition behind RoD constraints can be given an MCR-compatible form (by restating them as interpretive constraints), although I will not attempt this in this paper.

A second challenge to MCR has to do with preference principles favoring identical choices at PF and LF. Two recent formulations are given below.

(3)   a.   *ParseScope* (Fanselow & Ćavar 2001)
                If α has scope over β then the phonetic matrix of α c-commands the
                phonetic matrix of β.

        b.   *Minimize Mismatch* (Bobaljik 2002)
                (To the extent possible) privilege the same copy at PF and LF.

These preference principles have an obvious functionalist rationale: they guarantee that semantic scope relations will be read off surface structures – whenever possible. However, this preference can be overridden to avoid a violation of a PF requirement, resulting in non-transparent scope. Again, we may accept this rationale as a design feature of the computational system, while denying its causal role in specific derivations. Notice that Minimize Mismatch principles presuppose a syntax-external "scanner", capable of comparing the positions of the PF-copy and the LF-copy, and in fact backfeeding into the algorithm selecting those copies. This is clearly inconsistent with the MCR, so the question arises again – can the empirical results of these principles be captured by an alternative, MCR-compatible account?

The phenomenon studied in this paper is VP-fronting in Hebrew. This construction offers particular insight into issues of chain resolution due to the fact that two chain positions are visible at PF: The verb is doubled, occurring both in the base position and in the fronted one. Thus, the construction invites an investigation of the factors requiring, allowing or excluding the phonetic expression of chain copies.

The structure of this paper is as follows. Section 2 provides a general description of the VP-fronting construction – morphology, syntax and pragmatics. Section 3 demonstrates that the dependency between the fronted and the base verbal copies is island-sensitive, hence formed by movement. Section 4 investigates more closely the properties of the doubled verb. Section 4.1 shows that the copied element is already a verb (light v + root), while section 4.2 argues that when stranding its arguments, the fronted category is a bare V (rather than a remnant VP). Section 5 develops a PF-algorithm for chain resolution,

consisting of a P(honological)-recoverability constraint, interacting with economy preferences. The algorithm is consistent with the MCR and accounts for the obligatory spellout of the two verbal copies. Section 6 concludes the paper.

2.   General Description of V(P)-fronting in Hebrew

Unlike in English, Hebrew has no *do*-support strategy to spell out tense and agreement features when the VP is moved (or elided). Instead, the verb is spelled out both in T^0 and in the fronted VP, giving rise to V-copying. While the low verbal copy is fully inflected, the higher one is an infinitive.[1] An internal argument may either front with the verb or be stranded. I will call the former option Phrasal-Infinitive fronting (*PI-fronting*) and the latter one Bare-Infinitive fronting (*BI-fronting*).

(4)   *PI-fronting*
         a.   liknot   et   ha-praxim,   hi   kanta.
                 to-buy ACC. the-flowers, she bought
         BI-fronting
         b.   liknot, hi   kanta   et   ha-praxim.
                 to-buy she bought ACC. the-flowers
                 'Buy the flowers, she did'

The alternation between the two fronting options is pragmatic (see below). I will assume that the fronted category occupies some topic position.[2]
         The identity of the fronted category in BI-fronting is a matter of some debate; for now I put it aside and return to the issue in section 4.2.. As to PI-fronting, despite the infinitival morphology, which might suggest a clausal projection, it can be shown that the initial infinitive is a bare VP. Negation and sentential adverbs are strictly forbidden in the initial position (see also Ziv 1997, Doron 1999):

(5)   a.   le'horid et   ha-maym, Gil lo   tamid morid.
                 to-flush ACC. the-water   Gil not always flushes
                 'Flush the toilet, Gil not always does'

         b.   (*lo) (*tamid)   le'horid et   ha-maym, Gil morid.
                 (*not) (*always) to-flush ACC. the-water   Gil flushes

Thus, the initial infinitive in (6) is a bare VP (we return in section 4.1 to the source of the infinitival morphology), which may contain only the verb and its arguments.
         As to the phonology of the construction, the relevant aspect is intonation. Here I will limit myself to the most basic observations. The most salient intonational feature of VP-fronting is the high pitch accent on the stressed syllable of the (infinitival) fronted

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[1] Many languages employ V-copying in VP-fronting, e.g., Haitian, Vata, Yoruba, Brazilian Portuguese, Yiddish and Russian. The last three, like Hebrew, realize the higher V-copy as an infinitive.
[2] In this paper I ignore more complex options available with ditransitive verbs, e.g., fronting one argument and stranding the other one; see Landau (2004).

verb. In normal circumstances (when nothing else inside the fronted VP is focused), this high tone will be followed by a plateau of a low phrase accent. If the fronted VP forms its own intonational phrase (i.e., when separated from the sentence by a perceptible pause), it will end with a high boundary tone; otherwise, the low plateau will stretch into the sentence. This is roughly illustrated below.

(7)　　　H* L⁻　　(H%)
　　　likRO   et   ha-sefer, Gil kara.
　　　to-read ACC. the-book Gil read
　　　'Read the book, Gil did'

The infinitival verb must coincide with the left boundary of its intonational phrase. Left-adjoined VP-adverbs, even when monosyllabic and destressed, may not front with the VP.

(8)　　　(*kvar)   lištof   et   ha-kelim hu (kvar)   šataf.
　　　(*already) to-wash ACC. the-dishes he (already) washed.
　　　'Wash the dishes, he already did'

For Hebrew, then, the following requirement holds at PF.

(9)　　In Hebrew VP-fronting, the fronted (infinitival) verb bears high pitch accent (on its stressed syllable) and coincides with the left boundary of its intonational phrase.

Pragmatically, V-copying constructions across languages seem to fall into two categories: Topicalization and cleft. The predicate cleft construction, attested in African and Caribbean Creole languages, is consistently associated with a contrastive focus interpretation. The topicalization construction, attested in Hebrew, Yiddish and Portuguese, is pragmatically more open, allowing simple topic and (possibly, in Hebrew) a focus interpretation. This pragmatic difference correlates with a syntactic one – the predicate cleft construction is biclausal (constructed with a copula) whereas the topicalization construction is monoclausal.

Most commonly, VP-fronting in Hebrew marks a Topic or contrastive Focus. The new information could be either a certain constituent in the clause, or the affirmation/negation of that clause.[3] Stress placement serves to mark that information.

(10)　a.　le-Rina yeš   xuš   humor, aval licxok   hi coxeket rak al axeRIM.
　　　　to-Rina there-is sense humor but to-laugh she laughs only on others
　　　　'Rina has a sense of humor, but she will only laugh at *others*'

　　　b.　le-Rina yeš   xuš   humor, aval licxok   al acma hi LO ticxak.
　　　　to-Rina there-is sense humor but to-laugh on herself she not will-laugh
　　　　'Rina has a sense of humor, but laugh at herself – she *won't*"

[3] The pragmatics of the construction is very similar in Yiddish (Källgren & Prince 1989) and Russian (Abels 2001).

In both (10a,b), the fronted infinitive is interpreted contrastively (the occurrence of *aval* 'but' before VP-fronting is very common). In (10a) *axerim* 'others' is in focus while in (10b) the entire negative proposition *hi lo ticxak* 'she won't laugh' is focused. Notice that the contrastive focus is 'to laugh' in (10a) but 'to laugh at herself' in (10b). In other words, the choice between BI- and PI-fronting crucially affects the topic/contrastive focus of the sentence. In fact – as I will argue below, this pragmatic effect is the *only* aspect of meaning which distinguishes the two constructions.

BI-fronting is ruled out with auxiliary verbs, a fact observed in all languages with V(P)-topicalization or predicate cleft. I follow Davis & Prince (1986) in tracing this restriction to the requirement that the Topic bear semantic content. Although the lower copy of the auxiliary verb is associated with Tense, the higher copy is not, given that the fronted category is V(P). The result of topicalizing an auxiliary verb is pragmatically uninterpretable.

(11)   a.   lihyot zamin,   Gil lo tamid   haya.
             to-be available Gil not always was

       b.   *lihyot, Gil lo   tamid   haya zamin.
             to-be Gil not always was available
             'To be available, Gil wasn't always'

3.   Evidence for A-bar movement

We have already seen that the initial infinitive heads a category no bigger than a VP. In this section I will show that the relation between the higher and the lower VP positions is formed by A-bar movement. Importantly, the characteristics of A-bar movement show up regardless of whether the initial infinitive is phrasal or bare.

First, observe that the dependency is unbounded, and in particular, can cross finite clause boundaries, a hallmark of A-bar dependencies:

(12)   a.   la'azor, eyn   li   safek še-Gil hivtiax še-hu ya'azor le-Rina.
             to-help there-isn't to-me doubt that-Gil promised that-he will-help to-Rina
             'Help Rina, I have no doubt that Gil promised he will'

       b.   lenakot et   ha-xacer, nidme li   še-Rina amra še-Gil   kvar   nika.
             to-clean ACC. the-yard seems to-me that-Rina said that-Gil already cleaned
             'Clean the yard, it seems to me that Rina said that Gil already had'

However, the dependency is island sensitive.

(13)   *Wh-island*
       a.   ?? likro, ša'alti   matay Gil kvar   kara et   ha-sefer.
             to-read asked.1sg when   Gil already read ACC. the-book
             'Read the book, I asked when Gil already had'

Complex NP island
b. * likro   et   ha-sefer, Gil daxa   et   ha-te'ana še-hu kvar   kara.
       to-read ACC. the-book Gil rejected ACC. the-claim that-he already read
       'Read the book, Gil rejected the claim that he already had'

Subject island
c. * likro   et   ha-sefer, še-yevakšu   me-Gil še-yikra   ze ma'aliv.
       to-read ACC. the-book that-will-ask.3pl from-Gil that-will-read.3sg it insulting
       'Read the book, that they would ask Gil to is insulting'

Adjunct island
d. * likro, nifgašnu axarey še-kulam   kar'u   et   ha-sefer.
       to-read met.1pl after   that-everybody read.3pl ACC. the-book
       'Read the book, we have met after everybody did'

The data in of (12)-(13) clearly indicate that the dependency between the initial (infinitival) VP and its copy downstairs is formed by A-bar movement. In other words, we are looking at an instance of *VP-fronting*.[4]

4.   Doubling V

A question naturally arises at this point: Why are two phonological copies of the verb spelled out? Normal cases of movement are known to leave unpronounced copies ("traces"). Furthermore, why does the fronted copy show up as an infinitive, and not as an identical, inflected verb? A third puzzle is raised by (12a), where the fronted element appears to be the bare verb. If appearance is reliable, the initial infinitive in these examples is a syntactic head; yet the data suggest that this head is related to its lower copy by A-bar movement. How can movement of a head, which is supposed to be subject to strict locality, apply in an unbounded fashion? Let us address the second question first – the infinitival morphology on the fronted verb – and then turn to the other two questions.

4.1.   Root or Category Copying?

Following recent work, I will assume that the predicate phrase is headed by a light v. On this view, lexical verbs are the product of a syntactic fusion (following head-to-head movement) between some "core" or root V ($\sqrt{V}$) and a functional light v, the latter encoding properties like voice, transitivity and agentivity (Hale & Keyser 1993, Chomsky 1995, Kratzer 1996, Marantz 1997, Doron 2003). I will also adopt the stronger thesis, put forward in Marantz (1997) and subsequent work in Distributed Morphology, that the root is category neutral, and light v provides the categorial feature [+V].

If $\sqrt{V}$ and v project distinct syntactic categories, the question immediately arises which of these categories is targeted in the PI-fronting construction.[5] Considerations

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[4] These data refute the view of Ziv (1997) and Doron (1999) that the infinitive in the Hebrew construction is base-generated in the initial position.

[5] I return below to BI-fronting.

internal to the grammar of Modern Hebrew suggest that VP-topicalization is really vP-topicalization. The verbal system in Hebrew (like all Semitic languages) is based on consonantal roots, which map onto seven paradigms, called *binyanim*, each with its own particular morphological template. Although the mapping is not entirely systematic, each *binyan* is associated, in the usual case, with a prototypical set of grammatical/semantic properties. These properties include a voice distinction (active vs. passive), transitivity, reflexivity and causativity. Inspired by Distributed Morphology, recent research has argued that the Hebrew verb is derived by merging the root with a light v, where the light v encodes the verbal paradigm, the *binyan* (Arad 1999, Doron 2003).

Now, it is a significant fact that Hebrew infinitival verbs are derived by adding the prefix *li-/le-/la-* to an absolute form already in the relevant *binyan*, and not directly to the root.[6] In other words, the infinitival verb is already fixed in a specific *binyan*, as can be seen below.

(14)   Infinitival verbs from the root [s,r,k]

        a.   *li-srok* – 'to scan'
        b.   *le-hisarek* – 'to be scanned'
        c.   *le-sarek* – 'to comb'
        d.   *le-histarek* – 'to comb oneself'

Given the discussion above, this means that the Hebrew infinitival verb is (minimally) a complex [√V+v], where √V is the root and v contributes the *binyan* template. It follows that PI-fronting targets the vP category. Since no tense/agreement features are present on the head [√V+v], it is assigned a default spellout of an infinitive.

On this view, the morphological discrepancy between the two verbal copies does not undermine the movement analysis (based on Copy and Delete); what is copied is, strictly speaking, a feature matrix that is only paired with phonological expression at the point of Spellout, following all syntactic operations (up to the phase level). Thus, we find here an argument for "Late Insertion" in the sense of Distributed Morphology.

In fact, this division of labor between syntax and morphology finds striking support in an example where the two verbal copies differ not only in inflection but in their actual root. The roots [y,g,d] and [ʔ,m,r] both mean 'tell' (in different *binyanim*), yet the former's morphological paradigm is defective in modern Hebrew, lacking all past and present forms; only the future and infinitive forms can be derived from [y,g,d]. There is reason to believe that in the missing tenses, inflected forms of [ʔ,m,r] are inserted as suppletive forms for [y,g,d]. In this light, consider the following contrast (to facilitate reading, I label defective and regular verbs as 'D' and 'R', respectively).

(15)   Rina omnam   nista le'hašpia   alay,   aval ...
        Rina although tried to-influence on-me, but...
        'Although Rina tried to influence me...

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[6] Two passive *binyanim* (*pu'al* and *huf'al*) do not have synthetic infinitives.

a.   ... le'hagid$_D$ li   ma   la'asot, hi lo amra$_R$.
           to-tell   me what to-do   she not told
           '... tell me what to do, she didn't'

b.   *... lomar$_R$ li   ma   la'asot, hi lo   tagid$_D$.
           to-tell   me what to-do   she not will-tell
           '... tell me what to do, she won't'

In both examples the defective root [y,g,d] is inserted under $\sqrt{V}$. After merging with v and T, the lower copy is spelled out using the suppletive form in (15a), due to the past tense. Nonetheless, it is the *original* root which is copied with the entire vP, as is evident from the fact that it is this root which projects the fronted, infinitival copy. Since [y,g,d] does have an infinitival form, [$ʔ,m,r$] cannot substitute for the higher copy in (15b), explaining the asymmetry.[7]

    The minimal pair in (15) confirms three important points. First, the fronted vP is indeed (copied and) moved to its surface position, and not generated there (otherwise, (15a) and (15b) would have been *both* good, or *both* bad, but not contrasting in a way that suggests asymmetrical copying). Second, it is vP and not any higher inflectional category that is copied and fronted (otherwise, the defective root would not have surfaced in the fronted copy in (15a)). Third, syntax maneuvers abstract feature bundles, not actual phonological matrices (otherwise, copy mismatches such as those in (15) would have been impossible).

    We may ask whether the choice of the copied head – root or category – differs across languages. In particular, are there languages in which it is the root, rather than the category V, which is copied in predicate fronting? Evidence for this choice would be i) loss of the morphological template on the fronted verb, or ii) ban on argument fronting with the verb (no counterpart to PI-fronting). Both features are displayed by predicate clefts in Biblical Hebrew, while the latter characterizes the construction in Vata and Haiti (Harbour 1999, 2002, Koopman 1984). It is reasonable to localize the parameter in the possible host of the [+Top/Foc] feature: light v in Modern Hebrew (as well as Brazilian Portuguese, see Bastos 2002), $\sqrt{V}$ in Biblical Hebrew, Haitian and Vata.

4.2.   Head or Phrasal Movement?

In the previous section we have established that PI-fronting, as in (16a), involves vP-Copying. We now turn to BI-fronting, as in (16b), and ask – what category is fronted?

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[7] Example (i), predicted to be ungrammatical, is judged marginal by some speakers:

i. ?% le'hagid$_D$ li   ma   la'asot, hi lo   tomar$_R$.
        to-tell   me what to-do   she not will-tell
        'Tell me what to do, she won't'

Speakers who accept such examples might substitute suppletive [$ʔ,m,r$] forms for future forms of [y,g,d] as well.

(16)   a.   [$_{vP}$ likro   et   ha-sefer], hu kara.
                      to-read ACC. the-book   he read
       b.   [$_{\alpha}$ likro], hu kara et   ha-sefer.
                      to-read he read ACC. the-book
              'Read the book, he did'

Logically, there are two possibilities. If α=V in (16b), then V-fronting is a non-standard case of long head movement. If α=vP, then it must contain a trace of the stranded object ("remnant movement"). Both positions were explored in the literature on VP-topicalization and predicate clefts in other languages. Long head movement of V has been proposed, among others, by Koopman (1984), Larson & Lefebvre (1991), Holmberg (1999), Harbour (2002) and Fanselow (2002). Remnant VP-movement has been proposed, among others, by den Besten & Webelhuth (1990), Koopman (1997), Müller (1998), Takano (2000), Abels (2001) and Hinterhölzl (2002).

For the Hebrew case, I will adopt the long V-movement analysis. Two sets of considerations point to this analysis. First, mounting positive evidence against the remnant VP-movement approach, even in scrambling languages like German (see Fanselow 2002); and second, the recent dissipation of the traditional argument against long V-movement.

The remnant movement analysis posits some scrambling operation of the stranded argument, prior to VP-fronting. However, Hebrew has no scrambling rule. Perhaps one could argue that the movement vacating VP need not be scrambling, for example, it could be movement for licensing purposes (Hinterhölzl 2002). The problem is that such movement is never attested *without* VP-fronting (Hebrew lacking overt Object Shift), and furthermore, there seems to be no restriction whatsoever on the type of elements that can be stranded in VP-fronting (PPs, secondary predicates, etc.). Re-labelling "scrambling" as "licensing movement" does not advance our understanding of the construction.

Consider then the alternative analysis, in which long V-movement is allowed. The traditional objection to this idea rests on the dichotomy between the strict locality of head movement and the unbounded nature of (A-bar) XP-movement. However, all the terms in this dichotomy – head, XP, A-bar – have lost much of their independent "essence" in recent research. The distinction between X^0 and XP, under bare phrase structure, is partly reduced to contextual relations: a non-projecting head is simultaneously an X^0 and an XP. The distinction between A- and A-bar positions is decomposed into smaller distinctions between case/agreement and operator features. Most importantly, within the minimalist framework, there is no theoretical link between the bar-level of an item (not even a detectable property, according to Chomsky 1995) and the scope of its potential movement.

Conversely, the alleged head nature of V-movement may be an artifact of constraints on affixation (e.g., T^0 may not attach to units bigger than a word). This approach leaves open the possibility that when nothing rules it out, long V-movement will be possible. My claim is that this is precisely what we observe in (16b) and, plausibly, in many other languages exhibiting parallel constructions.

To review, we have analysed PI-fronting as vP-fronting and BI-fronting as V-fronting (no remnant involved). We have answered two of the three questions posed at the beginning of section 4: Why is the fronted verb spelled out as an infinitive, and why is it allowed to undergo A-bar movement. Let us turn to the remaining question - Why is it that two copies of the verb are phonologically realized in VP-fronting?

5.   P-Recoverability and Economy of Pronunciation

Recall that chain resolution is constrained by the MCR.

(17)   *Modular Chain Resolution (MCR)*
        The decision which chain copy to pronounce/interpret is locally determined
        at PF/LF, respectively.

Theories meeting this condition on the PF side generally converge on two conclusions.

(18)   a.   PF copies that are demanded by PF requirements cannot not deleted.
        b.   PF copies that are excluded by PF requirements must be deleted.

Recent proposals appeal to (18b) in order to sanction PF-deletion of high copies in special circumstances (Franks 1998, 1999, Bobaljik 2002). But what forces pronunciation of the lower copy in these cases? Presumably, low pronunciation results from some notion of semantic recoverability: deleting both the higher copy (for PF reasons) and the lower one (for no particular reason) would make the semantic content of the item unrecoverable.

However, it was noted in section 1 that this line of reasoning runs afoul of the ban on PF-LF interactions (viz à viz chain resolution) implied by the MCR: PF has no way of "knowing" what copy, if any, is interpreted at LF, hence cannot use such information in deciding which copy to pronounce. Suppose instead that we restrict attention to recoverability of phonological features, call it *P-recoverability*. One can place a lower bound on pronunciation, which must be accepted on trivial grounds.

(19)   *P-Recoverability*
        In a chain $<X_1, ... X_i ... X_n>$, where some X_i is associated with phonetic content,
        X_i must be pronounced.

(19) implies that null chains can be formed only from null elements (*pro*, PRO, Op); PF does not tolerate unrecoverable phonological deletion, irrespective of its semantic repercussions. We understand "associated with phonetic content" as either having intrinsic phonetic content or occurring in a position specified with one (e.g., suporting an affix). P-recoverability places a lower bound on pronunciation in a chain: At least those copies must be pronounced which are associated with phonetic content.

An important aspect of (19), distinguishing it from the traditional formulations of recoverability, is that it does not assume any kind of contact between PF and LF. Thus, it is not because of the semantic content of X that at least one of its copies must be pronounced; indeed, (19) holds even if X is semantically vacuous, as long as X is associated with some phonetic content. A case in point is expletive chains (if they exist), where the top link must be pronounced, despite of being semantically empty.
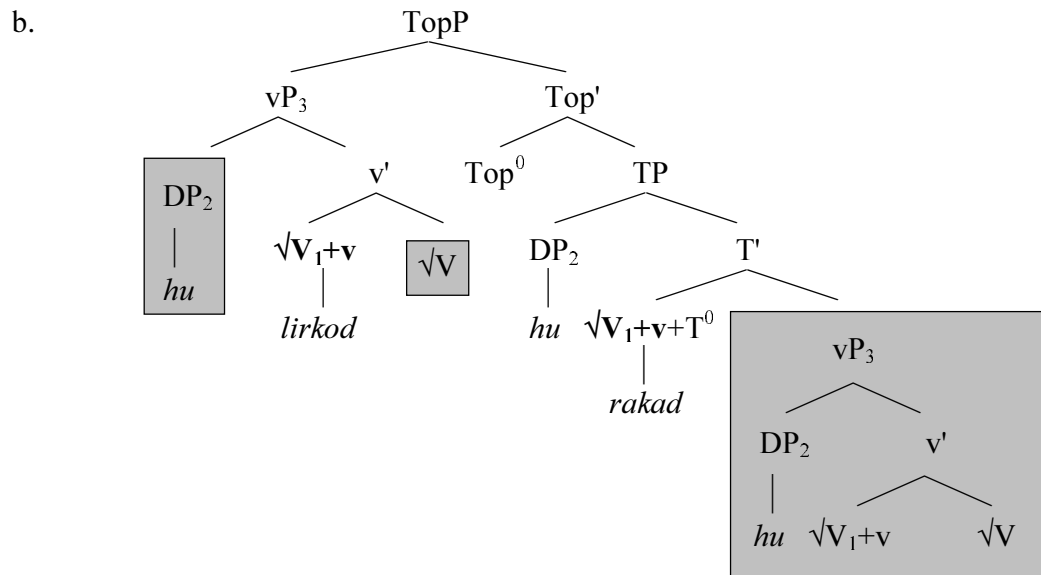
While (19) places a lower bound on chain pronunciation, it places no upper bound. Obviously, such a bound is needed, or else chain copies will never fail to be pronounced. I suggest that economy is the source of this bound.

(20) *Economy of Pronunciation*
      Delete all chain copies at PF up to P-recoverability.

The qualification "up to P-recoverability" in (20) serves as an permanent "ranking mark", indicating that P-recoverability *always* overrides economy. The universality of this ranking suggests that it is not part of some optimality-theoretic algorithm for chain resolution (where the relevant constraints are expected to be re-ranked in different constructions or languages). V(P)-fronting in Hebrew is a case where the overriding effect of P-recoverability is strikingly visible. Consider a typical example. The structure of (21a), in fact, contains three copies of V, only two of which are pronounced (21b).

(21) a.   lirkod,   hu rakad.
              to-dance, he danced
              'Dance, he did'

      b.

$$\text{TopP} \rightarrow [\text{vP}_3 \; [\text{DP}_2 \; hu] \; [\text{v}' \; [\sqrt{V}_1\text{+v} \; lirkod] \; [\sqrt{V}]]] \; [\text{Top}' \; \text{Top}^0 \; [\text{TP} \; [\text{DP}_2 \; hu] \; [\text{T}' \; [\sqrt{V}_1\text{+v+T}^0 \; rakad] \; [\text{vP}_3 \; [\text{DP}_2 \; hu] \; [\text{v}' \; \sqrt{V}_1\text{+v} \; \sqrt{V}]]]]]$$

PF-deletion applies to the shaded constituents. Let us refer to $[\sqrt{V}\text{+v}]$ simply as V. V raises to T, leaving a copy inside vP, and the subject raises to [Spec,TP]. The remnant vP then raises to the Topic position. Of the three V-copies, two are pronounced (boldfaced in (21b)): The V-copy adjoined to T, and the V-copy heading the fronted vP. The lower vP-copy is deleted at PF, together with its V-copy head.

      Observe now that the pronunciation of the two copies in (21b) is required by P-recoverability. The T^0-adjoined copy is associated with the phonological requirement of T^0 – namely, the need to spell out tense and agreement features (Hebrew lacks *do*-support). The fronted V-copy is associated with a phonological requirement imposed by Top^0, namely, the characteristic intonation of fronted VPs. This requirement, stated in (9), is crucially imposed on V, the head of the fronted VP. Failure to pronounce any of these two

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V-copies would violate (19). By contrast, the lowest V-copy is not associated with any phonological requirement, hence the economy condition (20) demands its deletion.[8]

This analysis solves a major puzzle – the double pronunciation of V in V(P)-fronting. Far from being an exception to general conditions on syntactic chains, the phenomenon of V-copying provides striking confirmation to these conditions, which cannot be gleaned from more familiar cases of movement.

Further evidence that it is a purely phonological requirement that forces pronunciation of the lower V-copy comes from minimal pairs like the following.

(22)   a.   le'ho'il   la-proyekt   šelanu hu lo *(ho'il)   af-pa'am.
             to-be-useful to-the-project our   he not *(be-useful.V) never

       b.   lihyot mo'il la-proyekt   šelanu hu lo haya (*mo'il)   af-pa'am.
             to-be useful to-the-project our   he not was (*useful.A) never
             'Useful to our project, he never was'

(22a,b) are semantically indistinguishable; they differ only in that the predicate is a synthetic verb in (22a) but an [Aux+Adj] complex in (22b). Crucially, the lower V-copy must be pronounced in the former, but deleted in the latter. The contrast follows from the fact that it is the lexical V itself that raises to T in (22a), spelling out tense/agreement features. By contrast, in (22b) it is Aux, not Adj., that raises to T to spell out those features; the lower A-copy must be deleted on economy grounds. It is hard to see how a semantic/pragmatic approach to chain pronunciation would deal with this contrast.[9]

More generally, P-recoverability improves over proposals that separate the cause of obligatory *deletion* (PF-constraints) from the cause of obligatory *pronunciation* (LF-recoverability). Under the present analysis, both follow from PF-constraints. The only non-PF factor implicated in deletion is economy, an overarching principle that does not impinge on the modularity of the system. Ideally, no principle beyond (19) and (20), which are warranted by very general considerations, should affect pronunciation of chain copies.

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[8] See Davis & Prince (1986), Dekydspotter (1992) and Abels (2001) for analyses that motivate pronunciation of the lower V-copy in VP-fronting along the same lines (namely, spelling out the p-features of T). Abels (2001) further argues that pronunciation of the higher V-copy is forced by recoverability of the focus interpretation (See Koopman 1997 for the analogous claim for Vata predicate cleft). The latter proposal is incompatible with the idea that PF-decisions are impenetrable to LF considerations (the MCR; see section 1).

[9] Abels (2001) cites a parallel contrast in Russian:

i.   Čitat' (-to) on čitatet, no ...
       to-read (PRT) he reads, but ...
       'He does read, but ...'

ii.   Čitat' (-to) on budet (*čitat'),   no ...
       to-read (PRT) he will   (*to-read), but ...
       'He will read, but ...'

The synthetic present tense verb in (i) is spelled out to support the features of T. By contrast, in the analytic future tense (ii) it is the auxiliary verb that serves this function, hence the lower (infinitival) V-copy must be deleted.

6. Conclusion

The view of chain resolution developed in this article has clear consequences for current syntactic theory. Perhaps the most robust empirical finding is the existence of copying operations in syntax. Throughout the discussion, we accumulated evidence that chains are formed by an operation *copying*, rather than *removing*, phonological and morphological information. The fate of that information – expression or deletion – is decided at PF.

Schematically, we analyzed two varieties of VP-fronting in Hebrew.

(23) a. *PI-fronting*
$[_{TopP} [_{VP} \text{SUB} [_{V'} V_i \text{ARG}]]_j \text{Top}^0 [_{TP} \text{SUB} V_i+T [_{VP} \text{SUB V ARG}]_j]]]$

b. *BI-fronting*
$[_{TopP} V_i \text{Top}^0 [_{TP} \text{SUB} V_i+T [_{VP} \text{SUB} V_i \text{ARG}]]]$

After establishing the movement relation between the two VP copies, we posed three questions: (i) Why is V pronounced twice? (ii) Why is the higher V-copy spelled out as an infinitive? (iii) What is the size of the fronted category in BI-fronting?

The answer to (i) rested on the notion of P-recoverability (19). It was argued that both the low position of V (adjoined to T) and the high position (Spec,Top) are associated with specific phonological requirements; failing to satisfy these requirements would result in a PF crash. In such special circumstances, the economy condition (20), normally deleting all copies but one, permits double pronunciation. Various independent arguments, both internal to Hebrew and crosslinguistic, support the claim that it is PF considerations *alone* that determine copy pronunciation. This result accords well with the MCR.

(24) *Modular Chain Resolution (MCR)*
The decision which chain copy to pronounce/interpret is locally determined at PF/LF, respectively.

The answer to (ii) rested on the notion of Late Insertion of p-features. I argued that the V node moved in the syntax is not specified for actual p-features, but rather those are inserted at the end of the syntactic phase. Lacking any tense/agreement features, the fronted V is spelled out as the default infinitival form (as seen in Hebrew, Yiddish, Russian and Brazilian Portuguese). In answering (iii) I rejected the remnant-VP analysis for (23b) and argued instead for a bare V-fronting analysis, no longer inconsistent with current conceptions of phrase structure.

One desirable consequence of the analysis is that it brings closer our notions of PF deletion and pronunciation. There is a tendency to attribute obligatory deletion to PF factors but obligatory pronunciation to recoverability constraints. The picture advocated here is more uniform, insofar as PF is endowed with the power to force either deletion or pronunciation in a given chain position. Residual instances of recoverability, I suggested, may be better viewed as constraints on possible interpretations rather than on possible deletions.

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References

Abels, Klaus. 2001. The Predicate Cleft Construction in Russian. In: Franks, Steven, Tracy H. King and Michael Yadroff (eds.), *Proceedings of FASL 9*, Ann Arbor: Michigan Slavic Publications, 1-18.

Alexiadou, Artemis, Elena Anagnostopoulou, Sjef Barbiers and Hans-Martin Gaertner. 2002. *Dimensions of Movement: From Features to Remnants*. Amsterdam: Johns Benjamins.

Arad, Maya. 1999. On 'Little v'. In: Arregi, Karlos, Ben Bruening, Cornelia Krause and Vivian Lin (eds.), *Papers in Morphology and Syntax, Cycle One*, MITWPL 33, 1-26.

Bastos, Ana Cláudia P. 2002. Three Types of V-topicalization in Brazilian Portuguese. Ms., Universidade Federal do Pará.

Bobaljik, Jonathan D. 2002. A-Chains at the PF-Interface: Copies and 'Covert' Movement. *NLLT* 20, 197-267.

Bošković, Željko. 2001. *On the Nature of the Syntax-Phonology Interface: Cliticization and Related Phenomena*. North-Holland Linguistics Series: Linguistic Variations, Elsevier Science, Oxford.

Chomsky, Noam. 1995. *The Minimalist Program*. MIT Press, Cambridge Mass.

Davis, Lori J. and Ellen F. Prince. 1986. Yiddish Verb-topicalization and the Notion 'Lexical Integrity'. In: Farley, Anne M., Peter T. Farley and Karl-Eric McCullough (eds.), *Proceedings of CLS* 22, University of Chicago, 90-97.

Dekydspotter, Laurent P. 1992. The Syntax of Predicate Clefts. In Broderick, K. (ed.), *Proceedings of NELS* 22, GLSA, Amherst, MA, 119-133.

den Besten, Hans and Gerth Webelhuth. 1990. Stranding. In: Grewendorf, Günther and Wolfgang Sternefeld (eds.), *Scrambling and Barriers*, Amsterdam: Benjamins, 77-92.

Doron, Edit. 1999. V-movement and VP-ellipsis. In: Benmamoun, Elabbas and Shalom Lappin (eds.), *Fragments: Studies in Ellipsis and Gapping*, Oxford: Oxford University Press, 124-140.

Doron, Edit. 2003. Agency and Voice: The Semantics of the Semitic Templates. *Natural Language Semantics* 11, 1-67.

Fanselow, Gisbert. 2002. Against Remnant VP-Movement. In: Alexiadou et. al. (eds.), 91-125.

Fanselow, Gisbert, and Damir Ćavar. 2001. Remarks on the Economy of Pronunciation. In: *Competition in Syntax*, ed. by Müller, Gereon and Wolfgang Sternfeld, Mouton de Gruyter, Berlin and New York, 107-150.

Franks, Steven. 1998. Clitics in Slavic. Position paper in the conference on "Comparative Slavic Morphosyntax", Indiana University.

Franks, Steven. 1999. Optimality Theory and Clitics at PF. In: Dziwirek, Katarzyna, Herbert Coats and Cynthia M. Vakareliyska (eds.), *Proceedings of FASL 7*, Ann Arbor: Michigan Slavic Publications, 101-116.

Hale, Ken and Samuel Jay Keyser, 1993. On Argument Structure and The Lexical Expression of Syntactic Relations. In: Hale, Ken and Samuel Jay Keyser (eds.), *The View From Building 20*, MIT Press, Cambridge, MA, 53-109.

Harbour, Daniel. 1999. The Two Types of Predicate Clefts: Classical Hebrew and Beyond. In: Lin, Vivian, Cornelia Krause, Benjamin Bruening and Karlos Arregi (eds.), *Papers in Morphology and Syntax, Cycle Two*, MITWPL 34, 159-176.

Harbour, Daniel. 2002. Klivaj Predika or Predicate Clefts in Haitian. To appear in *Journal of Pidgin and Creole Languages*.

Hinterhölzl, Roland. 2002. Remnant Movement and Partial Deletion. In: Alexiadou et. al. (eds.), 127-149.

Holmberg, Andres. 1999. Remarks on Holmberg's Generalization. *Studia Linguistica* 53, 1-39.

Källgren, Gunnel and Ellen F. Prince. 1989. Swedish VP-topicalization and Yiddish Verb-topicalization. *Nordic Journal of Linguistics* 12, 47-58.

Koopman, Hilda. 1984. *The Syntax of Verbs: From Verb Movement Rules in the Kru Languages to Universal Grammar*. Dordrecht: Foris.

Koopman, Hilda. 1997. Unifying Predicate Cleft Constructions. In: Moore, K. (ed.), *Proceedings of BLS* 23, *Special Session on Syntax and Semantics in Africa*, University of Berkeley.

Kratzer, Angelika, 1996. Severing the External Argument From Its Verb. In Rooryck, Johan and Laurie Zaring (eds.), *Phrase Structure and the Lexicon*, Dordrecht: Kluwer, 109-137.

Landau, Idan. 2004. Constraints on Partial VP-fronting. Ms., Ben Gurion University.

Larson, Richard and Claire Lefebvre. 1991. Predicate Cleft in Haitian Creole. In Sherer, Tim, Joseph Bayer and Jaklin Kornflit (eds.), *Proceedings of NELS* 21, GLSA, Umass, Amherst MA, 247-261.

Marantz, Alec. 1997. No Escape From Syntax: Don't Try Morphological Analysis in the Privacy of Your Lexicon. In: *UPENN Working Papers in Linguistics* 4.2, University of Pennsylvania.

Müller, Gereon. 1998. *Incomplete Category Fronting: A Derivational Approach to Remnant Movement in German*. Dordrecht: Kluwer Academic Publishers.

Pesetsky, David. 1998. Some Optimality Principles of Sentence Pronunciation. In: *Is the Best Good Enough*?, ed. by Pilar Barbosa, Danny Fox, Paul Haegstrom, Martha McGinnis and David Pesetsky, MIT Press and MITWPL, Cambridge MA, 337-383.

Takano, Yuji. 2000. Illicit Remnant Movement: An Argument for Feature-Driven Movement. *Linguistic Inquiry* 31, 141-156.

Ziv, Yael. 1997. Infinitives Initially: Theme/Topic/Focus. In: Connolly, John H., Roel M. Vismans, Christopher S. Butler and Richard A. Gatward (eds.), *Discourse and Pragmatics in Functional Grammar*, Berlin: Mouton de Gruyter, 163-175.

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