

Where it's [at]: A phonological effect of phasal boundaries in the construct state of Modern Hebrew



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Abstract

The consonant of the feminine marker /at/ of Modern Hebrew is absent from certain configurations, but present in others (N-at+N constructs). In this paper, I propose to regard this phenomenon a case of allomorphy, conditioned both phonologically and morpho-syntactically. The consonant is analyzed as floating. In consequence, additional skeletal support is needed to explain its realization. One possible, independently motivated source for such support is Lowenstamm's (1996) "initial CV": the floating /t/ attaches to the initial CV of the following word. Still, the question is raised why this happens mainly in that very specific configuration. N-at+N constructions are therefore compared to the minimally different Nat+Adj, and four differences are singled-out. After a prosodic solution is judged insufficient, syntactic structures are proposed for both constructions and the four differences are related to phase-structure, under the assumption that D is the first phasal head of the nominal architecture. Adopting Scheer's (2009) claim that Lowenstamm's initial CV marks phase boundaries, rather than word-boundaries, it is then shown that the /t/ remains afloat exactly when the phase structure motivated by the four differences renders the initial CV of the following phase inaccessible; but if phase structure allows it, the same /t/ can be linked to that following CV. The logic behind the allomorphy is thus both phonological (it relies on autosegmental analysis) and morphosyntactic – it follows from phase structure. On a general level, if so, evidence is adduced to the correctness of Scheer's proposal. On a more language-specific view, an elusive case of allomorphy, hitherto regarded as historical, receives synchronic motivation in the consideration of general principles of form and structure interrelations.

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1. Introduction

Modern Hebrew, spoken in Israel, is a Semitic language. Two aspects of its morphology have featured extensively in generative literature: non-concatenativity, whereby affixes and bases are interdigitated rather than concatenated, and state morphology, which will be the topic of this paper. A concatenative process juxtaposes a nominal item (noun or adjective) and a modifying noun and establishes a genitive relation $N_{\text{head}}-N_{\text{modifier}}$, which is marked only by this juxtaposition. Nouns heading such constructions are said to be in a different "state" than those that appear outside the construction. While nearly all Semitic languages employ this process (or at least some remnant of it), its manifestation in Modern Hebrew is especially interesting, because of several semantic, syntactic, prosodic and morphological reflexes of state morphology. This paper will concentrate on the morphological reflex, more specifically on the appearance of a special form of the feminine suffix in this construction.

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1.1. The problem

As shown in (1), there are four singular feminine markers and one feminine plural marker. All feminine markers except one (1d) carry the suffix *-t*.

(1) Feminine markers in Modern Hebrew¹

	Singular	Plural	
a.	pax-it	pax-iy-ot	'can'
b.	xan-ut	xan-uy-ot	'shop'
c.	rakév-et	rakav-ot	'train'
d.	pin-a	pin-ot	'corner'

However, it is only in the citation form that the marker *-a* stands out in this respect. When the adjectival *-i* is added to a feminine noun ending in *-a*, a [t] appears between the two markers:

(2) [t] (regularly) appears on *-a* suffix before adjectival *-i*²

	Singular		Adjective	
a.	pin-a	'corner'	pin-at-i	'of the corner'
b.	noc-a	'feather'	noc-at-i	'feather-like'
c.	tkuf-a	'period'	tkuf-at-i	'periodic'
d.	hatxal-a	'beginning'	hatxal-at-i	'initial'

There are no other suffixes which regularly attach to feminine nouns ending in *-a*. Of the four other productive native suffixes, three (*-an*, *-ay*, *-ut*) are very rarely combined with such bases. The fourth, the diminutive *-onet*, seems to attach directly to the base stem (*pin-onet* 'small corner', cf. 2a; see Bat-El, 1997 for a different view). There are no native consonant-initial nominal suffixes in spoken Modern Hebrew.³

Since [t] is cross-linguistically the least marked consonant, one might be tempted to analyze the [t] in (2) as epenthetic, inserted to avoid hiatus. This is improbable, because when *-i* is added to non-feminine words ending in a vowel, it is [ʔ], not [t], which appears: *yafo* 'Jaffa' – *yafoʔi* 'from Jaffa', *cava* 'army' – *cavaʔi* 'military'.

It seems safe to say, on the basis of (2) alone, that [a] and [at] are two allomorphic realizations of the same morpheme. Indeed, this is the traditional view for Biblical Hebrew, and the one adopted by Bat-El (1989), to the best of my knowledge the only generative work which touches on this topic in Modern Hebrew. Based on (2), the conditioning of the allomorphy is then entirely phonological: the underlying representation is /-at/, with /t/ emerging before vowel-initial suffixes. Proponents of this view still have to explain the disappearance of the /t/ word-finally.

To complicate matters, there is one other important environment where this suffix takes the form [at], namely "construct nouns". As mentioned above, construct nouns are head-initial N_{head}-N_{modifier} compound-like configurations, with default

¹ The transcription throughout the paper is more or less phonetic. Deviations from the IPA are c = IPA [tʃ], š = IPA [ʃ], r = IPA [ʁ]. Stress is marked by a rising accent when not final.

² In some relatively rare cases, the entire feminine suffix is omitted: *agad-a* 'legend' *agad-i* 'legendary'. However, the strategy in (2) is by far more productive. Moreover, the two strategies are not exclusive. For instance, the adjective *medin-i* 'political', derived from the noun *medina* 'state', does not block *medinat-i* 'of state'. Like *medin-i*, the adjectives where the *-at-* disappears tend to have denotations that are non-compositional with respect to that of their bases.

³ The list in this paragraph can be supplemented by the set of possessive suffixes of Standard Hebrew, in wide use in the press, literature and popular music, but nevertheless absent from everyday speech. When these suffixes are attached, the *t* always surfaces: *pinat-o* 'his corner'. Interestingly, some of these suffixes are consonant-initial, and the *t* surfaces even before them: *pinat-xa* 'your corner'. This may be due to the additional templatic space between the stem and the suffix, which is also reflected in the fact that the consonant of the suffix is spirantized, whereas in the standard register it should be a stop. Because these suffixes are not part of the spoken language, I do not investigate this issue further.

genitive denotation. As shown in (3), when the feminine noun heads a construct noun, a [t] appears after the *-a*. Notice, in addition, that this alternation is extremely productive: even [a]-final loanwords such as (3e), which are always interpreted as feminine, exhibit this [t] in their “Construct State”.

(3) [t] appears on *-a* suffix in the Construct State (=CS)

	Free State (=FS)		CS	
a.	pin-a	'corner'	pin-at rexov	'street corner'
b.	noc-a	'feather'	noc-at barvaz	'duck feather'
c.	tkuf-a	'period'	tkuf-at mitun	'period of recession'
d.	hatxal-a	'beginning'	hatxal-at seret	'beginning of a movie'
e.	dilém-a	'dilemma'	dilém-at otipron	'Euthyphro's dilemma' ⁱ

ⁱA question asked of Euthyphro by Socrates, which can be reformulated in modern terms as: “Is what is morally good commanded by God because it is morally good, or is it morally good because it is commanded by God?”

The appearance of [t] in the CS in (3) cannot be motivated phonologically, because it occurs regardless of whether the following noun begins with a vowel or a consonant. Although, as we will see in Section 4, much research has been devoted to the Hebrew CS, none of it treated the morpho-phonology of this construction. The appearance of feminine [t] in the CS, one is left to assume, is generally treated as an arbitrary fact.

It is important to add that the CS is the only environment where [t] emerges before another word. In the seemingly phonologically identical N+Adjective concatenations in (4), the noun appears in its “Free state” (FS), i.e. its citation form:

(4) [t] does not appear on *-a* suffix in seemingly phonologically identical N+Adj

a. CS (N _{head} -N _{modifier})		b. FS (N+Adj)	
pin-at	kal-a	pin-a	kaš-a
'bride-corner'		'difficult corner'	
noc-at	xasid-a	noc-a	xamud-a
'stork-feather'		'cute feather'	
tkuf-at	šan-a	tkuf-a	šon-a
'period of 1 year'		'different period'	

One may of course claim that the /t/ floats word-finally, and that the first N in the N_{head}-N_{modifier} construct is not word-final in the relevant sense. The question remains, however, as to why the same segment would exhibit one behavior before a vowel-initial suffix (*tkuf-at-i* ‘periodic’) and in the N_{head}-N_{modifier} configuration (*tkuf-at* mitun ‘period of recession’), but another behavior word-finally (*tkuf-a* ‘period’). In other words, whereas it is clear that any unifying account must assume that the underlying representation of [a] is /at/, the following questions remain unanswered:

(5) Questions

Q1. Why doesn’t the *-t* always surface?

Q2. Why does the *-t* surface in the Construct State?

As mentioned above, I know of no principled attempt at answering these questions.

1.2. *Insufficient answers*

Before I begin to argue for my own answers to the questions in (5), it is worth to consider what may not count as a satisfactory answer. First, it is not enough to say that the /t/ of /at/ “floats”. That begs the question of *why* it floats, that is, what is the representational configuration that allows it to remain in the grammar as a floating consonant. Equally unfruitful would be an explanation which stops at the generalization of the preceding section, namely that /t/ floats word-finally, but in the “Construct State” it is not word-final. Whether one defines “word” morpho-syntactically or prosodically, assuming that the *-t* floats, one has to ask what it is that allows it to float word-finally, but does not hold in the Construct configuration.

Why can't a segment float word-internally? And why may it remain afloat word-finally? In other words, floating at the edge but not elsewhere is the problem, not the solution.

Another insufficient answer is to claim that [at] is the “Construct state allomorph” of [a]. Under this view, the allomorphy here is not phonologically conditioned, and the underlying representation is not /at/ in both FS and CS: rather, speakers know that in the CS configuration, the morpheme that is realized as [a] in the FS takes the shape [at]. This is a bad answer for several reasons. First, much like the previous answer, it is little more than a description of the facts. Second, it completely ignores the fact that [t] is the general feminine marker, and that [a] has the same [at] realization before adjectival *-i*. And finally, the “Construct State” is not a primary linguistic notion. As mentioned above, much work in syntax has been devoted to proving that syntactically, the CS construction follows what are essentially universal structures; claiming that Hebrew has a CS allomorph begs the question of what in the construction forces – or at least allows – this non-phonologically conditioned allomorphy.




The two questions in (5) above remain valid. I will now attempt to answer them in the following fashion. In Section 2, I will present the CVCV framework and show how it straightforwardly answers **Q1**. In Section 3, I will suggest that Lowenstamm's (1999) “initial CV” is the key to answering **Q2**, which as a consequence will be reformulated. In order to answer the reformulated question, the $N_{\text{head}}-N_{\text{modifier}}$ and $N+\text{Adj}$ configurations will be compared in Section 4. A solution based on prosody will be considered and judged insufficient, too. Syntactic structures will then be proposed for the two constructions in Section 5, based on the different distribution of the definite marker in the two constructions. Phase structure is shown to account for the remaining differences. Finally, in Section 6, Scheer's (2009) interpretation of the initial CV will be shown to answer **Q2**, by assuming a phonological correlate of Chomsky's (2001) Phase Impenetrability Condition: phonological processes do not hold across phase boundaries.

2. CV as the only skeletal constituent, the answer to Q1

In this section, I will show how the framework of Government Phonology (Kaye et al., 1990) in its CVCV version (Lowenstamm, 1996; Scheer, 2004) accounts for the floating of /t/ in the FS.

This approach adopts the multi-tiered, autosegmental representations of McCarthy (1981) and Clements and Keyser (1983), with the crucial difference that the skeletal tier (i.e. the CV tier) consists of strictly alternating CV-units. Empty V-slots, also called empty nuclei, have to be governed by full nuclei to their right in order to remain unrealized (6a). If they are not thus governed, they are realized as epenthetic vowels (compare 6b,c):

(6) CVCV, government, and empty nuclei

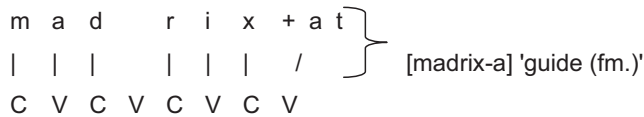
Modern Hebrew	Palestinian Arabic	
a. [madrix] 'guide'	b. [binti] 'my daughter'	c. [binet] 'daughter'
m a d r i x	b i n t i	b i n t
C V C V C V C V	C V C V C V	C V C V C V
		

All the representations in (6) have a final empty nucleus. Such nuclei may remain empty without being governed, but may also be filled (see Kaye et al., 1990 for the original proposal regarding final empty nuclei).

A direct consequence of the two-tiered approach is that morphemes can be represented as being only skeletal, or only segmental etc. (for a discussion of full range of possibilities, see Bendjaballah and Martin, 2008). Representing an affixal morpheme as strictly segmental has the consequence of it depending on its base for skeletal support. If that support is only partial, part of the morpheme will remain afloat.

Now recall **Q1**: Why doesn't the feminine *-t* always surface? As we've established, the suffix is underlyingly /at/. The fact that part of the suffix is unrealized indicates that the suffix does not have its own (full) skeletal support. Instead, it is parasitic on the skeleton of its base. Given the final empty nuclei of CV theory, it is predicted that it is the consonant, and not the vowel, that will remain afloat:

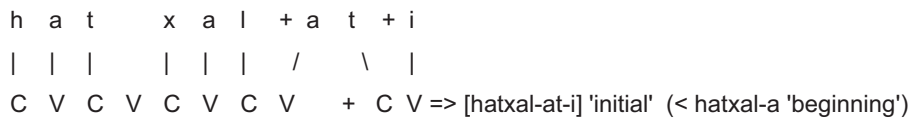
- (7) /at/ does not have its own skeletal support; /t/ remains afloat



The answer to **Q1** is thus simple: The /t/ of /at/ floats because /at/ does not have its own skeletal support. Because consonant-final bases actually end in an empty nucleus, the /a/ of the suffix may be associated to that position and realized; but the /t/ remains without support and is not realized. In other words, it is a consequence of the theory that consonants – rather than vowels – will float at the right edge of words.⁴

Of course, if further derivation provides skeletal support, then the floating /t/ may be retrieved. We have seen such cases in the form of the adjectival suffix -i:

- (8) The floating /t/ finds support in the skeleton of an additional suffix



To summarize this section, given word-final empty nuclei, and given a strictly segmental suffix /at/, it is only expected that /t/ will remain afloat if no other material is available. This answers **Q1**. It also points the way toward answering **Q2**, namely “why does the -t appear in the construct state?” In the Construct State, there must be additional skeletal material. But this is only the beginning of an answer, as we will start to see in the next section.

3. Initial clusters and CV theory: the initial CV, problematizing Q2

In order to answer **Q2**, it is necessary to introduce [Lowenstamm's \(1999\)](#) proposal, according to which “words” begin with an empty CV unit. The original set of data used to argue for this view comes from initial consonant clusters.

As is well known, languages differ with respect to the set of allowed initial clusters. Some languages, like Biblical Hebrew, do not allow initial clusters at all. Others, like French (9a), allow only rising sonority in initial clusters; a third group, less well-understood, is represented by Modern Hebrew (9b), which only bans clusters of falling sonority. Finally, some languages present no sonority restrictions on initial clusters (9c) (T= [–sonorant], R= [+sonorant]):

- (9) Languages differ with respect to the set of allowed initial clusters

a.		b.		c.			
French		Hebrew		Moroccan Arabic		Czech	
trou	'hole'	tluš	'coupon'	brid	'cool down'	bratr	'brother'
bleu	'blue'	ktav	'writing'	bka	'cry'	ptak	'bird'
clou	'nail'	gdud	'regiment'	rbit	'bind'	rtu	'lip (gen.sg)'
gris	'grey'	rexuš	'property'	lga	'find'	lva	'lion (gen.sg)'
*kt, *kv, *gd, *lv, *rd...		*rl, *lt, *nt...		Anything goes!!!			
TR, *TT, *RT		TR, TT, *RT					

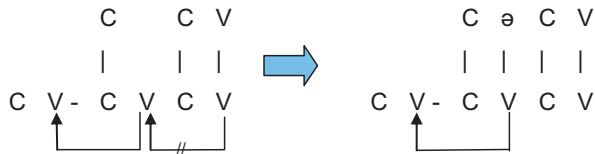
[Lowenstamm \(1999\)](#) proposes to distinguish first between languages that restrict initial clusters and languages that do not restrict them. In the former, it is claimed, words are preceded by an empty CV unit, whose nucleus must be governed (but whose onset may remain empty). Thus, in languages that do not allow initial clusters at all, the nucleus engulfed by the two

⁴ Floating consonants are not a novel proposal. They have famously been used to account for *liaison* effects ([Encrevé, 1988](#)).

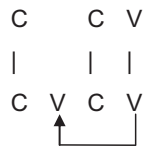
consonants must be realized in order to govern the nucleus of the initial CV (10a). In “anything goes” languages, on the other hand, words are not preceded by an initial CV (10b).

(10) Lowenstamm (1999): the parameter of the initial CV site

a. Language type: no initial clusters - initial CV exists



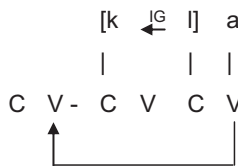
b. Types III: anything goes => no word has initial CV



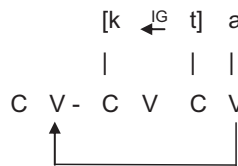
In those languages that do allow a sub-part of possible initial clusters, such as French and Modern Hebrew, the initial CV also exists. In these languages, the initial cluster creates a domain above which the nucleus of the initial CV can be governed. Such a domain is created whenever a relation of Infrasegmental Government (IG; essentially the sonority sequencing principle) holds between the members of that cluster (see [Scheer, 2004](#)). To illustrate, in (11a,b) there is IG between the members of the cluster, and the initial CV may be governed above it; but in (11c) no such relation can be achieved, and there is no initial cluster (Instead, the sandwiched nucleus will be realized in order to govern the preceding nucleus).⁵

(11) Modern Hebrew, Type II

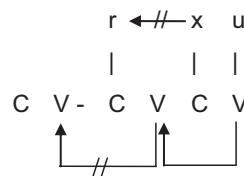
a. klaf 'card'



b. ktav 'writing' ⁵



c. *rxuš => **rexuš** 'property'



To summarize this slight digression, it has been proposed, as part of a study of initial clusters, that there is an initial CV preceding every word in languages that do not allow all clusters word initially. Modern Hebrew is such a language, and must therefore have this initial CV site.

Now let us return to the problem. As the repeated data in (12) recall, the /t/ of /at/ appears when the feminine noun is in the CS, but not when it precedes an adjective:

⁵ As a reviewer notes, within [Scheer's \(2004\)](#) approach, the structure in (11b) is not well-formed. Only [+sonorant] consonant may govern preceding [–sonorant] ones, and in (11b), both consonants are [–sonorant]. I acknowledge this problem, and do not discuss it further, as the range of initial clusters in Modern Hebrew is not the topic of this paper. Moreover, as mentioned in the text, that range is not well-understood. All that having been said, Modern Hebrew is clearly not an “anything goes” language in this respect: the argument for the initial CV site thus holds for this language, too.

(12) Phonologically unmotivated /t/ in the MH CS; not in FS (e.g. N+Adj).

	CS (N+N)		FS (N+Adj)	
a.	pin-at kal-a	'bride-corner'	pin-a kaš-a	'difficult corner'
b.	noc-at xasid-a	'stork-feather'	noc-a xamud-a	'cute feather'
c.	tkuf-at šan-a	'period of 1 year'	tkuf-a šon-a	'different period'

Q2 asked why the /t/ surfaces in the CS. We may now use the initial CV to answer this question: the /t/ docks onto the initial CV of the following word, as (13) demonstrates.

(13) The floating /t/ docks on the initial CV of the following word (in bold)

p i n a t k a l a
| | | | \ | | | |
CV-C V C V + **CV**-C V C V => pinat kala 'bride corner'

However, if the floating /t/ can be salvaged by the CV of the following word, why does this happen only when the next word is a nominal modifier, i.e. only in constructs? Why is it that when the modifying word is an adjective, /t/ may **not** dock onto its initial CV? All other things being equal, this is a prediction of the analysis, and it is wrong, as portrayed by the bomb sign in the representation of this prediction in (14):

(14) The floating /t/ does **not** dock onto the initial CV of the following adjective

p i n a t k a š a t
| | | | \ | | | |
CV-C V C V + **CV**-C V C V => *pinat kaša (cf. (12a), N+Adj)

Evidently, the access to the initial CV of the next word in the configuration N+Adj is blocked. This leads to the following reformulation of **Q2**:

(15) **Q2** reformulated:

Q2. Why is the access to a following initial CV blocked in N+Adj?

It now becomes important to our analysis to determine the differences between the two configurations, namely $N_{\text{head}}+N_{\text{modifier}}$ constructs and N+Adj. Four such differences are surveyed and accounted for in a uniform fashion in the next section.

4. Comparing $N_{\text{head}}+N_{\text{modifier}}$ and N+Adj

In order to understand the distribution of /at/ in the two different configurations mentioned above, four differences between them will be surveyed in this section. First, we will see that the two configurations differ in their prosodic structure. This difference will lead to one possible answer to Q2, which will nevertheless be judged as only partial. Other differences, regarding definiteness patterns, allomorphy potential and semantic compositionality, will lead to a more unifying analysis.

4.1. Prosody and the prosodic solution

The first difference which will be discussed is prosodic. The prosodic structures of the two configurations are distinct, in that, at least in traditional grammars, $N_{\text{head}}-N_{\text{modifier}}$ constructions have one main stress, whereas N+Adj have two main stresses. In $N_{\text{head}}-N_{\text{modifier}}$, the original stress of N_{head} is secondary to that of the N_{modifier} , but in N+Adj, both stresses are equally prominent. A minimal pair is provided in (16):

(16) Stress differences

$N_{\text{head}}+N_{\text{modifier}}$		$N+Adj$
<i>p(a)kid más</i>	vs.	<i>pakíd gás</i>
'tax-clerk'		'rude clerk'

This state-of-affairs, which is attested for Biblical Hebrew, is confirmed on the whole by work on a corpus of Israeli Hebrew (Izre'el et al., 2001, p.c.). The relative proximity of stresses in $N_{\text{head}}-N_{\text{modifier}}$ is further supported by the phenomenon of stress clash. Some such items exhibit stress retraction to avoid such clashes; this is never the case for $N+Adj$:

(17) Stress retraction in $N_{\text{head}}-N_{\text{modifier}}$

original words		$N_{\text{head}}+N_{\text{modifier}}$
a. macáv 'state'	+	rúax 'spirit'
b. oréx 'edit (participle)'	+	dín 'law'
c. yošév 'sit (participle)'	+	roš 'head'
d. ke?év 'pain'	+	roš 'head'
		<i>mācav rúax</i> 'mood'
		<i>òrex dín</i> 'lawyer'
		<i>yòšev róš</i> 'chairman'
		<i>kè?ev róš</i> 'headache'

The evidence therefore points to a tighter prosodic relation between the members of the $N_{\text{head}}-N_{\text{modifier}}$ configuration. Under the fairly standard assumption that the number of main stresses equals the number of prosodic words (see e.g. Adger, 2007 and references therein), one may conclude that in this configuration, both N's belong to the same phonological word. In contrast, the $N+Adj$ configuration involves two prosodic words:

(18) The division of prosodic words in $N_{\text{head}}-N_{\text{modifier}}$ vs. $N+Adj$

$N_{\text{head}}-N_{\text{modifier}}$		$N+Adj$
{p(a)kid mas} _{ProsW}	vs.	{pakid} _{ProsW} {gas} _{ProsW}
'tax-clerk'		'rude clerk'

Having established this difference, let us return to **Q2**: why is the access to a following initial CV blocked in $N+Adj$? Recall Lowenstamm's proposal, according to which an initial CV marks "word" boundaries. Now consider the representations in (19), which integrate the prosodic boundaries in the skeleton. The first two representations are identical to the ones assumed above, in (7) and (13) respectively. In (19a), as in (7), the postulated floating /t/ is not realized in the FS, because it is at the edge of the prosodic word, and no skeletal material is found at its disposal. In contrast, the representation of the CS in (19c), as the one in (13) above, contains no prosodic boundary between the two nouns: the floating /t/ is not at the right edge of the prosodic word, and as a result can be associated with the initial CV of the following word. The representation in (19b) should be compared to (14): in (14), nothing prevented the association of the floating /t/ to the initial CV of the following adjective; but (19b) has a prosodic word boundary right after the noun, and we have seen in (19a) that /t/ cannot be realized in this environment. It is thus lost and the noun of $N+Adj$ is identical to a noun in the FS.

(19) Skeletal and phasal make-up of N vs. $N_{\text{head}}+N_{\text{modifier}}$

a. N	pina 'corner'	b. $N+Adj \Rightarrow$	pina kaša 'tough corner'
	<p>p i n a t</p> <p> </p> <p>{CV - CVCV}ProsW</p>		<p>p i n a t k a š a</p> <p> </p> <p>{CV - CVCV}ProsW {CV - CVCV}ProsW</p>
c. $N_{\text{head}}+N_{\text{modifier}}$	pinat kala 'bride corner'		
	<p>p i n a t k a l a t</p> <p> </p> <p>{CV - CVCV + CV - CVCV}ProsW</p>		

The representations in (19), which combine Lowenstamm's initial CV and the facts from prosody, provide an answer to **Q2**. Assuming that floating segments may not survive at the edge of a prosodic word, then /t/ is in a different configuration in N+Adj and N+N. Only in the latter does it remain at the right edge of the word, and thus has access to the following CV.⁶

However, it is my contention that this cannot be the end of the analysis. The solution raises several questions regarding the interfaces between the linguistic modules of syntax, morphology, phonology and prosody. First, why would the edge of a prosodic word be relevant for association? Suppose that /t/ remained afloat and unsyllabified at the edge of the prosodic word; what would prevent it from attaching to the C position of the following word? At the present stage of the analysis, this is only an assumption, unmotivated by anything besides its putative success. ... Secondly, how does Phonology really “see” this prosodic boundary? As argued for at great length in Scheer (2009, 2012), diacritics such as “}ProsW” are not phonological objects, and thus cannot participate in phonological processes. Finally, what determines the prosodic boundary? It is not the word or lexical unit boundary, since *pinat kala* ‘bride corner’ is clearly composed of *pina* ‘corner’ + *kala* ‘bride’. In other words, how is the difference in prosodic chunking related to the difference between N+N and N+Adj? Is this a coincidence, or a curiosity of Modern Hebrew?

Those readers who do not consider these objections valid are invited to consider the analysis in (19) as definitive. In the rest of the paper, I argue for an alternative analysis, one that derives prosodic boundaries from syntactic structures, and provides a concrete phonological realization for such boundaries. The argument begins in the presentation of three other differences between N+N and N+Adj.

4.2. Three other differences: definiteness effects, allomorphy and meaning

The second difference between the two configurations concerns the distribution of the definite marker *ha*- ‘the’. In $N_{\text{head}}-N_{\text{mod}}$, the definite marker *ha* may appear on either N_{head} or N_{mod} , with different semantic effects. For instance, if *ha*- appears on N_{mod} , the noun may have either a generic or a non generic meaning (20a); but if *ha*- appears on N_{head} , only the generic interpretation is available for N_{mod} (20b). The difference can be illustrated when one considers the two options with the addition of the demonstrative *ha-ze* ‘this’⁷:

(20) Semantic effect of the placement of *ha* in $N_{\text{head}}+N_{\text{mod}}$ + demonstrative.⁷

a. <i>pkid ha-mas ha-ze</i>	‘this tax clerk’	} <i>mas</i> is generic/non-generic
or		
	‘the clerk of this tax’	
b. <i>ha-pkid mas ha-ze</i>	‘this tax clerk’	} <i>mas</i> is generic/*non-generic
but not		
	*‘the clerk of this task’	

Crucially, however, *ha* may not appear on both parts of the construct **ha-pkid ha-mas*. In the N+Adj configuration, in contrast, this is the only option. Indeed, nouns and adjectives overtly agree in definiteness in Modern Hebrew: *ha-pakid ha-gas* ‘the rude clerk’, but never **ha-pakid gas*, **pakid ha-gas*.

The third difference concerns allomorphy. As has already been noted above in the notation $p(a)kid$, in many cases the N_{head} of the construct undergoes some change of form. Interestingly, N_{mod} never undergoes allomorphy.

⁶ As a reviewer notes, something has to be said about the masculine CS cases, where there is no floating segment at the right edge of the head noun. If (19c) is the correct analysis, then what happens to the medial CV in *pakid CV-mas* ‘tax clerk’? One could imagine **pakidd mas*, or **pakid mmas*, or lengthening of a vowel if it ends the first noun or begins the second. However, phonologically long vowels or consonants are not part of the attested surface phenomena in Hebrew, so even if there were lengthening, it would not be heard on the surface. Alternatively, one might simply assume that creating the phonologically marked lengthening of a consonant or a vowel is dispreferred to simply dropping the CV unit, but that the anchoring of a floating consonant overrides such a dropping solution.

⁷ More such differences can be found in Borer (2008, 2013).

(21) Irregular changes in N_{head} of $N_{\text{head}}-N_{\text{mod}}$

	FS		CS	
a.	saxar	'fee'	s xar dira	'rent' (cf. <i>dira</i> 'apartment')
b.	kace	'extremity'	k ce xut	'extremity of cord', 'clue'
c.	yad-áyim	'hands'	yed-ey zahav	'hands of gold'
d.	pras	'prize'	p irs-ey ha-oskar	'The Oscar prize'
e.	ofan-áyim	'bicycle'	o fn-ey harim	'mountain bicycle'
f.	xaxam	'wise'	xax m -ey xélem	'the wise men of Chelm'
g.	matar-a	'target'	mat r -at ec	'wooden target' (ec 'wood')
h.	mosad-ot	'institution'	mos d -ot xinux	'institutions of education'
i.	brax-a	'blessing'	birk-at ha-rav	'the rabbi's blessing'
j.	šan-a	'year'	š n-at alp-ayim	'the year 2000'
k.	banot	'daughters'	b n-ot ha-rav	'the rabbi's daughters'

Although there is some regularity to all the cases of stem allomorphy,⁸ the changes must be regarded as irregular because they are specific to the head nouns in question. For instance, whereas the word *yadayim* 'hands' has a construct allomorph *yed-ey* (21c), the phonologically identical *šadayim* 'breasts' takes the regular form *šad-ey* if it heads a construct noun; **šd-ey* or **šedey* are impossible.

No such irregularities are attested for either N or Adj in N+Adj. Both take on the same form as in isolation.

The fourth difference is the least clear cut. As is common with compounds, construct nouns often have meanings that are non-compositional with respect to the meaning of each noun in isolation:

(22) The interpretation of N+N is non compositional

	N_1		N_2		$N_{\text{head}}+N_{\text{mod}}$	
a.	báyit	'house'	séfer	'book'	beyt séfer	'school'
b.	pe	'mouth'	tabá-at	'ring'	pi tabá-at	'anus'
c.	em	'mother'	derex	'way'	em derex	'roadside'
d.	or	'skin'	tof	'drum'	or tof	'eardrum'

This seems to be considerably less common with N+Adj. Cases like *roš katan* '(lit. small head) purposely uninvolved person with no initiative' do exist; but these seem to be more like idioms, in that the metaphoric nature of the expression is more readily available.

The four differences surveyed are summarized in (23).

⁸ All the cases allomorphy in (21) can be explained by assuming a rule which deletes the vowel /a/ when it does not immediately precede the syllable carrying the main stress. There is a group of nominal and adjectival bases of the form CaCVC that obligatorily undergo this rule upon suffixation. However, as noted in the main text, this rule is not productive in constructs. It is true that the list in (21) is far from being exhaustive, nor can the items be regarded as lexicalized. For instance, *ofney harim* 'mountain bike' is the form that the word *ofan-ayim* takes regardless of the modifier: *ofney sport* 'sports bike', *ofney košer* 'fitness bike' etc. On the other hand, most stem-allomorphies in (21) are not obligatory: it seems that the more frequent the item, the more likely it is for it to show allomorphy.

There is a very small group of cases of allomorphy in the CS that cannot be attributed to /a/-reduction, such as *ʔav* 'father', but *ʔavi ha-kala* 'father of the bride'.

(23) Summary of comparison between N+N and N+Adj

Difference	$N_{head}-N_{modifier}$	N+Adj
a. Non-compositionality	common	much less so
b. Allomorphy	N_{head} , never N_{modif}	niether N nor Adj
c. Definite article	N_{head} or N_{modif}	N and Adj
d. Number of phonological words	one	two

In the next section, I will propose that these four differences have a structural explanation: the structural relation between N_{head} and $N_{modifier}$ is distinct from the one between N and Adj in a way that accounts for the differences above.

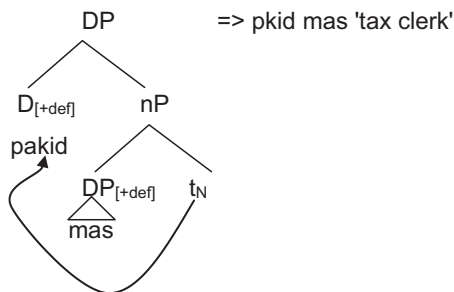
5. The structure of N+N and the structure of N+Adj

Many researchers have taken on the task of matching the construct phenomenon with syntactic structure, some also treating the N+Adj configuration. This section will open with a brief discussion of the literature, the goals it achieved and how it achieved them. I will then propose my own structures and illustrate how they account for the differences described in Section 4.

5.1. The syntax of the Construct State

The generative literature on the structure of the Semitic noun phrase is, as mentioned, ample. Generally speaking, researchers have been concerned with issues of word order and definiteness spreading or agreement.⁹ Shlonsky (2004) is somewhat of a survey of that literature, which could be complemented by Borer (2008) and Danon (2008). One consensus among researchers is that the modifying noun is situated above the head noun in the tree, usually in spec/NP. This raises the question of how the head noun ends up preceding the modifier. For this reason, it has been suggested as early as Ritter (1988) that the noun raises out of the NP into D (24). The modifier is placed under D, because it may carry the definite marker. The head noun inherits the definiteness value of the modifier in the process of raising to D (in order to value it), the latter adopts this value, and definiteness spreading results. A similar analysis is proposed in Borer (1999), though definiteness is not taken to be an indication of the presence of D in the structure: it is “base-generated” in the NP. Later studies adopted Borer’s proposal.

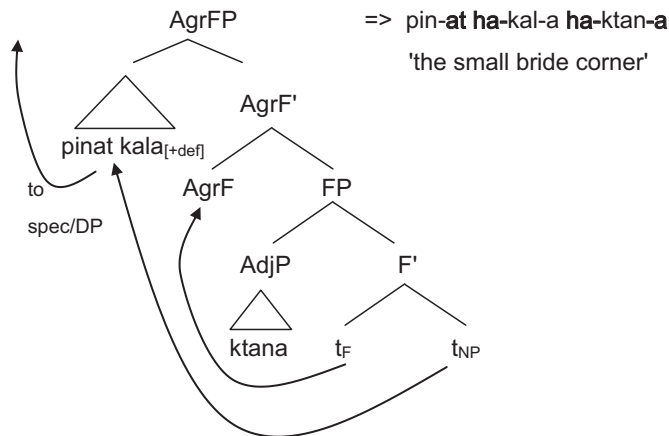
(24) N-to-D movement in the Semitic Construct State (Ritter 1986)



Another concern of these studies is with the linear order of adjectives. As with FS nouns, the adjective always follows the entire NP and agrees with it in definiteness: [*pinat (ha)-kala*]_{NP} [(*ha*)-*ktana*]_{AdjP} 'small bride corner'. The order has been explained by assuming that adjectives are right-adjoined to NP's in Semitic (see Kremers, 2003 for Arabic), and so are unaffected by movement. Shlonsky (2004), however, posits that AdjP is situated in the specifier position of “a functional projection”, call it F, above the head NP, which itself projects an agreement phrase AgrP (25). The NP, on its way to spec/DP, passes through spec/AgrP after F has raised to the head position of Agr. The raised NP enters into an agreement relation with the adjective. The agreement ends up being an instance of spec-head agreement. Notice that Shlonsky agrees with Borer (1999) in not assuming that [def] is a feature of D. In addition, for Shlonsky, it is not N, but rather the entire NP, which is raised. It is raised to spec/DP, rather than D.

⁹ Another topic which is regularly discussed in the literature is genitive case assignment, i.e. the means by which the N+N construction comes to denote a genitive relation. This discussion is not relevant for the present purposes. A summary of the discussion can be found in Siloni (2001).

(25) NP to Spec/DP movement, deriving adjectival agreement and order (Shlonsky 2004)



Possibly the most important recent paper in the field is [Borer \(2013\)](#), where it is convincingly shown that phonologically and syntactically similar N+N constructions differ in the degree of compositionality that they allow. Using several insightful tests, Borer distinguishes between non-compositional constructs such as *bet sefer* 'school' (lit. house-book), modificational constructs like *bet ec* 'wooden house' (lit. house-wood) and individual constructs like *bet ha-yalda* 'the girl's house'. She traces these differences to differences in syntactic structure and behavior: the modifying noun in individual constructs is a DP, whereas those of non-compositional and modificational constructs are NPs or CIP (more or less the equivalent, in Borer's theory, to "numberP"). The modifying noun of the non-compositional construct is incorporated into the head noun, whereas that of the modificational construct isn't.

None of the studies above discuss the special suffixal morphology of the construct noun. When these facts aren't straightforwardly ignored, they are written off as having no bearing on the syntactic structure. If anything, it is a recurrent claim in the literature – culminating in [Borer \(2013\)](#) – that neither morphological facts (e.g. appearance of *ha*, allomorphy) nor phonological facts such as the one explored here (realization of /t/) reflect anything in the syntactic structure. Indeed, the different syntactic structures that Borer proposes behave identically in these respects. In the following subsection, I explore the opposite hypothesis, namely that the affixal morphology of the CS does realize syntactically significant structures.

5.2. The structure of the construct state

As discussed in the previous subsection, the opinions on the structure of the CS vary, and none really focuses on CS affixal morphology. I will now propose my own, fairly simple structures of the N+N and N+Adj constructions. I will not aim to reconcile my own proposal with those surveyed above, nor will I attempt to derive the same effects. Instead, I will consider that inasmuch as the structures proposed here cover the facts summarized in (23) above, and in particular the affixal facts, the account has the right to be heard. I will nevertheless point out those junctures where the account conflicts or agrees with previous ideas on the issue.

The account here is based on the distribution of the definite article *ha*. Like the original proposal of [Ritter \(1988\)](#), but unlike most of the subsequent work mentioned, I assume that the definite article realizes the head D. The proposal will be confirmed by its ability to account for the other three differences.

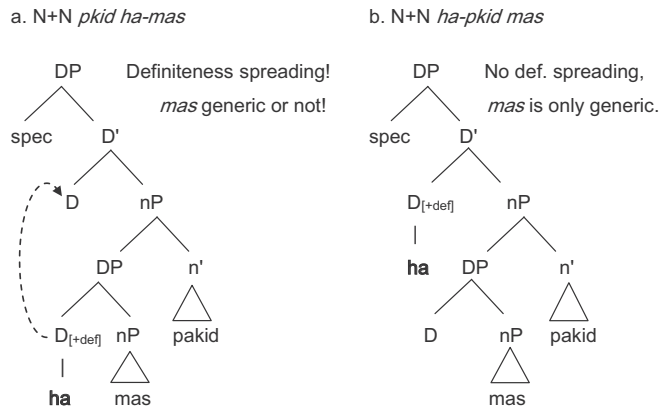
The proposed structure for $N_{\text{head}}-N_{\text{modifier}}$ is presented in (26). Assuming, again, that *ha* realizes D, and given that it has two possible positions, two DPs have to be involved, one for each noun. As is uncontroversial, N_{modifier} appears in spec/nP. Unlike the proposal in [Borer \(2013\)](#), in my analysis all modifying nPs are always embedded within a DP.

As demonstrated in (20) above, *ha* may appear on either of the two nouns. If it appears on N_{modifier} , then the interpretation of either noun is either generic or not; but if it appears on N_{head} , then the interpretation of N_{modifier} is strictly generic. In (26a), the D of the embedded N_{modifier} is realized. This entails the phenomenon of "definiteness spreading", typical of genitive constructions: in the present case, definiteness "percolates" to the embedding D.¹⁰ Because *ha*

¹⁰ The dotted line in (26) is only representational. I leave aside the issue of how this percolation is achieved – by feature-sharing ([Danon, 2008](#)), by semantic means ([Dobrovie-Sorin, 2003](#)) or as a result of movement ([Ritter, 1988](#)). The crucial point for the present analysis is that there is only one type of percolation, bottom-up percolation.

appears directly on N_{modifier} , its interpretation is generic or not. In contrast, in (26b), the embedded D is realized. No definiteness spreading can occur, since the embedded D is structurally lower than the embedding D. As a result, the interpretation of N_{modifier} is only generic.

(26) Morpho-syntactic structures to account for *ha-*: $N_{\text{head}}-N_{\text{modifier}}$

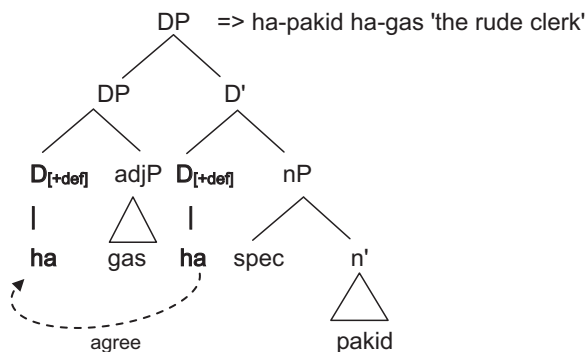


The structures in (26), based on the distribution of *ha*, are thus confirmed by their ability to account for the interpretations of N_{modifier} .

A word is due regarding word order. By standard assumptions, whereby the tree is read from left to right, the structures in (26) yield the wrong word order. Therefore, as explained in the previous subsection, researchers have adopted a raising analysis: N_{head} raises to some position above nP , and so ends up preceding N_{modifier} . As will become clear in what follows, insofar as the putative raised constituent remains within the complement of higher DP, the issue is tangential the present account. Thus, whether the correct order is derived by movement or by some other mechanism has no bearing on the analysis, and I will not discuss the issue of order any further. For the remainder of this paper, the proposed structures will reflect the situation before the (putative) movement.

The structure of $N+Adj$ is presented in (27). Since, as the reader recalls, adjectives obligatorily agree overtly with their noun in definiteness, I assume (1) that there are two DPs in the structure, one for the noun, another for the adjective, and (2) that the adjectival DP is in a position where it has to agree with the definiteness of the noun. This position cannot therefore be lower than D. In (27), the adjectival DP is represented as positioned in spec/DP. A structural relation of spec-head agreement (Koopman, 2006) holds between it and the head noun.¹¹

(27) $N+Adj$: Spec-head agreement in definiteness.



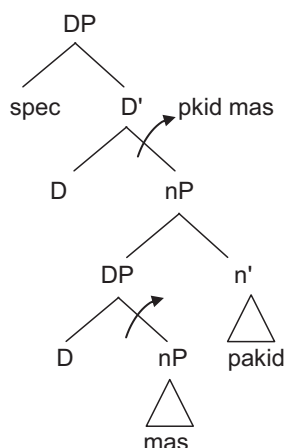
¹¹ The structure in (27) is, as far as I know, unlike any structure previously proposed for $N+Adj$: it does not assume right-adjunction of adjectives, nor does it place the adjective in a functional projection between the noun and its head D, as in Shlonsky, 2004 (see, however, Kremers, 2003 for a similar view, with the adjective in its own DP). Indeed, unlike previous accounts, and unlike the present account of the CS, this structure is problematic with respect to standard assumptions on the derivation of word order. Because the adjective is situated above the noun in the syntactic tree, it should also precede the noun, as in English. I do not have a principled explanation of why this is not so, but I suspect it may be related to the syntactic heaviness of the adjectival DP.

Having established and motivated the difference in structure, let us see how it explains the differences listed in (22). The first step is to identify boundaries in the structure. In the minimalist literature, such boundaries are called “phases” (Chomsky, 2001; Marantz, 2007). There is no general consensus in the literature on which syntactic heads demarcate phase structure. There is nevertheless agreement that such heads “spell out” – that is, match with phonological form – their structural complement. I will follow Adger (2007) in assuming that D is such a phasal head, and further adopt the proposal in Faust (2011), according to which D is the *first* phasal head.¹²

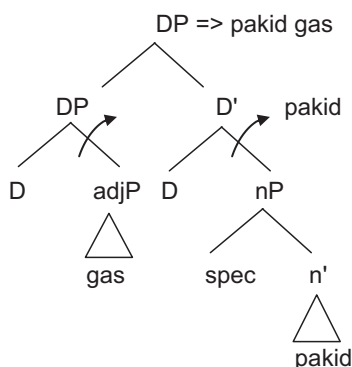
In (28), the two structures established above for $N_{\text{head}}+N_{\text{modifier}}$ and $N+\text{Adj}$, are presented side by side for comparison. If D is phasal, then the former has one phasal domain embedded in another (28a), whereas the latter involves two independent phasal domains (28b).

(28) Comparison of $N+N$ and $N+\text{Adj}$

a. $N+N$ *pkid mas* ‘tax clerk’



b. $N+\text{Adj}$ *pakid gas* ‘rude clerk’



The division in terms of phasal domains thus parallels the independently established division into prosodic words. Where there is one prosodic word, there is one major phasal domain, while two prosodic words match the structure with two independent phasal domains:

(29) Comparison of domains defined by the head D and the prosodic word

	$N_{\text{head}}+N_{\text{modifier}}$	$N+\text{Adj}$
a. Domains defined by D	$[\text{pakid} [\text{mas}]_{\text{D}}]_{\text{D}}$	$[\text{pakid}]_{\text{D}} [\text{gas}]_{\text{D}}$
b. Prosodic words	$\{\text{pakid mas}\}_{\text{ProsW}}$	$\{\text{pakid}\}_{\text{ProsW}} \{\text{gas}\}_{\text{ProsW}}$

If so, the structures in (28), independently established on the basis of the scope and distribution of *ha*, straightforwardly accounts for the number of main stresses and the division into prosodic words, too. This division into prosodic words, interestingly enough, is exactly the fact written off as unrelated to the relevant syntactic structures in Borer (2013), as mentioned above.¹³

¹² This claim, which is based on allomorphic behavior of stems in Modern Hebrew, is not uncontroversial within Distributed Morphology (Halle and Marantz, 1993), where most accounts are based on Marantz's (2007) view that all category-assigning heads (n, v, adj) are phasal. Problems with Marantz's view are identified in Embick (2010) and solved through various attenuations of, and systematic exceptions to the original idea of phasal effect. That D is the first phasal head is more compatible with the claim in Borer (2013, to appear), which designates functional structure as the boundaries of domains of content.

¹³ Another linguistic fact accounted for by the proposed structure is the positioning of some interjections with respect to the definite marker. These interjections, which may have several functions, constitute an exception to the rule stating that nothing can intervene between N_{modifier} and N_{head} . Consider for example [faking] (from English *fucking*), which serves an intensifying function. In a construct noun like *roš ha-memšala* ‘prime-minister (litt. head the-government)’, the interjection may follow *ha* (*roš ha-faking memšala* ‘the prime minister himself!’) or precede the entire construct. But it may not precede the internal *ha*: **roš faking ha-memšala*. This separation of *ha* from its alleged host N_{modifier} is explained in (28a) through the fact that the two are in different phases. In contrast, N_{head} and *ha* are in the same phase, and cannot be separated.

What about the two other differences listed above, viz. allomorphy and compositionality? Within the minimalist morphological theory of Distributed Morphology (Halle and Marantz, 1993), phase heads define not only the prosodic word, but also the domain of the encyclopedic entry. As a consequence, both interpretation and form are established as a result of the merger of these heads. In terms of the influence of one item on the other, there are therefore three possible patterns. In (30a), since the two items are in different phases, neither can influence the other. In (30b), possible influence is mutual. In (30c), Y cannot be sensitive to either the form or the meaning of X, because Y is spelled out before X, but the opposite *is* true: X can be influenced by both the form and the meaning of Y, which are already around by the time Y is accessed (see Kaye, 1995 for a discussion from a different perspective).

(30) Sensitivities

- | | | |
|-----------------------------------|-----------------------|---|
| a. Mutually insensitive | b. Mutually sensitive | c. X sensitive to Y
Y insensitive to X |
| [X] _D [Y] _D | [X Y] _D | [X [Y] _D] _D |

(30a) reflects the structure proposed for N+Adj. It thus follows that neither the meaning nor the form of either the noun or the adjective may be idiosyncratic as a result of their placement in this structure. In other words, no non-compositionality or allomorphy is expected to appear. As shown above, none does. The structure of N_{head}+N_{modifier} in (28a) above yields the situation in (30c). The embedded N_{modifier} is insensitive to N_{head}, but the opposite is not true, and thus, N_{modifier} may not exhibit allomorphy as a result of its embedding; but N_{head} may very well do so. Finally, like the form of N_{head}, its interpretation may also be idiosyncratic. This state-of-affairs, as we saw, is confirmed by the evidence.¹⁴

To summarize this section, the four differences between the two configurations N_{head}+N_{modifier} and N+Adj, which were identified in Section 4, were all covered by the structures proposed, with their division into phases. We are now ready to return to the feminine suffix with its floating /t/, and explain why it anchors in one configuration but remains afloat in the other.

6. Back to the /t/ of the feminine /at/

In Section 3, I proposed that anchoring of /t/ to the initial CV of the following word was a possible source for the retention of /t/ in the Construct State. It was then necessary to examine why this does not happen in N+Adj. The previous section argued for a difference in the phasal composition of the two constructions: construct nouns are [N [N]], whereas N+Adj have the structure [N][Adj]. I will now show how this difference leads to the anchoring pattern of the feminine /t/.

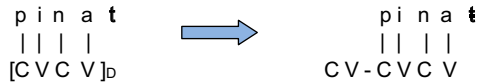
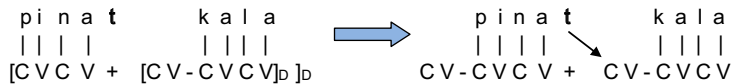
Scheer (2009, 2012) discusses modularity, asking (among other questions) how syntactic structure can be translated into phonological entities, or how phonology can detect the phase-boundaries transmitted from syntax. As already mentioned in Section 4.1, he dismisses labels such as Selkirk (1981) “PrWd” or SPE’s “#” as diacritics, i.e. entities that a constrained phonological module cannot understand. Boundaries, it is argued, must be transmitted to the phonological module in terms that the phonology can manipulate. Scheer proposes to regard Lowenstamm’s (1999) initial CV not as word-initial, but rather as phase-initial. According to this view, a CV unit is the phonological realization of (at least some of the) left phasal brackets, and thus replaces these brackets at spell-out.

Now let us return to the feminine /t/. The representation of a FS feminine noun is recalled in (31a). As proposed in (13) above, the /t/ does not have skeletal support. The left phasal bracket is realized as an initial CV, but this is irrelevant for the floating /t/ at the right edge. Since no support is provided within its phase, the /t/ is erased. (31b) represents the derivation of a construct noun, as it would proceed given the phase structure argued for above and Scheer’s proposal. Again, the left brackets of both phases are replaced by CV units. An empty CV unit becomes available between the two nouns, namely the one which realizes the left bracket of the internal phase, hosting N_{modifier}. Since the floating /t/ is within the same phase as that CV, its linking to it becomes possible, and indeed obligatory.

¹⁴ One problem, however, is that the interpretation of N_{modifier}, which is located in its own phase, is predicted to be unaffected by its position within the higher DP. This is a bad prediction, as demonstrated by constructs such as *or tof’eardrum* (lit. skin-drum) in (22): the modifier noun *tof’drum* clearly has an idiosyncratic interpretation in this case. I do not know how to explain this fact. An in-depth discussion on the domain of interpretation can be found in Borer (2013).

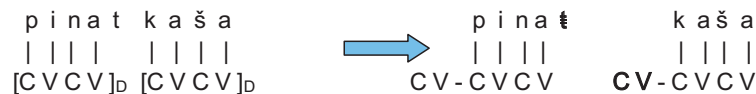
(31) Skeletal and phasal make-up of N vs. $N_{\text{head}}+N_{\text{modifier}}$

a. N pina 'corner'

b. $N_{\text{head}}+N_{\text{modifier}}$: pinat kala 'bride corner'

Compare this to the situation in (32), which represents the derivation of the configuration N+Adj under the view combining the present analysis and Scheer's. The two items belong to different phases, and thus cannot be sensitive one to the form of the other. At no stage in the derivation are the /t/ and the initial CV of the following phase at the same phase. When N is spelled out, its floating /t/ cannot be associated to the initial CV of the right-adjacent phase, because the /t/ itself is at a phase edge. This /t/ is thus lost forever, exactly like it is in the FS, as represented by the double strikethrough.

(32) N+Adj: pin-a kaš-a 'tough corner'



With the minor exception of the embedding in (31b), the structures in (31) and (32) have already been presented in (19) above. But in (19), use was made of prosodic boundaries as phonological entities. In the present section, such use was deemed problematic for phonological processes. In the revised analysis in (31) and (32), which is based on independently motivated structures, the prosodic boundaries are shown to follow from these syntactic structures, and no use is made of non-phonological objects to explain the phonological distribution of the floating /t/. We may now return to the second question asked at the beginning of this paper:

Q2. Why is the access to a following initial CV blocked in N+Adj?

The answer is that the feminine suffix is never in the same phase as the following adjective, and therefore may not interact phonologically with it. The phenomenon thus constitutes a phonological equivalent to the *Phase Impenetrability Condition* (Chomsky, 2001), by which the material in one phase is not accessible to further operations.¹⁵

To conclude, the combination of the structures proposed in the previous section and Scheer's proposal was able to explain the distribution of /t/: for it to be linked to a skeletal position, a certain adjacency is required which exists only in $N_{\text{head}}-N_{\text{modifier}}$ configurations. Provided the analysis is correct, it argues for the validity of both Scheer's and the present claims.

7. Summary

This paper treated the problem of the floating /t/ of the Modern Hebrew feminine marker /at/. This /t/, whose underlying presence cannot be doubted, presents a problem because its surfacing patterns are only partially explicable on phonological grounds. More specifically, in a certain configuration called the "Construct State", it surfaces with seemingly no phonological motivation. To complicate matters, in the seemingly identical N+Adj configuration it does not appear.

I proceeded to show that this appearance in fact does have phonological motivation, albeit one which can be detected only if one takes into account exclusively skeletal material. I adopted Lowenstamm's (1999) proposal that in some languages, (some) words begin with an empty CV-unit and showed that according to his criterion, Modern Hebrew should have such an initial CV. The docking /t/, I claimed, utilizes the initial CV of the following noun.

¹⁵ The exception in Chomsky (2001) is the head of that phase and its specifier position. This does not concern us here.

In order to explain why it does not have access to the initial CV of a following adjective, the option of the initial CV marking prosodic boundaries was brought up. This option did account for the facts, but itself required independent motivation. A general comparison between the N+N and N+Adj configurations was conducted. I proposed two morpho-syntactic structures that were confirmed by their ability to account for the differences found. The derivational chunking of these structures according to phase theory rendered the postulation of prosodic brackets redundant. The account was able to explain the distribution of /t/ in both the construct state and N+Adj as an essentially phonological phenomenon, influenced by phase structure. More specifically, it was shown that in the N+Adj configuration, the following initial CV is not available for /t/ to dock onto. The analysis is compatible with Scheer's interpretation of the initial CV being the realization of the phase boundary, rather than word-initial.

The present account further establishes the status of D as a phasal head. In his discussion of phonological phasal effects, [Scheer \(2009\)](#) does not find a phonological reflex for the DP level: If I am correct, the appearance of /t/ in the CS is such a reflex.

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References

- Adger, D., 2007. Stress and phasal syntax. *Linguist. Anal.* 38, 238–266.
- Bat-El, O., 1989. *Phonology and Word Structure in Modern Hebrew* (PhD dissertation). UCLA.
- Bat-El, O., 1997. On the visibility of word internal morphological features. *Linguistics* 35, 289–316.
- Bendjaballah, S., Martin, H., 2008. A typology of emptiness in templates. In: Hartmann, J., Hegedus, V., van Riemsdijk, H.C. (Eds.), *Sounds of Silence: Empty Elements in Syntax and Phonology*. Elsevier, Amsterdam, pp. 21–57.
- Borer, H., 1999. Deconstructing the construct. In: Johnson, K., Roberts, I. (Eds.), *Beyond Principles and Parameters: Essays in Memory of Osvaldo Jaeggli*. Kluwer Academic Publishers, Dordrecht, pp. 43–89.
- Borer, H., 2008. Compounds: the view from Hebrew. In: Lieber, R., Stekauer, P. (Eds.), *The Oxford Handbook of Compounds*. Oxford University Press, Oxford.
- Borer, H., 2013. The syntactic domain of content. In: Becker, M., Grinstead, J., Rothmann, J., Schwartz, B.D. (Eds.), *Generative Linguistics and Acquisition: Studies in Honor of Nina M. Hyams*. John Benjamins, Philadelphia, pp. 205–248.
- Borer, H., 2014. The category of roots. In: Alexiadou, A., Borer, H., Schäfer, F. (Eds.), *The Syntax of Roots and the Roots of Syntax*. Oxford University Publishing (to appear).
- Chomsky, N., 2001. Derivation by phase. In: Kenstowicz, M. (Ed.), *Ken Hale: A Life in Language*. MIT Press, Cambridge, pp. 1–52.
- Clements, G.N., Keyser, S.J., 1983. *CV Phonology: A Generative Theory of the Syllable*. MIT Press, Cambridge, MA.
- Danon, G., 2008. Definiteness spreading in the Hebrew construct state. *Lingua* 118 (7), 872–906.
- Dobrovie-Sorin, C., 2003. From DPs to NPs: a bare phrase structure account of genitives. In: Coene, M., D'hulst, Y. (Eds.), *From NP to DP, Vol. 2: The Expression of Possession in Noun Phrases*. John Benjamins, Amsterdam. (*Linguistik aktuell/Linguistics Today* 56), pp. 75–120.
- Embick, D., 2010. *Localism Versus Globalism in Morphology and Phonology*. MIT Press, Cambridge, Massachusetts.
- Encrevé, P., 1988. *La liaison avec et sans enchaînement: phonologie tridimensionnelle et usages du français*. Paris, Seuil.
- Faust, N., 2011. *La Morphologie Nominale de L'hébreu Moderne: Etudes en Morpho-Syntaxe* (PhD dissertation). Université Paris VII.
- Halle, M., Marantz, A., 1993. Distributed morphology and the pieces of inflection. In: Hale, K., Keyser, S.J. (Eds.), *The View from Building, vol. 20*. MIT Press, Cambridge, pp. 111–176.
- Izre'el, S., Benjamin, H., Giora, R., 2001. Designing CoSIH: the corpus of spoken Israeli Hebrew. *Int. J. Corpus Linguist.* 6, 171–197.
- Kaye, J., 1995. Derivations and interfaces. In: Durand, J., Francis, K. (Eds.), *Frontiers of Phonology*. Longman, London & New York, pp. 289–332.
- Kaye, J., Lowenstamm, J., Vergnaud, J.R., 1990. Constituent structure and government in phonology. *Phonol. Yearb.* 7, 193–231.
- Koopman, H., 2006. Agreement: in defense of the “Spec head configuration”. In: Boeckx, C. (Ed.), *Agreement Systems*. John Benjamins, Amsterdam.
- Kremers, J., 2003. Adjectival agreement in the Arabic noun phrase. In: van Koopen, M., Sio, J., de Vos, M. (Eds.), *Proceedings of ConSOLE XI*.
- Lowenstamm, J., 1996. CV as the only syllable type. In: Durand, J., Bernard, L. (Eds.), *Current Trends in Phonology. Models and Methods*. ESRI, Salford, Manchester, pp. 419–441.
- Lowenstamm, J., 1999. The beginning of a word. *Phonologica* 153–166 (The Hague: Holland Academic Press).
- Marantz, A., 2007. Phases and words. In: Sook-hee, C. (Ed.), *Phases in the Theory of Grammar*. Dong-in, Seoul, pp. 196–226.
- McCarthy, J.J., 1981. A prosodic theory of nonconcatenative morphology. *Linguist. Inq.* 12, 373–418.
- Ritter, E., 1988. A head-movement approach to Construct State noun phrases. *Linguistics* 26 (6), 909–929.
- Scheer, T., 2004. *A Lateral Theory of Phonology. Vol. 1: What is CVCV and Why Should it be?* Mouton de Gruyter, Berlin.
- Scheer, T., 2009. External sandhi: what the initial CV is initial of. *Studi Saggi Linguist.* 47, 43–82.
- Scheer, T., 2012. *Direct Interface and Once-channel Translation*. Mouton de Gruyter, Berlin.
- Selkirk, E., 1981 [1978]. On prosodic structure and its relation to syntactic structure. In: Fretthimm, T. (Ed.), *Nordic Prosody II. TAPIR*, Trondheim, pp. 111–140.
- Shlonsky, U., 2004. The form of Semitic nominals. *Lingua* 114.12, 1465–1526.
- Siloni, T., 2001. Construct states at the PF interface. *Linguist. Var. Yearb.* 1, 229–266.