Abstract

The copy theory of movement receives the strongest form of support from instances of movement leaving phonetically visible copies. Such is the case in Hebrew V(P)-fronting, where the fronted verb surfaces as an infinitive, and its “trace” is pronounced as an inflected verbal copy. This paper argues that V-doubling is explained by the same algorithm that determines pronunciation of single copies in canonical chains. The phonetic resolution of chains is PF-internal, strictly local, and need not appeal to cross-interface recoverability constraints. Crosslinguistic variation in predicate clefts largely reflects different morphophonological strategies of realizing the fronted predicate head.

Keywords: Recoverability of deletion, copy theory of movement, VP-fronting, predicate cleft, late insertion, Hebrew syntax, remnant movement.
1. Introduction

How much of syntax can be derived from the properties of the phonetic and semantic interfaces? And to what extent can these properties be studied independently of their effect on syntax? These two intertwined questions have guided much research in the past decade. Gradually, it transpired that some syntactic phenomena are more easily amenable to minimalist analysis than others. This article is an attempt to deepen our understanding of one domain where the shift to "interface-driven syntax" has already made some non-trivial progress: The resolution of chains at the interfaces.

The empirical phenomenon studied in this article 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 (in the latter, as an infinitive). Thus, the construction invites an investigation of the factors requiring, allowing or excluding the phonetic expression of chain copies.

(1) lirkod, Gil lo yirkod ba-xayim.
   to-dance Gil not will-dance in-the-life
   'As for dancing, Gil will never dance'

In the background, I will assume 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. On this view, the traditional distinction between "overt" and "covert" movement, with the latter ordered after the former, is replaced by the distinction between "low deletion" and "high deletion", respectively, with no sequential ordering imposed among these choices.¹

A guiding minimalist intuition is that when possible, maximal explanatory burden should be shifted to the interfaces. Put differently, syntax should be purged of any internal devices that merely replicate the effects of other devices independently needed at PF or LF (Brody 1995, 1997).

Consider in this light the question of chain resolution, specifically at PF: which copy gets to be pronounced, and which to be deleted. It is conceivable that "narrow syntax" has a say on these matters; that syntactic operations affect, or even determine, how chains are

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¹ The "Copy and Delete" theory has provided much insight into various syntactic phenomena, including wh-movement (Groat & O'neil 1997, Fanselow & Čivar 2001), relative clause formation (Pesetsky 1998), Object Shift in Scandinavian (Bobaljik 2002), cliticization in Slavic (Franks 1998, 1999, Bošković 2001) discontinuous NPs in German and Croatian (Fanselow & Čavar 2002), and Aux-doubling in child English (Hiramatsu 2003).
pronounced. Yet clearly this state of affairs would be suboptimal from a minimalist point of view, and should be avoided, if possible. The reason is that we know that deletion of p-features – DeleteP – must be available independently of chain formation. DeleteP can be seen in VP-ellipsis, where the elided VP preserves all of its s-features, but none of its p-features (Chomsky & Lasnik 1993, Fox 2000).

(2)  DeleteP: VP-ellipsis

A: Who painted this picture?
B: I did paint this picture.

As far we know, VP-ellipsis does not involve chain formation. This means that the operation DeleteP must be available at the interfaces independently of the syntactic mechanism creating chains. The null hypothesis should be that the same interface operation is recruited to delete unnecessary p-features in chains; it seems reasonable to demand strong empirical arguments of any claim to the contrary. Let us state this desideratum as follows.

(3)  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. On the LF side, it is developed, in different forms, by Diesing 1997 and Fox 2000. Works that assume selective operations, like copying or movement of phonological (or semantic) features alone, are incompatible with PSCR (Groat & O'neil 1997, Aoun & Benmamoun 1998, Sauerland & Elbourne 2002), since they burden syntax with a task independently accomplished by the interfaces.2 The present article furnishes one further (novel) argument for the PSCR, on the PF side.

The PSCR leaves open the question of how the PF/LF interfaces decide which copy to pronounce/interpret. 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.

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2 There is some terminological confusion between PF/LF as pure interface levels, as opposed to (post Spell-Out) syntactic components. The latter view preserves the pre-minimalist architecture of grammar, where movement can apply either at PF or at LF. However, if PF/LF are just interfaces, no movement can apply in them (see Bošković 2001 for extensive arguments against phonological/prosodic movement). This is still compatible with the idea that PF feeds a morphological component, where further local (re-)arrangements of items occurs (Embick & Noyer 2001).
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. The MCR is somewhat related to Chomsky's (2001, ex. 13) proposal that "surface semantic effects are restricted to narrow syntax". In the context of that discussion, this proposal is intended to prohibit PF operations from affecting LF interpretations. If we take Deletep to be a PF operation, this implies that the choice of which copy to pronounce must not interact with the choice of which copy to interpret.

There are obvious challenges to MCR within current research. Most important of them is the constraint on recoverability of deletion (RoD), which dates back to the earliest work in the field. Consider one classical formulation and two recent ones, all pretty standard.

(5)  

a. **Recoverability of Deletion** (Chomsky 1965: 182)  
A term X of the proper analysis can be used to erase a term Y of the proper analysis just in case the inherent part of the formative X is not distinct from the inherent part of the formative Y.³

b. **Recoverability** (Pesetsky 1998)  
A syntactic unit with semantic content must be pronounced unless it has a sufficiently local antecedent.

c. **Recoverability** (Fanselow & Čavar 2001)  
The content of unpronounced elements must be recoverable from a local antecedent.

The intuition behind these formulations is clear enough; without some constraint on deletion, language will not be useable at all, since the gap between actual utterances and their intended meanings would be too vast to bridge. However, it is unclear whether statements such as those in (5) – which are quite standard – can be reconciled with the MCR. Notice that these statements make PF deletion contingent on LF recoverability. In other words, in order to

³ Chomsky distinguished between "inherent" features of a lexical entry/position (e.g., semantic features), and "noninherent" features, added by transformations (e.g., -features); lexical items with identical inherent features and unspecified "noninherent" ones are nondistinct. (5a) is readily translatable to (5b)/(5c), taking X to be the "local antecedent" and "inherent part" to be "(semantic) content".
comply with such constraints, the computational system must make LF information accessible to PF choices. This is precisely what it barred by MCR.

The question then is – can the undeniably correct intuition behind RoD constraints be given an MCR-compatible form? Perhaps is can, although I will not attempt a full answer in this paper. Notice that the effect of RoD constraints is independent of the assumption that they apply at PF. Suppose we discard that assumption. Then we may construe the RoD constraints in (5) as interpretive constraints, reflecting the limits of our “filling-in” semantic-pragmatic system. It is perfectly legitimate, as far as PF is concerned, to delete “irrecoverably”. The problem would arise at the semantic interface, where the remnant material will be uninterpretable. This way of excising RoD out of narrow syntax is both intuitively appealing and compatible with MCR.

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

(6) a. Scoping (Diesing 1997)
The scope of operators must be syntactically fixed.4

b. ParseScope (Fanselow & Čavar 2001)
If $\alpha$ has scope over $\beta$ then the phonetic matrix of $\alpha$ c-commands the phonetic matrix of $\beta$.

c. 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?5

4 This principle carries more weight than it seems to. Diesing (1997) uses it to rule out covert movement of objects in Germanic (except English), that is, to force a PF-LF match.

5 Another member of the family of principles in (6) is Brody's (1995) Transparency: "The contentive category in the chain must be in the highest position licensed by morphology" (p. 104). However, Brody's principle is different in two important respects. First, it leaves no room for purely phonological factors to affect the choice of copy at PF ("morphology" above being narrowly understood as the strong/weak feature distinction). Second,
It is worth noting that other analyses exist that do respect the MCR. Pesetsky 1998, Franks 1998, 1999 and Bošković 2001, among others, frame pronunciation preferences in PF-internal terms only. Roughly, the idea is — "Pronounce the highest copy whenever possible". Notice that "highest" is determined by c-command relations, available at PF by assumption. The problem with such principles is their stipulative nature; if it is not for scope transparency, what is it that makes higher copies better candidates for pronunciation? Franks (1999) suggests that the highest copy "preserves the most information and is thus the one most 'faithful' to Spell Out" (p. 112). But notice that all copies are created equal, so to speak, prior to chain resolution, and therefore no single copy contains more information than any other one. The idea that Spell Out exists as a representational level where copies are distinguished in terms of their "faithfulness" seems to duplicate the function deliberately assigned to the interfaces; it implies retraction from the PSCR.\(^6\)

In the analysis to follow, I will argue that one can hope to do better, by explicating (case by case) the actual PF requirements that favor high pronunciation, or even double pronunciation. The latter scenario, displayed by Hebrew VP-fronting, will prove to be especially illuminating for the understanding of the PF-resolution of chains.

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. In section 4.1 I show that the copied element is already a verb (light v + root) in Hebrew, although possibly a root in Biblical Hebrew. Section 4.2 brings into the picture V-doubling in other languages (Yiddish, Kwa/Kru languages, Haitian), pointing out their theoretical implications for a comprehensive typology of the construction.

Section 5 argues that when stranding its arguments, the fronted category is a bare V (rather than a remnant VP). Section 6.1 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 6.2 discusses potentially problematic examples of headless remnant VPs in other languages. Section 7 concludes the paper.

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within Brody's non-derivational model, the mapping to PF takes LF as input. Thus, LF in this system (or rather, LLF – lexico-logical form) contains phonological and formal features, over and above semantic features. Abandoning strict modularity as a design feature, the issue of how the two interfaces can communicate does not arise: PF choices can (and must) be informed by LF choices since the former are implicated in the latter.

\(^6\) The chain reduction algorithm of Nunes 1999 is consistent with the requirement that no LF considerations enter PF choices. However, the actual role of phonology in this algorithm is negligible. Normally, Nunes argues, the need to linearize non-trivial chains in accordance with Kayne's LCA forces deletion of all but one chain copy. Economy considerations (applying at PF, although sensitive to formal features only) determine that it is the highest copy that survives. Crucially, these are global considerations (comparing derivations with different PF histories), not permitted by the MCR.
2. General Description of VP-fronting in Hebrew

2.1. Syntax, Morphology and Phonology

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 T₀ and in the fronted VP, giving rise to V-copying. While the low verbal copy is fully inflected, the higher one is an infinitive.⁷

(7) lirkod, Gil lo yirkod ba-xayim.
    to-dance Gil not will-dance in-the-life
    'As for dancing, Gil will never dance'

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).⁸

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

b. liknot, hi kanta et ha-praxim.  
    to-buy, she bought ACC. the-flowers
    'As for buying, she bought the flowers'

(9) a. le'ha'amin be-nisim, hu ma'amin.  
    to-believe in-miracles, he believes
    'As for believing in miracles, he believes'

b. le'ha'amin, hu ma'amin be-nisim.  
    to-believe, he believes in-miracles
    'As for believing, he believes in miracles'

⁷ Many languages employ V-copying in VP-fronting, e.g., Haitian, Vata, Yoruba, Korean, Brazilian Portuguese, Yiddish and Russian. The last three, like Hebrew, realize the higher V-copy as an infinitive.

⁸ Here and below, I translate the Hebrew construction with the English "as for ..." construction. The reader should bear in mind, however, that this translation approximates the pragmatics of the original at the cost distorting its (simple topicalization) syntax.
BI-fronting is ruled out with the verb *haya* 'be', for pragmatic reasons discussed in the next section. Other than that, the alternation between the two fronting options is completely free. I will assume that the fronted category occupies some topic position.

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 5. 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).

(10) a. le'horid et ha-maym, Gil lo tamid morid.
    to-flush ACC. the-water Gil not always flushes
    'As for flushing the toilet, Gil doesn't always flush'

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

Of course, when a true infinitival clause is fronted, it may contain either of these elements.

(11) (lo) (tamid) le'horid et ha-maym, Gil hištadel.
    (not) (always) to-flush ACC. the-water Gil tried
    'To (not) (always) flush the toilet, Gil tried'

Thus, the initial infinitive in (10) 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.9

The phenomenon of V-copying is widespread (Koopman 1984, Davis & Prince 1986, Lefebvre 1992, Manfredi 1993, Abels 2001, Jo 2003). It has received much attention in the study of predicate clefts in African and Creole languages. The Hebrew case raises many interesting issues, some of which are highly relevant to current discussions on the nature of the PF interface. These issues are explored in depth in the rest of this paper.

As to the phonology of the construction, the relevant aspect is intonation. The intonational character of VP-fronting is obviously related to its pragmatic function, and since that function is not unique (see next section), we may expect to find more than one intonation associated with the construction. Here I will limit myself to the most basic observations.

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9 More precisely, only the verb and the material to its right. Right-adjointed adverbs may be included in the initial VP:

i. le'horid et ha-maym bin'hirut, Gil horid.
   to-flush ACC. the-water quickly Gil flushed
   'As for flushing the toilet quickly, Gil flushed'
The most salient intonational feature of VP-fronting is the high pitch accent on the stressed syllable of the (infinitival) fronted 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.

\[
\text{(12) } \quad \text{H}^* \quad \text{L}^- \quad \text{(H\%)} \\
\text{likRO } \text{et} \quad \text{ha-sefer, Gil kara.} \\
\text{to-read ACC. the-book Gil read} \\
\text{'}As for read the book, Gil read'}
\]

There is also some indication that the infinitival verb must coincide with the left boundary of its intonational phrase. Left-adjoined VP-adverbs (13a), even when monosyllabic and destressed (13b), may not front with the VP.

\[
\text{(13) a. } \quad \text{(*bi-zrizut) lištôf et ha-kelim hu (bi-zrizut) šataf.} \\
\text{(*promptly) to-wash ACC. the-dishes he (promptly) washed.} \\
\text{'}As for washing the dishes, he promptly washed'}
\]

\[
\text{b. } \quad \text{(*kvar) lištôf et ha-kelim hu (kvar) šataf.} \\
\text{(*already) to-wash ACC. the-dishes he (already) washed.} \\
\text{'}As for washing the dishes, he already washed'}
\]

One might argue that (13) is ruled out on a par with (10b), on the assumption that even VP-adverbs project their own projection. However, evidence from Russian – a language where VP-fronting bears striking similarity to Hebrew – suggests otherwise. Abels (2001) observes that VP-adverbs can, but S-adverbs cannot, join the fronted VP.

\[
\text{(14) a. } \quad \text{Bystro pečatat' (-to) on pečataet, no delaet mnogo ošibok.} \\
\text{fast to-type (PRT) he types but makes many errors} \\
\text{'}He types fast, but he makes a lot of mistakes'}
\]

\[
\text{b. } \quad \text{* Včera pečatat' (-to) on pečatal, no sdelal mnogo ošibok.} \\
\text{yesterday to-type (PRT) he typed but made many errors} \\
\text{'}He did type yesterday, but he made a lot of mistakes'}
\]
Plausibly, this contrast is explained by the fact that VP-fronting cannot target projections higher than VP (a fact confirmed in many languages), coupled with the assumption that the VP-adverb *bystro* 'fast' in (14a) is adjoined to VP, rather than introduced in a separate projection. This allows us to maintain uniformity in the categorial status of fronted predicates, while reducing the parametric contrast between (13) and (14a) to phonological factors. In particular, Hebrew requires strict prosodic alignment between the infinitival verb and the left boundary of the intonational phrase, Russian does not.

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

(15) 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.

The relevance of (15) for the analysis of the phonological copying of V will be discussed in section 6.1.

2.2. Pragmatics

This investigation is primarily syntactic in nature, hence I will not dwell much on the pragmatic nature of VP-fronting in Hebrew. The following comments are intended to convey the general "flavor" of the construction and to situate its discourse functions within the larger crosslinguistic literature on VP-fronting and predicate clefts.

Crosslinguistically, V-copying constructions seem to fall into two pragmatic 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 interpretation.

Most commonly, VP-fronting in Hebrew marks a Topic or contrastive Focus (see Ziv 1997); both cases invoke a VP-meaning already given in the discourse – either the meaning of the fronted VP itself, or a set of alternative meanings with which it is contrasted (Erteschik-Shir 1997). The new information could be either a certain constituent in the clause, or the affirmation/negation of that clause. Stress placement serves to mark that information. Often (but not always) the entire proposition is construed as a concessive admission, implying a contrastive proposition which could be either left implicit or expressed in a “but…” conjunction.10

10 The pragmatics of the construction is very similar in Yiddish (Källgren & Prince 1989), Russian (Abels 2001) and Korean (Jo 2003).
(16) a. le-Rina yeš xuš humor, aval licxok hi coxe ket rak al axerim.
   'Rina has a sense of humor, but as for laughing, she will only laugh at others'

   b. le-Rina yeš xuš humor, aval licxok al acma hi LO ticxak.
   'Rina has a sense of humor, but as for laughing at herself – she won't laugh'

   In both (16a,b), the fronted infinitive is interpreted contrastively. In (16a) axerim 'others' is in focus while in (16b) the entire negative proposition hi lo ticxak 'she won't laugh' is focused. Notice that the contrastive focus is 'to laugh' in (16a) but 'to laugh at herself' in (16b). 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.

   Since PI-fronting requires alternatives to VP-meanings – basically, one place predicates – and BI-fronting requires alternatives to V-meanings alone (keeping the arguments fixed), the latter is expected to be more resistant to contrastive focus. This is particularly evident with idiomatic VPs. BI-fronting dissociates the fronted verb from the idiom chunk, and the search for V-alternatives forces a literal meaning on the former; the result is nonsense.

(17) a. Gil omnam xadaš po, aval litfos taxat hu kvar tafas.
    'Although new here but to-grab ass he already grabbed'

   b. * Gil omnam xadaš po, aval litfos hu kvar tafas taxat.
    'Although new here but to-grab he already grabbed ass'

   BI-fronting is similarly 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.

(18) a. lihyot zamin, Gil lo tamid haya.
    'As for being available, Gil wasn't always'
b. * lihyot, Gil lo tamid haya zamin.
   to-be Gil not always was available
   'As for being, Gil wasn't always available'

Interestingly, Davis & Prince (1986) point out that in contrast to the auxiliary BE, the copula
BE can be clefted from a locational predicate. The same is true of Hebrew.

(19) lihyot, Gil haya be-nyu york (aval rak xaci yom).
   to-be Gil was in-New York (but only half day)
   ‘As for being, Gil was in New York, but only for half a day’

Notice that all verbs in Hebrew, not just auxiliaries, overtly raise to T. Therefore, (18b) cannot
be analyzed, and ruled out, as an instance of TP-fronting. Moreover, the contrast with (19),
where the auxiliary can be fronted, suggests that the restriction is not syntactic in nature (as
there is no reason to assign different syntactic positions to the auxiliaries in the two cases).
Rather, we are led to conclude that the copula in (19) is rich enough semantically to serve as a
topic, but the one in (18b) is not. I leave open the precise source of this contrast.

To summarize, the following properties of VP-fronting fall under its pragmatic analysis:

(20) a. The fronted category is interpreted as a Topic or contrastive Focus.
b. Auxiliary verbs do not participate in BI-fronting.
c. Idiom verbs do not participate in BI-fronting.

3. Evidence for Ā-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 Ā-movement. Importantly, the characteristics of Ā-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 Ā-dependencies:

(21) a. la'azor le-Rina, eyn li safek še-Gil hivtiay še-hu ya'azor.
   to-help to-Rina there-isn't to-me doubt that-Gil promised that-he will-help
   'As for helping Rina, I have no doubt that Gil promised he would help'
b. 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
'As for helping, I have no doubt that Gil promised he would help Rina'

(22) a. 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
'As for cleaning the yard, it seems to me that Rina said that Gil had already cleaned'

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

However, the dependency is island sensitive:

(23) Wh-island

a. ?? likro et ha-sefer, ša'alti matay Gil kvar kara.
to-read ACC. the-book asked.1sg when Gil already read
'As for reading the book, I asked when Gil had already read'

b. ?? likro, ša'alti matay Gil kvar kara et ha-sefer.
to-read asked.1sg when Gil already read ACC. the-book
'As for reading, I asked when Gil had already read the book '

(24) Complex NP island

a. * 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
'As for reading the book, Gil rejected the claim that he had already read'

b. * likro, Gil daxa et ha-te'ana še-hu kvar kara et ha-sefer.
to-read Gil rejected ACC. the-claim that-he already read ACC. the-book
'As for reading, Gil rejected the claim that he had already read the book '
(25) **Subject island**

a. * likro et ha-sefer, še-yevakšu me-Gil še-yikra ze ma'alin.
   to-read ACC. the-book that-will-ask.3pl from-Gil that-will-read.3sg it insulting
   'As for reading the book, that they would ask Gil to is insulting'

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

(26) **Adjunct island**

a. * likro et ha-sefer, nifgašnu axarey še-kulam kar'u.
   to-read ACC. the-book met.1pl after that-everybody read.3pl
   'As for reading the book, we have met after everybody read'

b. * likro, nifgašnu axarey še-kulam kar'u et ha-sefer.
   to-read met.1pl after that-everybody read.3pl ACC. the-book
   'As for reading, we have met after everybody read the book'

The data in (21)-(26) clearly indicate that the dependency between the initial (infinitival) VP and its copy downstairs is formed by Â-movement. In other words, we are looking at an instance of VP-fronting. As is well-known, predicate movement is subject to weak islands, like adjunct (but unlike argument) movement. This is also true of the Hebrew construction (see Koopman 1984 and Dekydspotter 1992 for the same observation in Vata and Yoruba).

(27) **Factive/non-bridge island**

a. le'hacbia la-avoda, Gil amar/*laxaš/*hitcta'er še-Rina kvar hicbia.
   to-vote to-the-Labor Gil said/*whispered/*regretted that-Rina already voted
   'As for voting to the Labor party, Gil said/*whispered/*regretted that Mary had already voted'

b. le'hacbia, Gil amar/*laxaš/*hitcta'er še-Rina kvar hicbia la-avoda.
   to-vote Gil said/whispered/regretted that-Rina already voted to-the-Labor
   'As for voting, Gil said/*whispered/*regretted that Mary had already voted to the Labor party'
To sum up, VP-fronting in Hebrew is formed by standard Ā-movement and respects all the islands constraints characteristic of predicate movement.

A legitimate worry to raise at this point is the following. Although we have direct evidence for Ā-movement, we do not have direct evidence that the initial VP *itself* moves. One can imagine that this VP is base generated in a Topic position; what is moving is a null operator, bound by this VP.

(28) \([\text{VP}_i [\text{Op}_i \ldots [\text{Subj. V}_t] ]]\)

I take it that this “relative-clause” type analysis, being more complex than simple VP-fronting, bears the burden of proof. The clearest evidence in its favor would be a possible lexical mismatch between the topic and the lower VPs. Indeed, such cases are attested in Yiddish and Brazilian Portuguese, where the lower predicate further specifies the higher one (Cable 2004). Notice that either the object or the entire VP may be different in the two loci.

(29) **Brazilian Portuguese**

a. Comer peixe, a Maria acha que eu como samão.
   to-eat fish Mary thinks that I eat salmon
   ‘As for eating fish, Mary thinks that I eat salmon’

**Yiddish**

b. Forn kayn amerike bin ikh gefloygn keyn nyu-york.
   to-travel to America am I flown to New York
   ‘As for traveling to America, I have flown to New York’

Cable (2004) shows that island sensitivity is observed even in these “genus-species” cases, supporting an analysis along the lines of (28).

Importantly, the Hebrew counterparts of (29) are completely ungrammatical.\(^{11}\)

(30) a. * le’exol dagim, Rina xoševet še’ani oxel salmon.
    to-eat fish Rina thinks that-I eat salmon
    ‘As for eating fish, Rina thinks that I eat salmon’

b. * letayel le-amerika, tasti le-nyu-york.
   to-travel to-America I-flew to-New York
   ‘As for traveling to America, I have flown to New York’

\(^{11}\) (30a) can be rescued if the stranded argument is expanded (e.g., *aval rak salmon* ‘but only salmon’) and set off by a comma, thereby exploiting the so-called stripping construction. (30b) is beyond repair.
I conclude that VP-topicalization in Hebrew involves actual fronting of the topic VP, rather than base-generation (contra the claims in Ziv 1997 and Doron 1999). More evidence favoring the former over the latter view will be presented in section 4.1.

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 (21b)/(22b)/(27b), 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 $\Phi$-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?

In section 2.1 it was shown that the fronted category in the construction under discussion is a VP. In particular, internal arguments can, but negation and adverbs cannot, be carried along with the verb. Recent studies, however, advance the hypothesis that VP is really only a constituent of the predicate phrase, more aptly named vP. 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. This hypothesis receives empirical support from various sources, and I will take it to be essentially correct (see, among others, 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] (see also McGinnis 2000, Pylkkänen 2002). Henceforth I will call $\sqrt{V}$ 'the root' and the complex $[\sqrt{V}+v]$ 'the category 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. A further question is whether the choice is universal or parametric. I will address these issues in turn.

Considerations internal to the grammar of Modern Hebrew suggest that VP-topicalization is really vP-topicalization; the fronted category is vP, not the smaller $\sqrt{V}$P

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12 I return below to BI-fronting.
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 concluded 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 about Hebrew infinitival verbs that they are derived by adding the prefix *li*-/*le*-/*la*- to an absolute form already in the relevant *binyan*, and not directly to the root.13 In other words, the infinitival verb is already fixed in a specific *binyan*, as can be seen below.

(31) **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 \[\sqrt{V}+v\], where \(\sqrt{V}\) 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 \[\sqrt{V}+v\], 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 \[n,g,d\] and \[?,m,r\] 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 \[n,g,d\]. There is reason to believe that in the missing tenses, inflected forms of \[?,m,r\] are inserted as suppletive forms for \[n,g,d\]. For example, when VP-ellipsis strands a remnant verb in Infl, that verb may be suppletive (to facilitate reading, I label defective and regular verbs as 'D' and 'R', respectively).

---

13 Two passive *binyanim* (*pu'al* and *huf'al*) do not have synthetic infinitives.
(32) Gil yagid$_D$ et ha-emet lamrot še-Yosi lo amar$_R$.
        Gil will-tell ACC. the-truth even-though that-Yosi not told
        'Gil will tell the truth even though Yosi didn't'

In this light, consider the following contrast.

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

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

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

In both examples the defective root \([n,g,d]\) is inserted under √V. After merging with v and T, the lower copy is spelled out using the suppletive form in (33a), 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 \([n,g,d]\) does have an infinitival form, \([?,m,r]\) cannot substitute for the higher copy in (33b), explaining the asymmetry.\(^{14}\)

The minimal pair in (33) confirms three important points. First, the fronted vP is indeed (copied and) moved to its surface position, and not generated there (otherwise, one would expect (33a) and (33b) to be 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 (33a)). Third, syntax manoeuvres abstract feature bundles, not actual phonological matrices (otherwise, copy mismatches such as those in (33) would have been impossible).

\(^{14}\) (33b) cannot be ruled out by reference to its future tense; VP-fronting is indifferent to tense (cf. (21), (22)). 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
      'As for telling me what to do, she won't tell'

Speakers who accept such examples might substitute suppletive \([?,m,r]\) forms for future forms of \([n,g,d]\) as well.
It is instructive to compare Modern Hebrew with Classical Hebrew, where topicalization was argued to be able to target √V, as well as [√V+V]. Harbour (1999) observes that in the Biblical predicate cleft, the clefted copy may surface either in the original binyan of the lower copy or in the pa'al paradigm, which is the default (least specified) binyan.\(^{15}\) The following is a minimal pair (the meanings are far more similar than is implied by the King James translations).

(34) **Predicate Cleft in Classical Hebrew** (Harbour 1999, ex. 15)

\[\text{a. } [\sqrt{\text{V}}] \ldots [\sqrt{\text{V+V}}] \]
\[
\text{w'attåh hu' nâqoh tinnåqâh} \quad \text{lo' ðinnåqâh}.
\]
\[
\text{and-thou he be-clean you-will-be-clean not you-will-be-clean}
\]
\[
\text{'And art thou he that shall altogether go unpunished?}
\]
\[
\text{Thou shall not go unpunished'}
\]
\[
\text{(Jeremiah, 49, 12)}
\]

\[\text{b. } [\sqrt{\text{V+V}}] \ldots [\sqrt{\text{V+V}}] \]
\[
\text{w'attem hinnåqeh ðinnåqâh} \quad \text{lo' ðinnåqu}.
\]
\[
\text{and-you be-clean you-will-be-clean not you-will-be-clean}
\]
\[
\text{'And should ye be utterly unpunished? Ye shall not be unpunished'}
\]
\[
\text{(Jeremiah, 25, 29)}
\]

Harbour notes that this is a general pattern: The default (pa'al) is available as the cleft form for any binyan, alongside the form with a matching binyan. He reasonably attributes this alternation to a spell-out choice: In his analysis, the Biblical construction is formed by head movement of V to the focus position. Depending on which copy in the verbal chain is moved to the focus position – the lower √V or the higher [√V+V] – the clefted verb will surface as a default or matching binyan form, respectively.

Crucially, Modern Hebrew does not allow any analogous alternation. The clefted infinitive must be in the binyan of the lower copy of the verb, and no other form is acceptable. Notice that this is so even when the variants of verb in the two binyanim are closely related, or nearly identical, in meaning:

(35) a. le'hitkatev / *lixtov / *le'haxtiv, Gil af-pa'am lo hitkatev im Rina.
\[
\text{to-correspond / *to-write/ *to-dictate Gil never no corresponded with Rina}
\]
\[
\text{'As for corresponding with Rina, Gil never corresponded'}
\]

---

\(^{15}\) The classical construction differs from the modern one also in the syntactic scope of the predicate's movement; see Harbour 1999 for more details.
We can describe the contrast between Biblical and Modern Hebrew as follows.

(36)  \textit{V-copying Options}

<table>
<thead>
<tr>
<th>Head Copied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical Hebrew</td>
</tr>
<tr>
<td>Modern Hebrew</td>
</tr>
</tbody>
</table>

One may ask how this variation is derived. Obviously, some parameter must determine the copying options in a given language. A natural place to look for this parameter is in the feature that motivates V(P)-fronting. Plausibly, this is the [+Top] feature, which marks a certain head as a topic.\footnote{Recall that we treat contrastive focus as a subkind of a topic; see section 2.2.} The variation represented in (36) thus boils down to a variation in the type of heads to which the feature [+Top] may attach in a given language. In Classical Hebrew [+Top] may attach to either $\sqrt{V}$ or light $v$; in Modern Hebrew, only to the latter. In principle, we expect a third typological option – languages in which V-fronting draws exclusively on $\sqrt{V}$-copying. It is possible that Haitian and Vata, in which arguments may never front with V, are such languages.

Percolation of [+Top] from $v$ to vP may be possible, obligatory or impossible, accounting for the pied-piping options attested in the language (e.g., BI vs. PI-fronting). However, the crosslinguistic picture of V-doubling involves more complexities; we address a few of them in the next section.

4.2. Crosslinguistic Aspects of V-doubling

In this section I touch on several issues that arise from comparison of the different manifestations of V-doubling constructions across languages. The discussion is exploratory in nature, aimed at sharpening questions and characterizing potential answers rather than providing a full-fledged analysis.

The Hebrew examples in (33) illustrated, very locally, the word-formation capacity of syntax. Striking examples to the same effect are reported for predicate clefts in other languages. I will restrict attention to two main cases – Yiddish and the Kwa/Kru languages.

Although the fronted verb in Yiddish, like in Modern Hebrew, is spelled out as an infinitive, there is clear evidence that this infinitive is a default spell-out of the verbal stem, rather than a genuine infinitive. Davis & Prince (1986), Källgren & Prince (1989) and Hoge...
(1998) observe that when a verb with an irregular infinitive is topicalized, the irregular form is blocked by a regularized form, unattested otherwise. This "pseudoinfinitive", as the authors call it, is formed by suffixing –n to the verb stem.

(37) *V-topicalization in Yiddish* (Hoge 1998, ex. 2)

a. Veysn / *visn veyst zi es.
   to-know knows she it
   'She *knows* it'

b. Gibn / *gebn gibt zi dem kind a kikhl.
   to-give gives she the child a biscuit
   'She *gives* the child a biscuit’

c. Viln / *veln vil zi a kikhl.
   to-want wants she a biscuit
   'She *wants* a biscuit'

Notice that the actual infinitives (visn/gebn/veln) can be fronted when they spell out a clause rather than a verb (cf. (37a)).

(38) Visn / *veysn ken ikh nit.
    to-know can I not
    'Know, I cannot'

Furthermore, Cable (2003) shows that the pseudoinfinitive surfaces only when the copied verb is finite (i.e., in the present tense). Past participles and infinitives, when clefted, give rise to the standard forms in the topic position.

(39) a. Visn/*veysn vilt er es visn.
    to-know wants he it to-know
    ‘As for knowing, he wants to know it’

b. Visn/gevust/*veysn hot er es gevust.
    to-know/known has he it known
    ‘As for knowing/having known, he has known it’
A natural way to understand this pattern is to assume that the target of copying in Yiddish is the verb stem, \([\sqrt{V} + v]\). In (37) the stem is unmarked, but being a bound form, it cannot be pronounced in isolation. \(-n\) affixation applies at PF to yield a legitimate word (Davis & Prince 1986, fn. 3). In (39) the verb stem is marked \([-\text{Finite}]\). Since a vocabulary item matching this specification already exists – namely, the infinitive – it is inserted in the topic position, and no PF repair is needed. Yiddish also allows copying of the full participle, as shown in (39b). This indicates that the \([+\text{Top}]\) feature may be assigned to Part\(^0\), as well as to \(\sqrt{V}\) or \(v\).\(^{17}\)

Does V-fronting always produce a nonfinite copy? Apparently the answer is no, although there are far fewer studies of finite V-fronting. In Swedish (as well as Norwegian), a clefted finite verb bears full inflection, doubling the inflection on a dummy verb left behind (Källgren & Prince 1989). In Korean, V-doubling may co-occur with Agr/T-doubling (Choi 2001, Jo 2003). Whether these constructions should be properly analysed as VP or TP fronting is a question I will not address.

A different strategy employed in predicate clefts is nominalization of the clefted verb, commonly found in the Kwa/Kru languages (Manfredi 1993), but also in Korean (Jo 2003) (NMZ=nominalizer, DECL=declarative).

(40) Yoruba

a. rí-rà ni Ajé ra iwé.
   NMZ-buy COMP Aje buy paper
   ‘It is buying that Aje is doing/did to a book/books’
   [i.e., he didn’t steal it/them]

Korean

   Chelswu-NOM the book.ACC  read-NMZ-TOP read-PAST-DECL
   ‘Chelswu did read the book (but…)’

The source of the nominal morphology, in both cases it seems, is a language-specific constraint: only N/NP can serve as a topic/focus. For the African languages, Manfredi (1993) argues that this reflects a selectional restriction of the copula/complementizer that licenses the

---

\(^{17}\)Hoge (1998) explicitly rejects this analysis and claims that the pseudoinfinite is selected from the lexicon and enters the numeration as such. This view offers insight neither into the puzzle of the occurrence of pseudoinfinities only in V-topicalization, nor to their absence in (39).

Cable (2003) accounts for the contrast between (37) and (39) in terms of phonological parallelism, restricted by cyclic spellout. The idea is that the clefted V and the base V are spelled out in the same phase in (37), hence subject to phonological parallelism, but in different phases in (39), hence free to be phonologically dissimilar. Although ingenious, the account predicts no phonological parallelism in long-distance clefts of a finite V. However, the pseudoinfinite must be used in these cases as well (Davis & Prince 1986, ex. (11a); Hoge 1998, ex. (13b)).
cleft construction. In Igbo, the nominalized reduplicated V can occur in-situ, in fact, as an object of the main V.\textsuperscript{18}

A final question, of considerable crosslinguistic interest, is what projection of V may be fronted. One could imagine that the choice of the copied verbal head would dictate, ipso facto, the projection that can be fronted. However, this simplistic view predicts that any language in which [+Top] may attach to heads above the root \( \sqrt{V} \) would allow fronting of arguments together with the predicate. In reality, VP-fronting is attested only in a subset of the languages allowing V-doubling. The picture is unfortunately confused by contradictory reports in the literature.

Modern Hebrew, Brazilian Portuguese and Korean clearly allow either V-fronting or full VP-fronting, with all internal arguments. In Yoruba, the clefted predicate is a nominalized gerund, which consists of either V or the entire VP. On the other extreme, Biblical Hebrew displays bare V-fronting; Vata and Haitian also disallow any argument fronting together with V, although certain aspectual markers and adverbials can be copied. Intermediate cases also exist. Russian, according to Abels 2001, excludes direct objects from the fronted VP (although oblique arguments can be carried along). As for Yiddish, three dialects are described in the literature. According to Davis & Prince 1986 and Källgren & Prince 1989, only bare V-fronting is possible; Hoge (1998) claims that adjuncts and clitics (but no lexical arguments) may be fronted with V; while Cable (2004) reports that any VP-internal material may be part of the topic VP.\textsuperscript{19}

This heterogeneous state of affairs prevents any clear conclusions at the present stage. Still, one could ask what theoretical concepts are required to describe, and hopefully constrain, the various manifestations of V(P)-fronting. Consider a language where only \( \sqrt{V} \)-copying is possible. On the (nontrivial) assumption that bare roots do not take arguments, such a language will disallow argument fronting along with the root, even if some later morphological operation expands this root to a word (V or N). This is essentially Harbour’s (2002) proposal for Haitian and Vata.

Consider nominalizing languages. The difference between Yoruba, where the entire VP is fronted, and Igbo, where a bare V is fronted, is attributed by Manfredi (1993) to a subcategorization property of the nominalizer: \([__V^{\text{max}}}\) in the former, \([__V^0}\) in the latter. This might work for the Kwa/Kru languages, but not for the Yiddish dialects where the fronted predicate is a verbal category, larger than a root but still argumentless. One could imagine some “pied-piping” parameter, fixing the visibility/percolation of the [+Top] feature on/to the maximal projection of V. However, much more needs to be known about the topic/focus strategy of the individual languages, as well as their morphological resources, before a full typological analysis can be developed.

\textsuperscript{18} Manfredi extends this account to Vata and Haitian, where overt morphological evidence for the nominal status of the clefted predicate is significantly sparser; see Harbour (2002) for critical comments on this move.

\textsuperscript{19} Cable’s informant, however, rejects long-distance V(P)-fronting, in contrast to the earlier studies.
5. Head or Phrasal Movement?

In section 4.1 we have established that PI-fronting in Hebrew, as in (41a), involves vP-copying. We now turn to BI-fronting, as in (41b), and ask – what category is fronted?

(41) a. [vP likro et ha-sefer], hu kara.
   to-read ACC. the-book he read
   'As for reading the book, he read'

   b. [a likro], hu kara et ha-sefer.
      to-read he read ACC. the-book
      'As for reading, he read the book'

Logically, there are two possibilities. If $a=V$ in (41b), then V-fronting is a nonstandard case of long head movement (see (21b), (22b)). If $a=vP$, 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, van Reimsdijk 1989, Larson & Lefebvre 1991, Hoge 1998, Holmberg 1999, Harbour 2002, Bastos 2002 and Fanselow 2002. Remnant VP-movement has been proposed, among others, by den Besten & Webelhuth 1990, Grewendorf & Sabel 1994, Koopman 1997, Müller 1998, 2002, Takano 2000, Abels 2001 and Hinterhölzl 2002.

For the Hebrew case, I will adopt the long V-movement analysis.²⁰ Two sets of considerations point to this analysis. First, mounting positive evidence against the remnant VP-movement approach, even in scrambling languages like German; and second, the recent dissipation of the traditional argument against long V-movement.

The remnant VP-movement analysis was originally proposed for German constructions such as (42).

(42) a. Gelesen hat das Buch keiner.
   read has the book no-one
   'Read the book, no one did'

   b. [VP t₁ Gelesen]₂ hat [das Buch]₁ keiner t₂.

²⁰Although, strictly speaking, I will argue that in PI-fronting, the fronted vP is a remnant, containing a trace (copy) of the verb (which had raised earlier to T), that is pronounced as an infinitive; see section 6.1.
First, the object is scrambled out of VP. Then VP (with the internal object trace) is topicalized. This analysis is quite natural for languages like German, where the first step (scrambling) is attested independently of the second step (topicalization). As shown extensively by Müller 1998, a variety of configurational and crosslinguistic properties fall out of this analysis, including the Principle of Unambiguous Domination.\(^{21}\)

However, it is unclear how to transpose the remnant analysis to a language like Hebrew, with no productive 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.), see (43). Re-labelling "scrambling" as "licensing movement" does not advance our understanding of the construction.

\(^{21}\) Unambiguous Domination: In a structure \(\ldots[[A \ldots B \ldots]] \ldots\), A and B may not undergo the same kind of movement (Müller 1998, p. 271).

\(^{22}\) Fanselow's (2002) alternative analysis, following Haider (1990), cannot extend to Hebrew either. It assumes that verbal arguments can be introduced in the projection of the auxiliary verb, as in (i), which forms a sort of extended projection with the participle, allowing the participle to move as a (non-remnant) maximal projection (ii):

\[(i)\] Dass sie [\(\text{vp} \text{ dem Fritz ein Buch [vp geschenkt] hat}\).  
that she the.DAT Fritz a.ACC book given has

\[(ii)\]
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 Á-movement applying to maximal projections. However, all the terms in this dichotomy – head, XP, Á – 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 Á-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. Any observed correlations suggesting such links must be explained on a local basis. For example, the alleged phrasal nature of wh-movement, suggested by (44a), may in fact be explained by pied-piping constraints (which happen to be inoperative in Slavic languages). When inapplicable, as in (44b), these constraints will permit movement of a nonmaximal projection (notice that variable binding in (44b) makes an extraposition analysis for the PP very unlikely).

(44) a. * Whose$_1$ did you wreck [DP t$_1$ computer]?
    b. [How proud]$_1$ was John [DegP t$_1$ [PP of each girl$_2$ ]] during her$_2$ adolescence?

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 (41b) 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 X-movement. Let us turn to the remaining question - Why is it that two copies of the verb are phonologically realized in VP-fronting?

'That she gave a book to Fritz'  
ii. [vP Geschenkt] hat sie dem Fritz ein Buch t${}_{\text{vP}}$.

Fanselow argues that the parameter permitting projections like (i) (set positive in German, negative in English) is the same parameter responsible for "scrambling", reanalysed as base-generation of free word-orders. Notice that this account crucially ties the possibility of long V-movement to the presence of an auxiliary verb; yet no such link is attested in Hebrew (where most tenses are synthetic), or for that matter, even in Yiddish, where long V-topicalization can apply to synthetic verbs. Moreover, the "scrambling" parameter predicts Hebrew to pattern with English and not with German in disallowing long V-movement, contrary to fact.

23 Harbour (2002) makes use of this ambiguity in analysing (Á-type) predicate clefts in Haitian.

24 I will continue to use the neutral term VP-fronting when no relevant distinction between BI-/PI-fronting is intended.
6. A PF-algorithm

In this section I spell out the PF algorithm that applies to syntactic chains to obtain their phonetic expression. There are two ingredients to this algorithm: A PF-internal recoverability constraint, preserving phonetic information; and an economy preference principle, weeding out redundant copies. Their interaction explains the V-doubling phenomena without recourse to non-modular/global considerations.

6.1. P-Recoverability and Economy of Pronunciation

That the lower verbal copy is obligatory in V(P)-fronting is shown in (45a). Notice that when the fronted category is a true infinitival complement, a normal (unpronounced) trace is left (45b):

(45) a. le'hasbir et ha-kišalon, hu lo *(hisbir).
   to-explain ACC. the-failure, he not *(explain)
   'As for explaining the failure, he didn't explain'

   b. [le'hasbir et ha-kišalon], hu lo hicliax t1.
   to-explain ACC. the-failure, he not managed
   'To explain the failure, he didn't manage'

It is also possible, although trickier, to show that the higher verbal copy is obligatory in V(P)-topicalization. A complication arises because the string [Object ... Subject ... Verb] can be (more simply) analysed as object topicalization, rather than topicalization of a remnant VP with an unpronounced head (i.e., [[t, Object]1 ... Subject ... Verb... t1]). In order to force the latter structure, one needs to look at cases where the simple object-topicalization analysis is independently ruled out. One such case involves finite complements, which strongly resist topicalization in Hebrew (more so with particular verbs). Consider:

(46) a. * [še-hu he'eliv et Rina], Gil hicta'er t1.
   that-he insulted ACC. Rina Gil regretted
   'That he had insulted Rina, Gil regretted'

   b. *([le'hicta'er) še-hu he'eliv et Rina], Gil hicta'er t1.
   *(to-regret) that-he insulted ACC. Rina Gil regretted
   'As for regretting that he had insulted Rina, Gil regretted'
CP-topicalization of the complement of hicta'er 'regret' is impossible (46a); hence, the only remaining analysis for (46b) without the infinitival verb – which is string-identical to (46a) – is topicalization of VP with an unpronounced head. The fact that this option is also ungrammatical argues for obligatory phonological spell-out of the high verbal copy. The same conclusion can be drawn from topicalization of VPs with two internal arguments. Generally, double topicalization of the two arguments is possible (if awkward), however, sometimes it is not. Consider the verb promise:

(47) a. *[le-Rina]₁ [le'hagia ba-zman]₂, Gil hivtiax t₁ t₂.
    to-Rina to-arrive in-the-time Gil promised
    'Rina, to arrive on time, Gil promised'

b. *[le'havtiax) le-Rina le'hagia ba-zman], Gil hivtiax t₁.
    *(to-promise) to-Rina to-arrive in-the-time Gil promised
    'As for promising Rina to arrive on time, Gil promised'

The upstairs infinitival verb must be pronounced in (47b), since without it the structure would receive the double topic analysis of (47a), which is also ungrammatical. Thus, both copies of V in V(P)-topicalization are obligatorily spelled out.

How, then, can we account for the obligatory pronunciation of the two verbal copies? To answer this we must develop further the notion of chain resolution outlined in section 1. Recall that chain resolution is constrained by the MCR.

(48) 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 the following two conclusions:

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

For example, according to Franks 1998, 1999, second-position clitics in Serbo-Croatian move successively to C⁰, and are normally spelled out in that position. However, if the highest copy cannot cliticize to a prosodic word to its left (e.g., when it follows an intonational boundary of an appositive), the next highest copy will be pronounced. According to Bobaljik 2002, V and T must be string-adjacent in order for morphological merger to take place; if Object Shift
targets a position between V and T, the higher copy of the object must be deleted at PF to guarantee successful V-T merger.

Notice that both explanations appeal to (49b) in order to sanction PF-deletion of high copies. But what forces pronunciation of the lower copy in these examples? Clearly, it is not (49a), since the low position of neither clitics nor objects is associated with obligatory phonological spellout; indeed, in many circumstances it is not pronounced. Presumably, low pronunciation here 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 clitic/object 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. Is there a different notion of recoverability compatible with the MCR? Suppose 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.

\[(50)\] \textbf{P-Recoverability (1st version)}

In a chain <X₁, ..., Xᵢ, ..., Xₙ> formed by movement of X, where X has phonetic content, at least one copy must be pronounced.

\[(50)\] 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.²⁵

Suppose now that the "phonetic content" is not strictly specified on X, but rather on the position to which X moves. In other words, if X adjoins to H, or moves to its specifier, and H imposes some phonological requirement P on X's position, recoverability demands that the position associated with P be pronounced.

\[(51)\]

a. \[
[\text{HP} \ [X₁ \ [\text{H}P \ ]] \ [\ldots \ Xₙ \ ]]
\]

b. \[
[\text{HP} \ X₁ \ [\text{IF} \ H₀ \ [\ldots \ Xₙ \ ]]]
\]

V-to-T raising could be viewed as an instance of (51a): inflectional features must be spelled out, or alternatively, T₀ is an affix requiring a lexical host.²⁶ The "EPP" requirement of interrogative C in English instantiates (51b) (the specifier must be spelled out).

²⁵ This is incompatible with Pesetsky's (1998) analysis of null operator chains in relative clauses as resulting from deletion of a wh-word (following Chomsky 1977). If I am correct, the null operator must be available as an independent formative in the grammar. Notice that some null operators must be so, namely, those that have no overt counterpart: the degree operator in comparative deletion or the operator involved in predicate clefts (John is smarter Op₁ than I thought he was t₁, It is taste whiskey Op₁ that I'm sure John never will t₁). Likewise, the null operator binding wh-in-situ inside islands is not produced by movement.
Let us now define:

(52) X is associated with phonetic content iff:
   a. X has phonetic content, or
   b. X is in a position specified with some phonological requirement.

We can now generalize P-recoverability to cover both scenarios.

(53) P-Recoverability (final version)
   In a chain \(<X_1, \ldots, X_i \ldots X_n>\), where some \(X_i\) is associated with phonetic content, 
   \(X_i\) must be pronounced.

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 (53), 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, (53) 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 being semantically empty. P-recoverability, unlike previous alternatives (see (5)), respects the MCR. However, it is not intended to capture all the effects of traditional recoverability constraints, which clearly are sensitive to semantic information. Rather, restricting attention to the problem of chain resolution, I suggest that most or all of the job of S-recoverability can be handled by P-recoverability, without empirical loss and with significant conceptual benefit.

In the vast majority of cases, only one position in a chain is associated with phonetic content, hence pronouncing a single copy complies with (53). For example, in (54) it is the top copy alone that occupies an EPP-position, so the lower ones are phonologically deleted.\(^{27}\)

(54) a. John seemed \textbf{John} to be noticed \textbf{John}.
   b. Who do you think \textbf{who} Mary likes \textbf{who}?

In principle, however, nothing in the statement of (53) precludes multiple pronunciation of chain copies, provided that each of these copies is demanded by PF. This situation arises only in special circumstances – V(P)-fronting in Hebrew, for example. Before we turn to the

\(^{26}\) Notice that the need of T to attach to a lexical host obtains whether the inflectional features in T themselves are lexical (as in Hebrew verbal clauses), or null (as is often the case in English \textit{do-support}).

\(^{27}\) Partial \textit{wh}-movement may result in multiple phonological copies (see Fanselow & Čavur 2001 for a recent treatment).
details, let us consider what happens in normal circumstances. In particular, when only one copy is required by PF, why must all the other copies be deleted? Evidently, alongside the lower bound on chain pronunciation – P-recoverability – there ought to be some upper bound, otherwise chain copies will never fail to be pronounced. The most intuitive candidate in this domain is *economy*; here, as elsewhere, whatever is not required is forbidden.

(55) *Economy of Pronunciation*

Delete all chain copies at PF up to P-recoverability.

(55) rules out pronunciation of the lower (italicized) copies in (56).

(56) a. * John has not *has arrived yet.
    b. * Mary was invited *Mary to the party.
    c. * What did John buy *what?

Taken together, (53) and (55) dictate that the lower copies in (56) be phonologically deleted, since i) their phonetic content is spelled out at the higher copy, and ii) no phonological requirement is imposed by their environment (as opposed to the environment of the higher copies).

Notice that the qualification "up to P-recoverability" in (55) serves as a 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)-topicalization in Hebrew is a case where the overriding effect of P-recoverability is strikingly visible. Consider a typical example. The structure of (57a), in fact, contains three copies of V, only two of which are pronounced (57b).

(57) a. lirkod, hu rakad.
    to-dance, he danced
    'As for dancing, he danced'

28 Notice that we have to assume actual deletion of p-features (as opposed to mere “failure to pronounce”) on the assumption that interface representations are subject to Full Interpretation: if PF does not tolerate unpronounced p-features, then those features must be eliminated prior to pronunciation.

29 Previously, (56b,c) were ruled out by the θ-criterion (and (56b) also by the Case Filter). This was inevitable in a framework where a single copy fed both PF and LF. If, however, the lower copies in (56b,c) are visible only to PF, the θ-criterion should be oblivious to their presence.
PF-deletion applies to the shaded constituents. Let us refer to $[\sqrt{V}+v]$ 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 (57b)): 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 (57b) 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, or the "Stray Affix Filter" (Hebrew lacks any do-support strategy). 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 (15), is crucially imposed on $V$, the head of the fronted VP. Thus, failure to pronounce any of these two $V$-copies would violate (53). By contrast, the lowest $V$-copy is not associated with any phonological requirement, hence the economy condition (55) demands its deletion.30

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.

30 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 (Koopman 1997 makes 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).
That the fronted V-copy is spelled out due to phonological requirements is suggested by the prosody of the construction in Hebrew. Further evidence against a semantic/pragmatic account is provided by languages that appear not to impose these phonological requirements, allowing empty-headed fronted VPs (see next section); a semantic/pragmatic parameter is much less likely. Concerning the lower V-copy, the phonological motivation for its occurrence becomes patent in minimal pairs like the following.

(58) 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.A to-the-project our he not was (?? useful.A) never

'As for being useful to our project, he never was useful'

(58a,b) are semantically indistinguishable; they differ only in that the predicate is a synthetic verb in (58a) but an [Copula+Adj] complex in (58b). Crucially, the lower V-copy must be pronounced in the former, whereas the lower A-copy must not be pronounced in the latter.31 The contrast follows from the fact that it is the lexical V itself that raises to T in (58a), spelling out tense/agreement features. By contrast, in (58b) it is the copula, not the adjective, that spells out those features; the lower adjective 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.32

An interesting implication of this analysis is that there is no notion of "phonological movement" independent of Copy\textsubscript{p}. The head movement of V-to-T in (57b) does not rob V of its p-features, since those features are copied again when the entire VP is fronted, and spelled out once more. Thus, the reason that movement usually leaves unpronounced traces is not because it "takes away" the p-features of the trace, but simply because independent PF

31 In fact, repeating the low adjective copy in (58b) is marginally possible; however, the utterance sounds unbearably redundant. That it is not strictly ungrammatical strongly suggests that the constraint forcing low deletion is an economy constraint (hence, defeasible).

32 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.
principles (normally) require high pronunciation. This picture is expected under the "Copy & Delete" theory of movement, but somewhat mysterious under the older, sequential theory of movement.

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 of these 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 (53) and (55), which are warranted by very general considerations, should affect pronunciation of chain copies.33

Whether this simple picture can be maintained in general is an open question. An interesting construction also involving double pronunciation of a head is "split topicalization" (van Riemsdijk 1989, Fanselow & Čavar 2002). In German, singular indefinite DPs must be introduced by an overt determiner or quantifier. When stranding a quantifier, a topicalized NP will show up with its own determiner, which can never occur adjacent to the quantifier (59a); a topicalized PP will double its head (59b).

(59) a.  Einen alten Professor kennt sie keinen.
      an old professor knows she no
      'She knows no old professor'

   b.  In Schlössern habe ich noch in keinen gewohnt.
      in castles have I yet in no lived
      'As for castles, so far I haven't lived in any'

There is compelling evidence that the parts of the discontinuous phrase in such examples are related by movement. Van Riemsdijk (1989) construes the "regenerated" determiner as a response to a surface well-formedness condition on DPs, and Fanselow & Čavar (2002) extend his insight to split PPs. Importantly, the form of the regenerated determiner is fixed to einen, the least marked member of the D category; this strategy may be dubbed "D-support". Alternatively, the lexical head may be doubled, as in the split-PP and the VP-fronting cases. More generally, V- D- and P-doubling are forced whenever more than one position in a chain is associated with a PF requirement.

33 A anonymous reviewer asks why standard head movement – say, V-to-I-to-C – does not leave a visible intermediate copy in I, whereas the short movement of V-to-I does. The answer must assume, as is standard, that head movement of this type is adjunction, carrying along every head on the way. If I raises to C (together with V), then both the P-requirement of I and that of C can be satisfied at C.
6.2. Headless Remnant VPs

In discussing (57b) I assumed that the phonological specification associated with the topicalized VP must be spelled out on its head. For Hebrew, at least, this reflected the observation stated in (15). One wonders whether this situation obtains universally or not: can there be languages/constructions that realize the topic phonology on a non-head constituent?

The literature provides examples of this sort, although the status of the relevant data is somewhat unclear. Takano (2000) cites (60a) (from Haider 1990) as evidence for the impossibility of headless remnant VPs in German; however, Müller (1998: p. 260) provides grammatical examples like (60b).

(60) a. * [VP Ihr ein Buch ti ] gabt Hans tVP.
   her a book gave Hans
   'Hans gave her a book'

   b. (Ich glaube) [VP Kindern Bonbons ti ] gibt man besser nicht tVP.
   (I believe) children.DAT sweets.ACC gives one better not
   '(I believe that) give sweets to children, one had better not'

Takano attributes the ungrammaticality of examples like (60a) to the "invisibility" of traces to attraction by higher probes (Chomsky 1995). Takano suggests (p.c.) that where headless VP remnant movement is allowed, as in (60b), the preceding V-movement may have been phonological, leaving the formal features of the base V copy visible to attraction. However, it is not clear what independent motivation can be given to the alleged distinction between syntactic and phonological V-movement, especially in closely related pairs like (60a,b). Furthermore, considerations of chain resolution (in particular, the PSCR discussed in section 1) argue against the option of phonological movement (see also Bošković 2001).

One could attempt to relate the German-Hebrew contrast in the pronunciation of the fronted V-copy to the VO-OV contrast; perhaps only the left edge of the topic must be spelled out. However, constructions similar to (60b) have also been reported in VO languages like English (Culicover & Rochemont 1990) and French (Dekydspotter 1992).

(61) a. [VP ti into the room nude] walkedi John tVP.

34 G. Müller (p.c.) points out that VP fronting in German is particularly degraded by several factors when the VP is headless: i) marked word order in the fronted VP; ii) initial unstressed pronoun; iii) lexical (as opposed to auxiliary) verb in C. Notice that (60a) involves the last two factors. The "fragile" status of the data and the current level of understanding make any strong claims in this domain premature.
b. \[[VP \text{ t} \text{ sa tirade soignueusement}] \text{ elle énonça\textit{t}} \text{ VP.} \]

her part carefully she recited

'Recite her part carefully, she did'

It is not entirely clear how productive these constructions are. To gain a better understanding of the crosslinguistic picture, one would need to study carefully the prosodic and intonational profile of topicalization (and locative inversion) in different languages, a task outside the scope of this paper.

7. 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 \textit{copying}, rather than \textit{removing}, phonological and morphological information. The fate of that information – expression or deletion – is decided at PF.

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

(62) a. \textit{PI-fronting}

\[
[\text{TopP} [\text{VP SUB} [V \text{ V ARG}]]; \text{Top}^0 [\text{TP SUB V}^0+T^0 [\text{VP SUB V ARG}]]; ]
\]

b. \textit{BI-fronting}

\[
[\text{TopP} V_i \text{ Top}^0 [\text{TP SUB V}^0+T^0 [\text{VP SUB V ARG }]]]
\]

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 (53). 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 (55), normally deleting all copies but one, permits double pronunciation. Various independent arguments, both internal to Hebrew and crosslinguistic, strengthened the claim that it is PF considerations \textit{alone} that determine copy pronunciation. This result accords well with the MCR.

(63) \textit{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 (62b) and argued instead for a bare V-fronting analysis, no longer inconsistent with current conceptions of phrase structure. An intricate typological picture is opened up by the interaction of parametric choices (root vs. category copying, full vs. some/no pied-piping, default vs. nominal morphology), most of which are fixed at PF, as we expect under the present approach to chain resolution. Much more research is called for in this domain.

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 location. Residual instances of recoverability, I suggested, may be better viewed as constraints on possible interpretations rather than on possible deletions.

Obviously, this analysis makes some strong claims that could turn out to be untenable. The MCR implies that all PF-LF dependencies in chain resolution are illusory, and explicable without reference to cross-interface conditions. One might suspect that an intuitive generalization is being missed this way, namely, that by and large, languages prefer to pronounce and interpret elements in the same position.

I can only speculate that this generalization expresses a true feature of language design without implicating any specific computational mechanism. In other words, functional usability did and does affect language in favoring grammars that minimize LF-PF discrepancies. Yet the grammatical mechanisms achieving that goal respect the MCR (e.g., by associating a p-feature with a position required by LF; the EPP is a classical example). That this line of research is feasible was argued in this paper. Whether it is profitable, remains to be seen.

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