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*The emergence of the trochaic foot in Hebrew hypocoristics**

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The paper provides an optimality-theoretic analysis of the prosodic structure and stress patterns in templatic and non-templatic hypocoristics in Hebrew. It is designed to illustrate the emergence of the trochaic foot, whose role elsewhere in the language is rather limited. The trochaic foot has been shown to determine the structure of templatic hypocoristics in various languages; this is also true in Hebrew. In addition, it plays a major role in Hebrew non-templatic hypocoristics, which on the surface look like simple constructions of base + suffix. The trochaic foot does not delimit the number of syllables in non-templatic hypocoristics, but it plays an important role in the stress system, where the position of stress is also sensitive to the input stress and the type of suffix.

1 Introduction

Hebrew is a quantity-insensitive language, as its stress system does not distinguish between CV and CVC syllables (there are no phonemic long vowels in the language). Following Hayes (1995), the stress system of quantity-insensitive languages is expected to consist of syllabic trochaic feet, on the assumption that feet are universally binary (Prince 1980 and later studies). However, the stress patterns found in the language are mixed, and in many cases do not meet this expectation. Quite a few nouns bear penultimate stress, and can be assigned a trochaic foot (e.g. [dégel] 'flag', [tíras] 'corn'). However, many nouns and adjectives (mostly native) and all verb stems bear final stress (e.g. [cajár] 'painter', [ʃamén] 'fat', [sipér] 'to tell'). There are two possible foot structures for the forms with final stress: either a strong degenerate trochaic foot ([si(pér)]) or a binary iambic foot ([(sipér)]). Under either analysis, the expected binary trochaic foot is not an option.

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Such uncertainty does not arise with respect to the stress system of Hebrew hypocoristics, where the prominent foot is, as expected, a binary trochee. Hebrew has two types of hypocoristic, templatic (TH) and non-templatic (non-TH), which are both accompanied by a suffix, *-i* in TH and non-TH, and *-le* in non-TH.[1] THs have both a minimal and maximal limit of two syllables, and thus undergo truncation. Non-THs preserve the structure of the full name, and thus do not involve truncation.

(1) *Types of Hebrew hypocoristics*

a. *Templatic hypocoristics*

-i	*base name*	*hypocoristic*
	sigál	síg-i
	cipóra	cíp-i
	ʃoʃána	ʃóʃ-i
	menáxem	mén-i

b. *Non-templatic hypocoristics*

-i	*base name*	*hypocoristic*	*-le*	*base name*	*hypocoristic*
	mixál	mixál-i		tíkva	tíkva-le
	ʔerán	ʔerán-i		míka	míka-le
	davíd	davíd-i		xána	xána-le
	revitál	revitál-i		cipóra	cipóra-le

As for the stress pattern, THs bear penultimate stress and non-THs preserve the stress on the same syllable as in their corresponding bases. However, base names often exhibit variable stress (e.g. [xána] ~ [xaná], [dávid] ~ [davíd], where ~ indicates free variation), but there are no two non-THs with the same suffix and different stressed syllable (e.g. [xána-le] ~ *[xaná-le], [davíd-i] ~ *[dávid-i]). This is due to the fixed stress pattern associated with the suffixes: hypocoristics with *-i* bear penultimate stress and hypocoristics with *-le* bear antepenultimate stress.

Non-THs must then meet two conditions: (i) the stress pattern associated with the suffixes must be surface-true, and (ii) the stressed syllable in the base name must be stressed in the hypocoristic as well. These conditions do not allow attaching *-le* to [ʔerán] (*[ʔerán-le]) or *-i* to [menáxem] (*[menáxem-i]), but they do allow [david], which has variable stress, to be the base of both *-i* ([davíd-i]) and *-le* ([dávid-le]).

[1] The suffix *-le*, also found in [ʔába-le] 'daddy' ([ʔába] 'father') and [ʔíma-le] 'mummy' ([ʔíma] 'mother'), has been borrowed from Yiddish (Zuckermann 2000), and is used mostly, but not exclusively, by the older generation. The suffix *-i* has been borrowed from German (Zuckermann 2005), and is much more common. Hypocoristics with either suffix may be used as a term of endearment (i.e. context-dependent) as well as the non-formal variant of a name (i.e. register-dependent). However, non-THs are more common as a term of endearment, while THs are more common as the non-formal variant of a name. I ignore here marginal patterns of hypocoristics, in particular those borrowed as a whole from Yiddish (e.g. [jícxak] – [ʔícik], [jákov] – [jánka-le]), as well as those with the marginal suffixes *-uʃ* ([mík-uʃ]) and *-ki* ([roʔí-ki]).

It will be argued that the hypocoristic suffixes are subcategorised for metrical structure, defined by the binary trochaic foot (condition (i)), and at the same time the hypocoristic has to be faithful to the base name with respect to the stressed syllable (condition (ii)).

The analysis provided in this paper recognises the central role of the binary trochaic foot in determining the prosodic structure and stress pattern of THs, as well as the stress pattern of non-THs. This is in contrast with the minor role of the binary trochaic foot in the stress system of Hebrew, but in accordance with Hayes' (1995) generalisation that quantity-insensitive languages employ trochaic syllabic feet.

The prominence of the binary trochaic foot in Hebrew hypocoristics thus reflects 'the emergence of the unmarked' (McCarthy & Prince 1994). This notion refers to cases where the effect of a suppressed markedness constraint emerges in a class of forms associated with a different constraint ranking. In the case discussed here, the constraint TROCHEE, whose effect is usually suppressed due to its low ranking, emerges in hypocoristics, whose constraint ranking grants TROCHEE an undominated status.

The discussion begins with a review of the stress patterns in Hebrew nouns (§2.1), arguing that the effect of TROCHEE is limited to one particular class of noun stems with penultimate stress. Otherwise, the various stress patterns of the language emerge from the interaction of several constraints, none of which is TROCHEE. The stress pattern of proper names is then presented (§2.2), as a background to the discussion on non-THs, which preserve the stress on the same syllable as in the base. The analysis of Hebrew hypocoristics begins with THs (§3), whose structure is assigned by the binary trochaic foot. It is shown that the constraint hierarchy deriving the stress pattern of the limited class of noun stems with penultimate stress is the one deriving the stress pattern in THs. In non-THs (§4), the binary trochaic foot serves as the subcategorisation frame of the suffixes. A non-TH is entirely faithful to its base name, as it exhibits neither truncation nor stress shift. Thus, in case the position of stress in the base does not conform to the subcategorisation, the optimal candidate is the null parse.

The data presented in this paper are based on existing hypocoristics (rather than on forms drawn from experiments assessing speakers' intuitions). Native speakers were asked to provide the names and the corresponding nicknames of people they knew or knew of. Nicknames whose segmental structure was remote from the base name (e.g. [kúʃkuʃ] for [mixál]), were excluded, although most of them fit into the binary trochaic foot. Sporadic segmental alternations appearing in THs, such as stopping (e.g. [rú**v**en] ~ [rú**b**i]) and vowel alternation (e.g. [b**i**njámin] ~ [b**é**ni]), are ignored.

2 Stress in Hebrew nouns and proper names

This section provides a brief discussion of the stress patterns in Hebrew noun, arguing that the effect of TROCHEE is exclusively limited to one type of nouns. Otherwise, foot prominence, either trochaic or iambic, emerges from (i) an underlying distinction between stems with lexical stress and stems free of stress, and (ii) constraint interaction, where TROCHEE is not active. The first subsection (§2.1) discusses stress in stems and suffixed forms (mostly nouns) and the second (§2.2) stress in proper names.

2.1 Stress in stems and suffixed forms

Hebrew is a quantity-insensitive language; it has no phonemic length contrast and its stress system, as reviewed below, does not distinguish between CV and CVC syllables.[2] According to Hayes' study of stress systems, 'the syllabic trochee is the basic mechanism available for quantity-insensitive alternation' (1995: 73). With the general assumption that the unmarked foot is binary, this tendency gave rise to two competing analyses of the Hebrew stress system. Graf & Ussishkin (2003), giving priority to foot binarity, argue that the strong foot (enclosed in parentheses) is binary, either trochaic or iambic ([(kélev)], [(cajár)]). Alternatively, Becker (2003a), giving priority to trochee, argues that the strong foot is trochaic, either binary or degenerate ([(kélev)], [ca(jár)]).

Graf & Ussishkin (2003) isolate the constraints requiring binary feet from those responsible for foot prominence. The proposal is based primarily on the Hebrew verb paradigm, but is claimed to hold for Hebrew nouns as well, taking into consideration some idiosyncrasies to be discussed below. According to this proposal, final stress in Hebrew is due to the interaction of the constraints requiring right-aligned binary feet not specified for prominence (ALIGN-R(Ft, PrWd) and FOOTBINARITY (FTBIN)), with the constraint requiring stress to reside on the final syllable in the prosodic word (FINALSTRESS). That is, the iambic foot in [(cajár)] 'painter' is not due to the constraint IAMB, and the trochaic foot in [(tíras)] 'corn' is not due to the constraint TROCHEE. As I will show below, while in both the feet are assigned by ALIGN-R(Ft, PrWd) and FTBIN, in the former the prominence of the foot is determined by FINALSTRESS, and in the latter it is lexical.

Graf & Ussishkin's analysis is challenged by Becker (2003a), who argues that feet in Hebrew are trochaic. Becker's analysis is based on acoustic studies of phrases, which showed that stress has two phonetic manifestations in Hebrew: vowel length in the stressed syllable and high pitch on the following syllable (which can be the first syllable in the following word). In isolation, or in phrase-final position, words with penultimate stress have the same structure as in Graf & Ussishkin's analysis, i.e.

[2] Also, the templatic morphology of the language does not distinguish between the different types of syllable. For example, the prosodic structure of the verbs [gidel] 'to grow', [tirgem] 'to translate' and [kimpleks] 'to make complex' is assigned by a disyllabic template, not specified for subsyllabic structure (McCarthy 1984, Bat-El 1994b, Ussishkin 2000).

[(tíras)]. However, in the same context words with final stress have a degenerate foot, i.e. [ca(jár)], rather than a binary foot.[3]

Most noun stems in Hebrew bear final stress, quite a few bear penultimate stress and there is also a handful with antepenultimate stress. As shown in Table I below, syllable structure, i.e. CV *vs.* CVC, does not play a role in the stress pattern, as expected in a quantity-insensitive language (Bolozky 1982, Graf 1999); both CV and CVC can be stressed on any of the last three syllables of the prosodic word. Only nouns are given here; verbs stems always bear final stress, whether the final syllable is CV (e.g. [kaná] 'he bought') or CVC (e.g. [gadál] 'he grew').

	ultimate		penultimate		antepenultimate	
CV	mispó	'fodder'	kélev	'dog'	télefon	'phone'
	kitá	'class'	tíras	'corn'	ʃókolad	'chocolate'
	xatuná	'wedding'	rakévet	'train'	brókoli	'broccoli'
CVC	ʃulxán	'table'	tráktor	'tractor'	ʔámbulans	'ambulance'
	kadúr	'ball'	sávta	'grandma'	ʔámburger	'hamburger'
	ʔavirón	'plane'	mástik	'gum'	béjgale	'pretzels'

Table I

Hebrew stress is not sensitive to syllable structure. Examples of CV and CVC stressed syllables.

The stress system in the verb paradigm is regular and consistent. All verb stems bear final stress. The stressed pattern in suffixed verbs depends mostly on the type of suffix (vowel-initial *vs.* consonant-initial), the number of syllables in the stem (one *vs.* two) and the height of the vowel in the last syllable of the stem (high *vs.* non-high). Stress in suffixed verbs is penultimate when the stem is monosyllabic (e.g. [ʃár] 'he sang' – [ʃár-a] 'she sang' – [ʃár-ti] 'I sang'), when the vowel in the final stem syllable is high (e.g. [hitxíl] 'he started' – [hitxíl-a] 'she started') and when the suffix is consonant-initial (e.g. [patáx] 'he opened' – [patáx-ti] 'I opened').[4] When the suffix is vowel-initial (and the stem is not monosyllabic and

[3] Becker, unlike Graf & Ussishkin, does not assume exhaustive footing, arguing that there are no acoustic cues for secondary stress. This does not bear on the discussion here.

[4] These generalisations hold for the past and future forms of verbs. The stress pattern in participles, which are traditionally presented in the verb paradigm, follows that of native nouns and adjectives (as argued in Bat-El 2005, the morphophonolgy of participles is identical to that of adjectives). Thus, the past form with penultimate stress, [hitxíl-a] 'she started', contrasts with the participle form with final stress, [ma-txil-á] 'she starts'. This is also true for the monosyllabic stems, but only in the normative register. That is, the contrast between the past form [ʃár-a] 'she sang' and the participle form [ʃar-á] 'she sings' has been eliminated in the colloquial register, where [ʃár-a] is used for both forms. However, monosyllabic noun stems, like [sar-á] 'female minister', do exhibit final stress.

does not have a high vowel in the final syllable) stress is final (e.g. [patáx] 'he opened' – [patx-á] 'she opened', [tirgém] 'he translated' – [tirgem-á] 'she translated').

What is unique to the stress patterns in nouns, as opposed to verbs, are the mixed paradigms, not predicted by phonological (or morphological) properties. Nouns with an identical stress pattern in the stem may have different stress patterns when the plural suffix is added (e.g. [gamád] 'dwarf' – [gamad-ím] 'dwarves' *vs.* [salát] 'salad' – [salát-im] 'salads'), and nouns with an identical stress pattern in their plural suffixed forms may have different stress patterns in the stems (e.g. [gamál] 'camel' – [gmal-ím] 'camels' *vs.* [kéter] 'crown' – [ktar-ím] 'crowns').

As argued in Bat-El (1993), the classification of nouns with respect to stress must be based on their behaviour in the paradigm, rather than on the stress in the stem (see also Mel'čuk & Podolsky 1996, Graf 1999, Bolozky 2000). In some nouns, stress is immobile, appearing on the same syllable in the bare stem and the suffixed form (2b). In others, stress is mobile, final in the suffixed form and final (2a.i) or penultimate (2a.ii) in the bare stem. As the data in (2) clearly show, stress mobility is not determined by phonological properties, such as syllable structure or the position of stress in the stem.[5]

(2) *Stress mobility*

a. *Mobile stress*

i. *Final in bare stems*

xút	xut-ím	'string'
tavlín	tavlin-ím	'spices'
melafefón	melafefon-ím	'cucumber'

ii. *Penultimate in bare stems*

nékev	nekav-ím	'hole'
xéder	xadar-ím	'room'
ʃóreʃ	ʃoraʃ-ím	'roots'

b. *Immobile stress*

i. *Final in bare stems*

tút	tút-im	'strawberry'
xamsín	xamsín-im	'heatwave'
hipopotám	hipopotám-im	'hippopotamus'

ii. *Penultimate in bare stems*

méter	métr-im	'metre'
tíras	tíras-im	'corn'
tráktor	tráktor-im	'tractor'

5 When stress is antepenultimate in the stem, it optionally shifts two syllables to the right when a suffix is added (e.g. [télefon] – [télefon-im] ~ [telefón-im], [ʔámbulans] – [ʔámbulans-im] ~ [ʔambuláns-im]). The discussion here is restricted to stems with final and penultimate stress, and to forms with the masculine plural suffix *-im*. See Bat-El (1993) and Graf (1999) for extensive discussion.

Of the four types above, those with mobile stress are the most common, as they characterise native vocabulary. Immobile stress is found mostly, but not exclusively, in borrowed nouns (Schwarzwald 1998) and acronym words (Bat-El 1994a).[6]

As the examples in (2) suggest, Hebrew learners are faced with inconsistent evidence when it comes to establishing the stress system of nouns. Since phonological generalisations cannot be obtained, they have to learn the stress pattern of each noun stem independently, i.e. the position of stress in the bare stem, and whether it is mobile or immobile. This learning procedure is supported by the fact reported in Ben-David (2001) that children hardly ever misplace stress in stems, although their vocabulary includes all stress patterns (e.g. [bubá] 'doll', [dúbi] 'teddy bear', [télefon] 'phone'). Had the children reached some generalisation at a certain point in the acquisition of stems, we would expect to see incorrect stress patterns in some stems, conforming to the generalisation.

Berman (1981) and Levy (1983) report that when suffixed forms start appearing in the children's speech, immobile stress is prevalent. However, later on, when sufficient data are encountered, suffixed forms take final stress, with a certain degree of overgeneralisation. This overgeneralisation is statistically motivated, since, as noted above, most nouns take mobile stress, which means that their suffixed forms bear final stress.

Adults, however, show a certain degree of preference for immobile stress (and thus penultimate stress). A noun with mobile stress may gain a semantically related counterpart with immobile stress, as in [cafón] 'north' – [cfon-í] 'northern' – [cfón-i] 'a person from the north of Tel-Aviv (upper class)' and [kláf] 'card' – [klaf-ím] 'cards' – [kláf-im] 'card games' (Schwarzwald 1998); some vowel-final native nouns with final stress, such as [glidá] 'ice-cream' – [glid-ót] 'ice-creams' have an alternative non-normative immobile stress pattern, as in [glída] – [glíd-ot]; pluralisation of names exhibits immobile stress, as in the name [jóram] – [jóram-im] (Berent *et al.* 2002); and most acronym words exhibit immobile stress, as in [pakám] 'short term deposit' – [pakám-im] 'short term deposits' (Bat-El 1994a).[7]

The first subsection below discusses immobile stress (2b), which is argued to be lexical, and mobile stress associated with stems with final stress (2a.i). The second subsection is devoted to mobile stress associated with stems with penultimate stress (2a.ii). The stress system of the latter stems is similar to that of THs.

2.1.1 *Lexical immobile stress and final mobile stress.* Following Bat-El (1993) and Graf (1999), stems with immobile stress are lexically specified

[6] Schwarzwald (1990) points out that some non-paradigmatic words have variable stress (e.g. [káma] ~ [kamá] 'how many', [meʔídax] ~ [meʔidáx] 'on the other hand', [támid] ~ [namíd] 'always'). As shown in §2.2 below, this is also true for names.

[7] The acronym [pakám] 'short term deposit' stands for [pikadon kcar moed] 'deposit short term'.

for stress (by marking the prominent syllable) while those with final mobile stress do not have a lexical specification. I assume Graf & Ussishkin's (2003) analysis, according to which a binary foot not specified for prominence is assigned at the right edge of the prosodic word (it is not relevant here whether footing is exhaustive).

In forms with lexical stress, the prominence of the foot is determined by the position of the lexically specified stress. Given that feet are right-aligned due to ALIGN-R(Ft, PrWd), an iambic foot emerges when the lexical stress is final (e.g. [(ga.lón)] 'gallon'), and a trochaic foot emerges when it is penultimate (e.g. [ga.(ló.n-im)] 'gallons'). When the lexical stress is antepenultimate, the emergent foot is also trochaic. However, since the head of the foot has to be the lexically specified syllable, the foot cannot align with the right edge of the prosodic word (e.g. [(trák.to)r-im] 'tractors').

In forms with no lexical stress, FINALSTRESS assigns stress to the final syllable in the prosodic word, and the emergent foot is thus iambic (e.g. [(ga.mád)] – [ga(ma.d-ím)].

The constraint ranking below accounts for nouns with lexical immobile stress, as well as nouns with final mobile stress.

(3) *Constraint ranking for lexical immobile stress and final mobile stress*
FTBIN, IDENTSTRESS ≫ ALIGN-R(Ft, PrWd), FINALSTRESS ≫ TROCHEE

a. FTBIN[8]
Feet are binary.

b. IDENTSTRESS
The output syllable corresponding to the input stressed syllable is stressed.

c. ALIGN-R(Ft, PrWd)
The right edge of the foot aligns with the right edge of the prosodic word.

d. FINALSTRESS
The final syllable in the prosodic word is stressed.

e. TROCHEE
The leftmost unit in the foot is prominent.

FTBIN requires a binary foot, and ALIGN-R(Ft, PrWd) makes sure that the foot is at the right edge of the prosodic word. IDENTSTRESS, presented in Graf (1999) as HEADMATCH, is active only in the presence of lexical

[8] Binarity of feet can also be defined in terms of syllables or moras. However, since Hebrew phonology does not provide evidence for the mora, the relevant constituent here is the syllable. Notice that FTBIN does not impose augmentation on underlying monosyllabic stems such as [ken] 'nest' and [ger] 'proselyte', due to DEP ≫ FTBIN in input–output relations. In output–output relations, as in denominative verbs (Bat-El 1994, Ussishkin 2000), FTBIN is dominant and the derived verb is thus minimally and maximally disyllabic (e.g. [ken] 'nest' – [kinen] 'to nest', [ger] 'proselyte' – [giyer] 'to proselytise').

stress, as it refers to corresponding stressed syllables in the input (lexical stress) and the output. It competes with ALIGN-R(Ft, PrWd) when the lexical stress is antepenultimate, in which case violation of ALIGN-R(Ft, PrWd) is forced by the higher-ranked IDENTSTRESS. The interaction of these constraints is demonstrated in the tableaux below (all candidates respect the undominated FTBIN, which is thus left out).[9]

(4) *Lexical immobile stress* (2b)

		IDENTSTRESS	ALIGN-R	FINALSTRESS	TROCHEE
a.	galón	IDENTSTRESS	ALIGN-R	FINALSTRESS	TROCHEE
	☞ i. (ga.lón)				*
	ii. (gá.lon)	*!		*	
b.	galón-im				
	☞ i. ga(ló.nim)			*	
	ii. ga(lo.ním)	*!			*
	iii. (ga.ló)nim		*!	*	*
c.	tráktor				
	☞ i. (trák.tor)			*	
	ii. (trak.tór)	*!			*
d.	tráktor-im				
	☞ i. (trák.to)rim		*	*	
	ii. trak(to.rím)	*!			*
	iii. trak(tó.rim)	*!		*	

As shown in (5) below, in the absence of lexical stress, IDENTSTRESS is irrelevant, and FINALSTRESS determines the position of stress, and thus the foot prominence.

(5) *Final mobile stress* (2a.i)

		IDENTSTRESS	ALIGN-R	FINALSTRESS	TROCHEE
a.	gamad	IDENTSTRESS	ALIGN-R	FINALSTRESS	TROCHEE
	☞ i. (ga.mád)				*
	ii. (gá.mad)			*!	
b.	gamad-im				
	☞ i. ga(ma.dím)				*
	ii. ga(má.dim)			*!	
	iii. (ga.má)dim		*!	*	*
	iv. (gá.ma)dim		*!	*	

[9] Notice that [ga(ló.nim)] and [(galó)nim] are phonetically identical, but only the former is consistent with the foot structure assigned by the constraint ranking.

As these tableaux show, Trochee has no effect on the stress pattern, and, of course, neither does Iamb; nevertheless, iambic and trochaic feet emerge.

2.1.2 *Penultimate mobile stress.* The ranking in (3) does not account for the stems of the exclusive class of nouns, termed here 'trochaic stems' (traditionally called 'segolates'; see Bolozky 1995). In this class, (2b), stress is penultimate in the stem but final in the suffixed form (e.g. [ʃóreʃ] 'root' – [ʃoraʃ-ím] 'roots', [kéter] 'crown' – [ktar-ím] 'crowns'; vowel alternation and deletion are ignored). Since the trochaic stems exhibit mobile stress, they cannot be assumed to bear lexical stress. In the absence of lexical stress, the ranking in (3) predicts final stress in both stems and suffixed forms, as illustrated in (5) above. However, while suffixed trochaic stems exhibit final stress, the stems bear penultimate stress. I thus propose that trochaic stems are associated with a different ranking, in which Trochee outranks FinalStress.[10]

Thus, while the stress pattern in suffixed trochaic stems is accounted for by the ranking in (3) above, repeated in (6a) below, that in the bare trochaic stems requires the exclusive ranking in (6b).

(6) *Constraint ranking for stress patterns*

FtBin, IdentStress
|
Align-R
(a) / \ (b)
FinalStress | Trochee
| |
Trochee | FinalStress

The distinction between (a) and (b) in (6) is not relevant for stems with lexical stress, since the higher-ranked IdentStress ensures the

[10] There are some phonological cues that may help speakers identify trochaic stems, and thus link them with their exclusive ranking. Trochaic stems are disyllabic, and the penultimate syllable is always CV. The vowels in trochaic stems are always [–high], i.e. they can be either [e], [o] or [a] (thus [tíras] 'corn', whose stress is lexical, is never mistaken for a trochaic stem). In most cases, the first vowel in a trochaic stem is [e] and the second is [e] or [a], and since there are very few non-trochaic stems with an initial [e], [CeCe/aC] nouns will usually be identified as trochaic stems. However, stems of the shape [CoCeC] or [CaCaC] can be either trochaic (e.g. [bóker] 'morning', [náxal] 'brook') or non-trochaic (e.g. [bokér] 'cowboy', [nahár] 'river'), and speakers thus have to memorise to which class they belong. The noun [méter] 'metre' looks like a trochaic stem, but exhibits lexical immobile stress, as its suffixed form is [métr-im] (cf. the trochaic stem [kéter] – [ktar-ím]). This is probably due, as Evan Cohen (personal communication) notes, to the presence of the adjective [métri] 'metrical', which was borrowed independently of [méter]. See Becker (2003b) for the conditions under which a form can shift from one class to another.

preservation of stress in its lexical position. In the absence of lexical stress, the active constraints in trochaic stems are FtBin, Align-R(Ft, PrWd) and Trochee, which are responsible for the penultimate stress.[11]

In the alternative analysis, following Becker (2003a), all feet are trochaic (see §2.1), and thus Trochee is undominated. The ranking FinalStress ≫ FtBin accounts for final stress (e.g. [na(hár)]) and the ranking FtBin ≫ FinalStress for penultimate stress (e.g. [(náxal)]). I assume, however, following Graf & Ussishkin (2003), that FtBin (rather than Trochee) is undominated, as in (6). This is due to the role of FtBin in the prosodic morphology of Hebrew, where it assigns a minimal and maximal bound of two syllables to stems as well as derived words (although not without exceptions). Indeed, phonology and prosodic morphology do not necessarily associate with the same constraint ranking. For example, Wiese (2001) argues that the German metrical system requires a moraic trochee, but in hypocoristics a syllabic trochee emerges. However, the fact that the binary trochaic foot in Hebrew hypocoristics is relevant both to stress (in both types of hypocoristics) and to prosodic structure (in THs) suggests a unified account.[12]

The ranking in (6b) is reflected in a specific class of stems, the trochaic stems, which have a relatively low type-frequency (compared to stems with final stress). Nevertheless, as argued below, this ranking characterises all hypocoristics, whether templatic (§3) or non-templatic (§4). The emphasis is on the emergence of Trochee, whose effect in Hebrew nouns (and verbs) is evident only in trochaic stems, but is pervasive in hypocoristics. The upgraded status of Trochee puts it on par with FtBin, which together give rise to the binary trochaic foot.

2.2 Stress in proper names

Stress in Hebrew names is lexical. Names do not usually appear in their plural forms, but if they do (as in English *the Johns*), stress is immobile (Berent *et al.* 2002). A stronger argument for lexical stress in names is that

[11] I do not argue here in favour of a particular approach to multiple sub-grammars within a language (see review in Inkelas & Zoll 2003). I adopt, however, the 'co-phonology' approach, which assumes different constraint rankings for different types of constructions (Inkelas 1998 and other studies), while admitting its failure to predict that (6b) is the unmarked ranking in quantity-insensitive languages. Notice that the co-phonologies in (6) are not affix-based but rather word group-based.

[12] As suggested by a reviewer, the analysis of trochaic stems does not have to refer to Trochee. Rather, the final syllable in these stems can be marked as extrametrical (Bat-El 1993) by a high-ranked constraint Non-Finality, stating that a foot is not final in the prosodic word (Hayes 1995, Kager 1999). The resulting footing would then be $[((\text{ké})_{\text{Ft}}\text{ter})_{\text{PrWd}}]$, which suggests the ranking Non-Finality ≫ FtBin, Align-R(Ft, PrWd), FinalStress. This analysis provides even stronger support for the emergence of the unmarked Trochee in hypocoristics, since it implies that Trochee is entirely inactive in the language. However, this approach requires further study of Hebrew stress system, which is beyond the scope of this paper.

its position is unpredictable. For example, a trisyllabic name can bear final stress (e.g. [revitál]), penultimate (e.g. [menáxem]) or antepenultimate (e.g. [jónatan]).

In some names, stress is invariable, either final (e.g. [revitál], [hilá]) or penultimate (e.g. [míka], [tómer], [daniéla], [ʔeli(ʔ)ézer]); there are no names with invariable antepenultimate stress. However, many names exhibit variable stress, either final and penultimate (e.g. [menaxém] ~ [menáxem], [davíd] ~ [dávid], [xaná] ~ [xána]) or final and antepenultimate (e.g. [mordexáj] ~ [mórdexaj], [mixaél] ~ [míxael], [jonatán] ~ [jónatan]). This variation, often due to the distinction between lower and higher registers (in the latter, final stress is normative) may also be a matter of personal preference or trend.

Since the variation in stress is relevant for the analysis of non-THs, all possible stressed positions are indicated for every name; final stress is marked with an underline and non-final stress with acute (e.g. [jónat$\underline{\text{a}}$n], [menáx$\underline{\text{e}}$m]). When stress is invariable, it is marked with an acute (e.g. [míka], [daniéla]).

It should be noted that non-initial glottals surface only in careful and normative speech, as in [ʔahúva], which is usually pronounced as [ʔaúva]. In names with variable stress and a medial glottal, the glottal may surface only when stress is final (e.g. [gidʔón] ~ [gidón] ~ [gídon], *[gídʔon]). When stress is not final, and the glottal thus does not surface, the hiatus may be resolved by vowel deletion. This happens when the two vowels are identical (e.g. [ʔavra(h)ám] ~ [ʔávram]), or when they are unstressed in the form with the final stress (e.g. [je(h)udít] ~ [júdit]). In all other cases, the two vowels survive (e.g. [ʔimanu(ʔ)él] ~ [ʔimánuel], [ʔe(h)úd] ~ [ʔéud]). All potential sequences of two vowels are resolved in THs (e.g. [ʔe(h)úd] ~ [ʔéud] – [ʔúd-i], [ʔa(h)úva] – [ʔúv-i], [ja(ʔ)akóv] ~ [jákov] – [ják-i], [jisra(ʔ)éla] – [rél-i].

3 Templatic hypocoristics

As exemplified in Table II, THs come in various forms when their correspondence to their base is considered: left-anchored, misanchored and reduplicated, again, either left-anchored or misanchored.[13] In left-anchored THs the leftmost segment corresponds to the leftmost segment in the base word (e.g. [menáx$\underline{\text{e}}$m] – [méni]), and in misanchored THs it does not (e.g. [menáxem] – [náxi], [xémi]). However, all THs conform to the same prosodic structure, consisting of a trochaic syllabic foot, i.e. two syllables and penultimate stress. Morphologically, most THs have the suffix *-i*, which resides in the weak syllable of the foot. A few reduplicated THs do not have a suffix.

[13] Misanchored THs are common in base names with an initial glottal, where glottals, and to a lesser degree also [r], are disfavoured in THs.

base name	left-anchored		misanchored	
	non-reduplicated	reduplicated	non-reduplicated	reduplicated
menáxem	méni		náxi, xémi	
ʔasáf	ʔási		sáfi	
jósef	jósi		séfi	
ʔalíza	ʔáli		lízi	zázi, záza
tíkva	tíki			
dóron	dóri	dódi, dódo		
me(ʔ)íra		méme		
hadás			dási	
ʔája				jája

Table II
Types of templatic hypocoristics.

As this paper is concerned with the prosodic structure of hypocoristics, I ignore the different possible segmental make-up exemplified above, as well as the free variation. To simplify the matter, only left-anchored THs are presented in the rest of this paper.

All THs, regardless of their segmental make-up, consist of a binary trochaic foot, i.e. $((\acute{\sigma}\sigma)_{\mathrm{Ft}})_{\mathrm{PrWd}}$, where the suffix *-i* resides in the weak syllable of the foot. When the base name is too long to fit into the template, some segments are truncated (7a). CVC names do not undergo truncation, since, together with the suffix, they fit perfectly into the template (7b).[14]

(7) *Template satisfaction*

a. *Names requiring truncation* | b. *Names fitting perfectly*

a.		b.	
menáxem	mén-i <axem>	rút	rút-i
ʔodélja	ʔód-i <elja>	ʃír	ʃír-i
koxáva	kóx-i <ava>	dán	dán-i
mírjam	mír-i <jam>	róm	róm-i
tíkva	tík-i <va>	tál	tál-i
mázal	máz-i <al>	gád	gád-i
xána	xán-i <a>	rán	rán-i

This type of truncation, called templatic truncation or fake truncation (Bat-El 2002a), is found in hypocoristics and clippings in various languages (see examples at the end of the section).

14 There is one CV name in Hebrew, [li], for which the reported hypocoristics are [láli] and [líli].

The disyllabic structure of THs is expressed by two markedness constraints: PRWD=FT and FTBIN.[15] PRWD=FT limits the prosodic word to no more and no less than one foot, and thus rules out prosodic words with unparsed syllables ($*(\sigma(\sigma\sigma)_{\mathrm{Ft}}\sigma)_{\mathrm{PrWd}}$) or two feet ($*((\sigma\sigma)_{\mathrm{Ft}}(\sigma\sigma)_{\mathrm{Ft}})_{\mathrm{PrWd}}$). FTBIN limits the foot to no more and no less than two syllables, and thus rules out monosyllabic feet ($*(\sigma)_{\mathrm{Ft}}$), as well as feet with more than two syllables ($*(\sigma\sigma\sigma)_{\mathrm{Ft}}$). These two constraints are undominated in THs, and thus the only possible structure is $((\sigma\sigma)_{\mathrm{Ft}})_{\mathrm{PrWd}}$. The constraint assigning foot prominence is TROCHEE, whose dominance with respect to IAMB makes the latter ineffective. These three markedness constraints, PRWD=FT, FTBIN and TROCHEE, thus define the structure $((\acute{\sigma}\sigma)_{\mathrm{Ft}})_{\mathrm{PrWd}}$.

Due to the size limit imposed by PRWD=FT and FTBIN, truncation of excessive segmental material is inevitable. Therefore these constraints have to outrank the faithfulness constraint MAX, which prohibits deletion of segments from the base name. Note that the base of a hypocoristic is a surface form, and thus MAX is an output–output constraint. The constraint ranking is thus as follows:

(8) *Constraint ranking for templatic hypocoristics*
PRWD=FT, FTBIN, TROCHEE ≫ MAX

Given the penultimate stress in THs, the constraints FTBIN and TROCHEE dominate FINALSTRESS, as they do in the ranking of the stress pattern of the trochaic stems in (6b), repeated below:

(9) *Constraint ranking for trochaic stems*
FTBIN, IDENTSTRESS ≫ ALIGN-R(Ft, PrWd), TROCHEE ≫ FINALSTRESS

IDENTSTRESS and ALIGN-R(Ft, PrWd) are also respected by THs. As THs consist of one foot only, this foot is obviously aligned with the right edge of the prosodic word, thus respecting ALIGN-R(Ft, PrWd). Due to the truncation imposed by the ranking PRWD=FT ≫ MAX, a TH preserves only one syllable of the base name (the other syllable is occupied by the suffix *-i*). If this syllable is stressed in the name, IDENTSTRESS is respected (e.g. [jónatan] – [jón-i]). If any other syllable is stressed in the name, IDENTSTRESS is vacuously respected (e.g. [cipóra] – [cíp-i]), since the stressed syllable of the base name is not present in the hypocoristic (recall that IDENTSTRESS is relevant only when the stressed syllable of the base name survives in the hypocoristic). Thus, the constraint ranking associated with the limited class of trochaic stems is also associated with THs. As will be shown in §4, it is also associated with non-THs.

As the discussion above suggests, Hebrew THs do not display the characteristics associated with the non-concatenative morphology of Semitic languages. Semitic-type hypocoristics, as shown in Zawaydeh & Davis (1999) and Davis & Zawaydeh (2001) for Jordanian Arabic, display

[15] Following the non-templatic approach, the templatic constraint PRWD=FT can be replaced with ALIGNEDGE(Ft, PrWd), which requires the edges of every foot to align with the edges of the prosodic word. See Ussishkin (2000) and references therein.

the characteristics of Semitic morphology, which involves the combination of apophony across paradigm (or fixed vocalic patterns within a category) and prosodic restrictions (Bat-El 2002b). This combination is, indeed, exhibited by the Jordanian Arabic hypocoristics, which display a fixed prosodic structure and vocalic pattern in the shape [CaCCuuC] (e.g. [basma] – [bassuum], [xaaled] – [xalluud], [samiira] – [sammuur], [marjam] – [marjuum]).

Hebrew THs are similar to THs found in languages that do not display a Semitic-type morphology (the list of languages, the types of TH and the references are by no means exhaustive). THs in Spanish (Piñeros 1998, 2000) take the shape of the binary syllabic trochaic foot, usually without a suffix (e.g. [armándo] – [árma], [manwél] – [mánu], [elβíra] – [élβi]). English TH (Weeda 1992, Benua 1997, Zadok 2002) come in two major shapes, a bimoraic trochaic foot without a suffix (e.g. [səmǽnθə] – [sǽm], [róbert] – [rób], [məlísə] – [mɛ́l]) and a disyllabic trochaic foot including the suffix *-i* (e.g. [səmǽnθə] – [sǽmi], [róbert] – [róbi], [əmǽndə] – [mǽndi]). The latter type looks exactly like Hebrew THs, as well as German THs (Itô & Mester 1997, Lee-Schoenfeld 2001, Wiese 2001; e.g. [andréas] – [ándi], [édmond] – [édi], [gabriéla] – [gábi], [háns] – [hánsi]). Serbo-Croatian THs (Zadok 2002) also have a trochaic disyllabic foot, with various gender-sensitive and gender-neutral foot internal suffixes (e.g. [jélena] – [jél-a]/[jél-ka], [dúʃanka] – [dúʃ-a], [míroslav] – [mír-an]/[mír-ko], [vládimir] – [vlád-a]/[vlád-an]). THs in Nootka (now called Nuuchahnulth; Stonham 1994) are also disyllabic, with the foot-internal suffix [-ʔis].[16] The vowel in the first syllable is always long (and mid), regardless of the length (and height) of the vowel in the base name. Since stress in Nootka falls on the leftmost heavy syllable (CVː or CVN), the foot is trochaic (e.g. [hapúːɬ] – [héːp-ʔis], [kʷíːspisiːs] – [kʷéːsp-ʔis], [ɬuč̓háːʔaqs] – [ɬóːč-ʔis], [ʕímtʃiʔat] – [ʕéːmtʃ-ʔis]). In Japanese THs (Mester 1990, Poser 1990), the binary foot is moraic, and the suffix [-tʃan] is external to the foot (e.g. [keiko]/[keizi] – [kéi-tʃan], [taroo] – [táro-tʃan], [juuzi]/[juuko] – [júu-tʃan], [gen] – [gén-tʃan]). The accent falls on the leftmost mora in the foot, suggesting a trochaic moraic foot (Shinohara 2000).

The generalisations obtained from the above-mentioned languages, including Hebrew, are that the template of a TH is a binary trochaic foot, either moraic or syllabic, with or without a suffix. When the foot is moraic, the TH has an external suffix (Japanese) or does not have a suffix at all (English [sǽm]), since the moraic foot is too small to host sufficient material from the base name plus a suffix (especially when the suffix is CVC, like in Japanese). When the foot is syllabic, the TH has an internal suffix (Hebrew, English [sǽmi], German, Serbo-Croatian, Nootka) or

[16] Syllables in Nootka allow a single consonant in the onset and as many as three non-moraic consonants in the coda. The first syllable of the TH corresponds to the first syllable of the base plus as many consonants as possible up to the next base vowel (subject to surface structure constraints). Nootka's hypocoristics could be viewed as consisting of a moraic foot and an external suffix. However, Stonham (1994) provides independent evidence for the role of the binary syllabic foot in Nootka.

does not have a suffix at all (Spanish). These generalisations are partially consistent with Downing's (2005) proposal that disyllabicity is imposed on derived words, given monosyllabic THs like English [sǽm].

4 Non-templatic hypocoristics

Non-THs are entirely faithful to their base name. There is no truncation involved, and they thus consist of the base name plus a suffix, which can be either -*i*, -*le* or both (-*i*-*le*). In addition, stress falls on the same syllable as in the corresponding base name (e.g. [cipóra] – [cipóra-le], [mixál] – [mixál-i]/[mixál-i-le]).

The absence of truncation in non-THs suggests the ranking MAX ≫ PRWD=FT, exactly the opposite of what is found in THs (8). The preservation of stress in the same position as in the full name indicates the effect of IDENTSTRESS (3b), which requires an output syllable corresponding to a stressed input syllable to be stressed. Recall that IDENTSTRESS is also active in the stress system of Hebrew nouns (see §2.1), where it preserves lexical stress and renders it immobile.

As noted in §2.2, many names in Hebrew have variable stress, either final and penultimate (e.g. [davíd] ~ [dávid]) or final and antepenultimate (e.g. [mordexáj] ~ [mórdexaj]). However, such a variation never appears in non-THs (nor in THs, of course). That is, although both [xaná] and [xána] are possible names, only [xána-le] is a possible non-TH; *[xaná-le] is ill-formed. Given that many names have variable stress, the invariable position of stress in non-THs cannot be predicted on the basis of the base name's stress, although it has to be faithful to it. Rather, the suffix selects a base such that the following patterns obtain: non-THs with -*i* bear penultimate stress, and non-THs with -*le* bear antepenultimate stress.[17] Notice that this pattern also holds for THs, which end in -*i* and bear penultimate stress. THs cannot take the suffix -*le*, since they must be disyllabic and -*le* requires antepenultimate stress (i.e. at least three syllables).

In terms of foot structure, the suffix -*i* resides in the weak syllable of a binary trochaic foot (as in THs), and the suffix -*le* attaches to the right edge of a binary trochaic foot. These properties define the subcategorisation of the suffixes (presented in (11) below with alignment constraints).[18]

[17] The only two counterexamples I know of are [ʔófer] – [ʔófer-i] and [tómer] – [tómer-i], where -*i* behaves like -*le* in terms of foot structure.

[18] A reviewer suggested that reference to the foot could be eliminated, by specifying the subcategorisation of the suffix -*i* as a stressed syllable. I assume, however, that stress implies footing, and therefore the subcategorisation of -*i* must be stated with reference to a foot. Notice that the foot-free approach cannot be applied to the suffix -*le*, which attaches to an unstressed syllable that is preceded by a stressed syllable (i.e. a trochaic foot), and not simply to an unstressed syllable (*[jónatan-le]). Moreover, contrary to the reviewer's speculations, there are no further restrictions on the type of syllable to which -*i* is attached (e.g. must be a CV syllable), although some clusters are less preferred than others (cf. [bosmát] – [bósmi] *vs.* [ʔosnát] – [ʔósi], [ʔoʃrát] – [ʔóʃi]/[ʔóʃri] *vs.* [ʔefrát] – [ʔéfi]/*[ʔéfri]).

(10) *Subcategorisation of the hypocristic suffixes*

a. $(\ldots(\acute{\sigma}\text{C-i})_{\text{Ft}})_{\text{PrWd}}$ b. $(\ldots(\acute{\sigma}\sigma)_{\text{Ft}}\text{-le})_{\text{PrWd}}$

$(\text{do}(\text{rón-i})_{\text{Ft}})_{\text{PrWd}}$ $(\text{ci}(\text{póra})_{\text{Ft}}\text{-le})_{\text{PrWd}}$

The structures in (10) are obligatory, but so is faithfulness to the position of stress in the base name (i.e. IDENTSTRESS is undominated). That is, the subcategorisation does not have the power to shift the stress from its position in the base, and the stress of the base cannot impose surface violation of the subcategorisations. When these two requirements are in conflict, a non-TH cannot be formed. However, there are very few names that cannot have a non-TH. This is due to the two possible structures in (10) and to the variable stress in many of the names.

The examples in Table III below illustrate the various strategies that allow the accommodation of these two requirements, i.e. IDENTSTRESS and the subcategorisations in (10). The examples include disyllabic and trisyllabic base names with invariable stress (a–d) and variable stress (e–f), arranged according to the position of stress and whether they end in a consonant or a vowel. Notice that every hypocoristic with *-i* (second column of hypocoristics) can be followed by *-le* (rightmost column), since *-i* resides in a trochaic foot to which *-le* can attach $((\ldots(\acute{\sigma}\text{C-}\mathit{i})_{\text{Ft}}\text{-}\mathit{le})_{\text{PrWd}})$. Similarly, *-le* can take a TH as a base (not exemplified in Table III), deriving a non-templatic hypocoristic (e.g. [cipóra]→[címp-i]→[címp-i-le]).

base names			hypocoristics		
σσ́]	C] V]	a. ʔerán b. hilá	*ʔerán-le *hilá-le	ʔerán-i *hilá-i	ʔerán-i-le *hilá-i-le
σ́σ]	C] V]	c. ʔeliézer d. cipóra	ʔeli(ʔ)ézer-le cipóra-le	*ʔeli(ʔ)ézer-i *cipóra-i	*ʔeli(ʔ)ézer-i-le *cipóra-i-le
σ́σ] ~ σσ́]	C]	e. dávid ~ e′. davíd	dávid-le *davíd-le	*dávid-i davíd-i	*dávid-i-le davíd-i-le
σ́σσ] ~ σσσ́]	C]	f. jónatan ~ f′. jonatán	*jónatan-le *jonatán-le	*jónatan-i jonatán-i	*jónatan-i-le jonatán-i-le

Table III

Possible non-templatic hypocoristics.

A name with fixed final stress can take *-i* or *-i-le* (a), and a name with fixed penultimate stress can take only *-le* (c, d). Other options are not available; stress cannot shift, due to undominated IDENTSTRESS ([ʔerán] – *[ʔéran-le]) and a segment (the final vowel) cannot delete, due to undominated MAX ([cipóra] – *[cipór-i]).[19]

[19] It looks as if in cases such as [xána] – [xán-i], [dáfna] – [dáfn-i] and [ʃlómo] – [ʃlóm-i] there is vowel deletion. However, only disyllabic names exhibit such vowel deletion,

A vowel-final name with fixed final stress (b) cannot take any suffix. It cannot take *-le*, due to its subcategorisation, nor can it take *-i* (and thus *-i-le*), due to the requirement for an onset. Onsetless syllables in a non-TH are possible only if present in the full name (e.g. [ʔa.ú.va-le]), but not in a derived environment (*[hilá-i]). To circumvent the problem, segmental material can be added via reduplication ([hilá] – [hilá**l**-i]). The power of ONSET is even stronger in THs, where hiatus in the base name is resolved by vowel deletion (e.g. [ʔa.(h)ú.va] – [ʔúv-i], [ʔé(h)ud] – [ʔúd-i]; see §2.2). This distinction is due to the different status of MAX, i.e. undominated in non-THs, but dominated by PRWD=FT and FTBIN in THs.

The other cases in Table III manipulate the variable stress found in the base names. When the variable stress is final and penultimate (e), *-i* selects the base with the final stress ([davíd-i]), and *-le* selects the base with penultimate stress ([dávid-le]).[20] When the variable stress is antepenultimate and final (f), *-i* can attach to the base with the final stress ([jonatán-i]), and *-le* can attach only after *-i* ([jonatán-i-le]).

As proposed in McCarthy & Prince (1993), affixes are assigned by alignment constraints, which specify the unit to which an affix is aligned (prosodic or morphological), as well as the edge (left or right). As McCarthy & Prince indicate, alignment constraints of affixation may place the affixes in two different positions with respect to the unit to which they attach: within the unit ('ALIGN-IN-UNIT') or outside the unit ('ALIGN-TO-UNIT'). This is actually the distinction between the suffixes *-i* and *-le*, as stated by the following affixation constraints.

(11) ALIGN(aff) *constraints*

a. ALIGN (*i*-R, Ft-R)$_{\mathrm{Hypo}}$ (ALIGN-IN-FOOT)
Align the right edge of *i* with the right edge of a foot $(\ldots i)_{\mathrm{Ft}}$.

b. ALIGN (*le*-L, Ft-R)$_{\mathrm{Hypo}}$ (ALIGN-TO-FOOT)
Align the left edge of *le* with the right edge of a foot $(\ldots)_{\mathrm{Ft}} le$.

The alignment constraints state the position of the suffix with respect to the foot. The size of the foot and its prominence are determined by the undominated markedness constraints FTBIN (3a) and TROCHEE (3e). These two constraints, together with the ALIGN(aff) constraints in (11), define the subcategorisation of the suffixes.[21]

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and therefore it is safe to assume that these are THs, and that there is no vowel deletion in non-templatic hypocoristics.

[20] It should be noted that there is a slight preference for hypocoristics without a coda in the penultimate syllable, which means that some speakers are hesitant to accept [dávid-le] (e) and [ʔeliézer-le] (c).

[21] The notion of subcategorisation was introduced in Chomsky (1965) to indicate the syntactic frame of lexical categories (e.g. a transitive verb is subcategorised for an NP complement). In morphology, subcategorisation specifies, in lexical entries (Lieber 1980) or morphological rules (Kiparsky 1982), the category and features of the stem to which an affix can be attached (e.g. the English suffix *-ee* is subcategorised for transitive verbs; see Aronoff 1976 for further restrictions). Subcategorisation can prescribe a subset of items with specific properties, and/or

I assume, following Russell (1995, 1999), that the affixes are introduced through the constraints, i.e. they are not given as part of the input (but I do not adopt his proposal that stems are introduced through constraints). An alignment constraint of affixation, specified for a morphological class (in our case 'Hypo'), not only states the position of the affix with respect to the base, but also requires the output representation to include the affix. Thus, the input of a hypocoristic consists of a base name plus a specification of whether the required output is TH or non-TH (see further support in Yip 1998, Hammond 2000 and Adam & Bat-El 2000, as well as a critical view in Bonet 2004).

The subcategorisation constraints account for two other properties: (i) the fact that a TH cannot take *-le* (since it would then be trisyllabic; see (13) below), and (ii) the fixed order of the suffixes, as in [davíd-i-le] (since *-le* is attached to the foot in which *-i* resides). Therefore the two subcategorisation constraints in (11) are not ranked with respect to each other. The order of the suffixes could be also attributed to ONSET, which rules out the sequence **-le-i* due to the missing onset. Actually, it may look as if the different behaviour of the suffixes could be attributed to the effect of ONSET, given the prosodic distinction of vowel-initial (*-i*) *vs.* consonant-initial (*-le*) suffixes. However, as will be argued at the end of this section, an analysis without subcategorisation fails to produce multiple outputs.

The ALIGN(aff) constraints are violated when the subcategorisation of the suffix is not met, i.e. when the suffix does not appear in its designated position with respect to the foot (e.g. *[(xa(ná-le))], *[((dávi)d-i)]). In addition, as noted above, a candidate is assigned a violation mark for a missing suffix. Thus, the null parse (the candidate without a suffix) gets two violation marks, one under ALIGN(*le*) and another under ALIGN(*i*), and a candidate with one suffix gets only one violation mark. However, under this system of violation marking, a candidate with two suffixes, like [davíd-i-le], which does not get any violation marks, defeats the candidates with one suffix. Of course, this is an undesirable result, since X-*i*, X-*le* and X-*i*-*le* are equally well formed. That is, only the violation of the two ALIGN(aff) constraints is critical; otherwise, there is no difference between candidates violating only one of the constraints or none.

Such a state of affairs calls for the operation of constraint conjunction, first proposed in Smolensky (1995, 1997). This operation allows the conjoined constraint to have the power that each of its members alone does not have. I assume that the two constraints in (11) appear as the conjoined constraint ALIGN(*i*)&ALIGN(*le*), which is violated only when both its members are violated. The literature on constraint conjunction (see Ito & Mester 2003 and references therein) acknowledges that this operation is given more power than is actually attested, as not every two constraints can be conjoined. In order to reduce the power of this operation, it has been proposed that the conjoined constraints have to be specified for a

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enforce changes such that the item will satisfy the subcategorisation (see Alderete 1999). This distinction can be obtained by constraint interaction.

domain shared by the two constraints. In the case under consideration here, the domain is morphological, i.e. hypocoristics. The conjoined constraint is thus ALIGN(*i*)&$_{\text{M:Hypo}}$ALIGN(*le*), where M:Hypo (M for morphology) stands for the shared domain.

(12) below is designed to illustrate how the conjoined constraint operates, thus ignoring all other constraints and the candidates they rule out. There are two possible inputs for [david], one with penultimate stress and another with final stress. The violation marks for each member of the conjoined constraint are in parentheses, accompanied by an indication whether the violation is due to the absence of a suffix (A) or to an unfulfilled subcategorisation (S). The violation marks for the conjoined constraint are in the middle.

(12) [dávid] ~ [davíd] – [davíd-i]/[dávid-le]/[davíd-i-le]

dávid, davíd (non-TH)	ALIGN(*i*)	&	ALIGN(*le*)
a. (dávi)d-i	(*^{S})	*	(*^{A})
☞ b. da(víd-i)			(*^{A})
☞ c. (dávid)-le	(*^{A})		
d. da(víd-le)	(*^{A})	*	(*^{S})
☞ e. da(víd-i)-le			
f. da(víd-le)-i	(*^{S})	*	(*^{S})
g. dávid	(*^{A})	*	(*^{A})

The candidates that violate only one member of the conjoined constraint (b, c), or none (e), satisfy the conjoined constraint. Thus, the candidate with two suffixes (e) is as good as the candidates with one suffix (b, c). The candidates that violate both members (a, d, f, g), regardless of the reason for the violation, violate the conjoined constraint. Notice that the null candidate (g) violates both members of the conjoined constraint, since under the affix-as-constraint approach an alignment constraint requires the presence of the affix in the output. This requirement does the job of MPARSE, in the analyses of the null parse in Prince & Smolensky (1993) and Raffelsiefen (1996, 2004); see Orgun & Sprouse (1999) for an alternative approach.

This same conjoined constraint is active in THs, where only the suffix -*i* can appear.

(13) [cipóra] – [cíp-i]

cipóra (TH)	PRWD=FT	ALIGN(*i*)	&	ALIGN(*le*)
a. (ci(póra)-le)$_{\text{PrWd}}$	*!	(*^{A})		
b. ((cíp-i)-le)$_{\text{PrWd}}$	*!			
c. ((cíp-le))$_{\text{PrWd}}$		(*^{A})	*!	(*^{S})
☞ d. ((cíp-i))$_{\text{PrWd}}$				(*^{A})

PrWd=Ft rules out the first two candidates, which exceed the disyllabic maximum. These candidates are optimal under the ranking of non-TH, though the base of (a) is the name [cipóra] and that of (b) is the TH [cípi]. Candidate (c) represents a TH with the suffix -*le*, which violates the conjoined constraint because the suffix -*i* is missing and the subcategorisation of the suffix -*le* is not met. Therefore, only the suffix -*i* can appear in THs.

Taking into account a larger variety of candidates and constraints, the following tableau presents the selection of a non-TH from a base name with fixed final stress. To reduce cluttering, the tableau does not include the inviolable Max or the low-ranked violated PrWd=Ft.

(14) [ʔerán] – [ʔerán-i]/[ʔerán-i-le]

ʔerán (non-TH)	IdentStress	FtBin	Trochee	Align(*i*)	&	Align(*le*)
☞ a. ʔe(rán-i)						$(*^{A})$
b. (ʔéran)-i	*!			$(*^{S})$	*	$(*^{A})$
c. (ʔéran)-le	*!			$(*^{A})$		
d. ʔe(rán)-le		*!		$(*^{A})$		
e. ʔe(rán-le)				$(*^{A})$	*!	$(*^{S})$
☞ f. ʔe(rán-i)-le						
g. (ʔerán)			*!	$(*^{A})$	*	$(*^{A})$

The suffix -*le* cannot attach directly to a name with fixed final stress, due to either IdentStress (c), FtBin (d) or Align(*i*) & Align(*le*) (e).

Similarly, as shown below, -*i* cannot attach to a base name with fixed penultimate stress (a, b), and therefore the candidates with -*i*-*le* (e, f) are also ill-formed (Max, FtBin and Trochee are ignored).

(15) [ʔajélet] – [ʔajélet-le]

ʔayélet (non-TH)	IdentStress	Align(*i*)	&	Align(*le*)
a. ʔaje(lét-i)	*!			$(*^{A})$
b. ʔaj(élet)-i		$(*^{S})$	*!	$(*^{A})$
☞ c. ʔa(jélet)-le		$(*^{A})$		
d. ʔaje(lét-le)	*!	$(*^{A})$	*	$(*^{S})$
e. ʔaj(élet)-i-le		$(*^{S})$	*!	$(*^{S})$
f. ʔaje(lét-i)-le	*!			
g. ʔa(jélet)		$(*^{A})$	*!	$(*^{A})$

The tableaux above suggest the following ranking:

(16) *Ranking for non-templatic hypocoristics*
Max, IdentStress, Trochee, FtBin, Align(*i*) & Align(*le*) ≫ PrWd=Ft

MAX, crucially ranked above PRWD=FT, blocks truncation. IDENTSTRESS does not allow stress to shift to accommodate the subcategorisation of the suffixes. Nevertheless, the subcategorisation must be met, given that the conjoined constraint ALIGN(*i*) & ALIGN(*le*) is also undominated. The subcategorisation refers to a foot, and this foot is restricted to a binary trochaic foot by the undominated constraints TROCHEE and FTBIN.[22]

While the null candidate (without any suffix) usually loses, due to the violation of ALIGN(*i*) & ALIGN(*le*), there are cases where it wins. As noted above, vowel-final names with fixed final stress lack a non-TH (e.g. [hilá], [advá], [naamá], [ʔidó], [roʔí]), although there are a few exceptions, either with reduplication (e.g. [hilá] – [hiláli]) or a different suffix ([roʔí] – [roʔíki]). Due to the fixed final stress, such names cannot take *-le*; *[híla-le] violates IDENTSTRESS, *[hi(lá-le)] does not meet the subcategorisation of *-le* and *[hi(lá)-le] violates FTBIN. However, *-i* can also not attach to such names (*[hilá-i]), due to ONSET. As noted earlier, onsetless syllables may appear in full names (e.g. [na.a.má] and [ʔa.ú.va]), in which case they persist in the hypocoristics (e.g. [ʔa.ú.va-le]). However, derived onsetless syllables are not acceptable in hypocoristics.

The emergence of ONSET in derived environments and the selection of the null parse as the optimal candidate suggest that ONSET outranks ALIGN(*i*) & ALIGN(*le*). The onsetless syllable could be rescued by epenthesis or deletion, but both are impossible procedures (ignoring the exceptions noted above), since DEP and MAX are ranked above ALIGN(*i*) & ALIGN(*le*).

(17) [ʔadvá] – null parse (*a non-TH is not available*)

ʔadvá (non-TH)	MAX	DEP	ONSET	ALIGN(*i*) & ALIGN(*le*)
a. ʔad.(vá.-i)			*!	
b. ʔad.(vá.C-i)		*!		
c. (ʔád.v-i)	*!			
☞ d. ʔad.vá				*

The same constraint ranking accounts for the persistence of onsetless syllables in non-derived environments, i.e. when they appear in the base name. In this case, as shown in (18), both the null parse (d) and the suffixed form (a) survive DEP and MAX and violate ONSET. Therefore, the lower-ranked ALIGN(*i*) & ALIGN(*le*) can select the optimal candidate, the one with the suffix.

[22] I assume that a single syllable outside the binary trochaic is not footed, i.e. that the prosodic structure of a hypocoristic like [cipóra-le] is [(ci(póra)$_{\mathrm{Ft}}$le)$_{\mathrm{PrWd}}$], rather than [((ci)$_{\mathrm{Ft}}$(póra)$_{\mathrm{Ft}}$(le)$_{\mathrm{Ft}}$)$_{\mathrm{PrWd}}$]. Thus, the constraint requiring a syllable to be parsed into a foot should be ranked below FTBIN. When the foot hosting the suffix is preceded by two syllables, another trochaic foot can be assumed, as in [((jona)$_{\mathrm{Ft}}$ (tan-i)$_{\mathrm{Ft}}$le)$_{\mathrm{PrWd}}$].

(18) [ʔaúva] – [ʔaúva-le]

ʔaúva [non-TH]	MAX	DEP	ONSET	ALIGN(*i*) & ALIGN(*le*)
☞ a. ʔa.(ú.va.)-le			*	
b. ʔa.(Cú.va.)-le		*!		
c. (ʔú.va.)-le	*!			
d. ʔa.(ú.va)			*	*!

With the addition of the cases where the null parse is optimal, the following rankings are required:

(19) *Constraint rankings for non-templatic hypocoristics*

a. DEP, MAX ≫ ONSET
Do not insert or delete base segments; retain onsetless syllables.

b. ONSET ≫ ALIGN(*i*) & ALIGN(*le*)
Avoid onsetless syllables; do not attach a suffix.

c. MAX ≫ PRWD=FT
Do not delete base segments; retain a prosodic word larger than a foot.

d. IDENTSTRESS ≫ ALIGN(*i*) & ALIGN(*le*)
Do not shift stress from its base position; retain a base without a suffix.

e. TROCHEE
Have a trochaic foot.

f. FTBIN
Have a binary foot.

The analysis above accounts for the simultaneous selection of several non-THs, which is performed by the constraint ranking. It reflects the state of affairs in the language, where different speakers select different forms. However, it is also possible that the same speaker will select different forms on different occasions, or with reference to different people. Therefore, the simultaneous selection of non-THs must be maintained for both interlanguage and interspeaker variation.

There is an alternative analysis, which relies on the prosodic distinction between the two suffixes, vowel-initial (-*i*) *vs*. consonant-initial (-*le*). This analysis does without constraint conjunction and subcategorisation, but it cannot maintain the simultaneous selection achieved by the analysis proposed above. This analysis, to which I will refer as the alignment analysis (as opposed to the earlier subcategorisation analysis), does not assign any properties to the suffixes beyond simple suffixation, i.e. ALIGN-R(aff, stem). The different behaviour of the suffixes is derived from their different structure, V *vs*. CV, by two constraints of the alignment family, one being a faithfulness constraint and the other a markedness constraint. The faithfulness constraint, ANCHOR, requires alignment between the right edge of the prosodic word in the input (base name) and a right edge of a foot in the output (hypocoristic). The markedness constraint, ALIGN, which refers only to the output, requires alignment between the right edge of the prosodic word and the right edge of a foot.

(20)		ANCHOR-R($PrWd^I$, Ft^O)	ALIGN-R($PrWd^O$, Ft^O)
	input	$\ldots\sigma_i)_{PrWd}$	
	output	$\ldots\sigma_i)_{Ft}$	$\ldots\sigma)_{Ft})_{PrWd}$

The ranking for both suffixes is ANCHOR-R ≫ ALIGN-R, but for each suffix another constraint turns to select the optimal candidate. As shown below, when -*i* is added (21a), both candidates violate ANCHOR-R, since the final coda of the base name has to surface as the onset of the vocalic suffix, due to the higher-ranked constraint ONSET.[23] The latter, as in the subcategorisation analysis, has to outrank ALIGN(aff) in order to account for the null parse for base names with final stressed vowel (*[hilá-i]). Consequently, ALIGN-R must select the optimal candidate. When the suffix -*le* is added, there is no resyllabification, as the suffix begins with a consonant, and the dominant constraint ANCHOR-R selects the optimal candidate. Notice that base names with variable stress are available. The appropriate base is not selected by the suffix but rather by the constraint ranking (all candidates respect FTBIN, TROCHEE, MAX, DEP and IDENTSTRESS; ‖ marks the right edge of the input's prosodic word).

(21) a.	(dávid)$_{PrWd}$, (davíd)$_{PrWd}$ (non-TH)	ONSET	ALIGN(aff)	ANCHOR-R	ALIGN-R
	☞ i. (da(víd‖-i)$_{Ft}$)$_{PrWd}$			*	
	ii. ((dávi)$_{Ft}$d‖-i)$_{PrWd}$			*	*!
	iii. ((dávid‖)$_{Ft}$-i)$_{PrWd}$	*!			*
	iv. ((dávid‖)$_{Ft}$)$_{PrWd}$		*!		
b.	(dávid)$_{PrWd}$, (davíd)$_{PrWd}$ (non-TH)				
	i. (da(víd‖-e)$_{Ft}$)$_{PrWd}$			*!	
	☞ ii. ((dávid‖)$_{Ft}$-le)$_{PrWd}$				*
	iii. ((dávid‖)$_{Ft}$)$_{PrWd}$		*!		

The problem with this approach is that each suffix has to be evaluated independently. Within a single evaluation, as shown below, only one of the three possible hypocoristics is selected as optimal. ☜ indicates an actual, but non-optimal form.

[23] While a syllable can be dominated directly by the prosodic word, in violation of the Strict Layer Hypothesis (Selkirk 1984), it cannot be split between two feet.

(22) *The wrong prediction of a single evaluation*

$(\text{dávid})_{\text{PrWd}}$, $(\text{davíd})_{\text{PrWd}}$ (non-TH)	ONSET	ALIGN(aff)	ANCHOR-R	ALIGN-R
☜ a. $(\text{da}(\text{víd}\,\Vert\text{-i})_{\text{Ft}})_{\text{PrWd}}$			*!	
☞ b. $((\text{dávid})_{\text{Ft}}\text{-le})_{\text{PrWd}}$				*
☜ c. $(\text{da}(\text{víd}\,\Vert\text{-i})_{\text{Ft}}\text{-le})_{\text{PrWd}}$			*!	*

Candidate (c), with the two suffixes, is harmonically bounded, as it violates both ANCHOR-R and ALIGN-R; the right edge of the foot is not aligned with the right edge of the prosodic word (violation of ALIGN-R), and the right edge of the input prosodic word is not aligned with the right edge of the foot (violation of ANCHOR-R). It thus has no chance against the other two candidates. Candidate (b), with *-le*, is better than (a), with *-i*, due to the ranking ANCHOR-R ≫ ALIGN-R, which was established in (21b).

As shown above, the alignment approach, which does away with subcategorisation, fails to account for the fact that all the candidates in (21) are equally well formed, and they are all available to the same speaker. Indeed, as observed in note 1, *-i* and *-le* do not have the same status in the language, and it is thus possible to assume independent evaluations. However, speakers who use *-le* also use *-i-le*, which, as shown in (22), has no chance of winning against *-le*.

Under the subcategorisation analysis proposed here, it is the task of the constraint ranking to determine which suffix is attached to which forms of the base name. That is, a single ranking provides all the possible non-THs. The basis for selecting one of them in a particular context is at most pragmatic, but certainly not phonological or morphological.

5 Conclusion

It is not at all surprising that THs are often associated with child's speech. At the minimal word stage, children produce words that fit the binary trochaic foot. This is true for languages such as English and Dutch (Fikkert 1994, Demuth 1995, 1996, Demuth & Fee 1995), where the binary trochaic foot is prominent. However, in Hebrew too, where there is no evidence of one specific foot (see §2.1), the acquisition path reflects the preference of the binary trochaic foot (Ben-David 2001, Adam 2002, Adi-Bensaid & Bat-El 2004).

Hypocoristics, like the children's words at the minimal word stage, reflect the emergence of the unmarked binary trochaic foot. It has been shown that the effect of TROCHEE in Hebrew is limited mostly to trochaic stems (or does not appear at all, under the extrametricality approach proposed by a reviewer). Given the low type-frequency of trochaic stems, it is unlikely that their presence in the language is the source of the structure of the hypocoristics. Rather, it is the universally unmarked status of the binary trochaic foot in quantity-insensitive languages which is responsible.

The binary trochaic foot in Hebrew hypocoristics is not limited to THs, where it affects the size and the stress pattern. It is also relevant for non-THs, where it is responsible for the stress pattern.

The distinction between templatic and non-templatic hypocoristics is thus reduced to the ranking of PRWD=FT and MAX. In THs, the ranking of these two constraints is PRWD=FT ≫ MAX, and therefore truncation of segmental material that does not fit into the binary foot is inevitable. In non-THs, the ranking is MAX ≫ PRWD=FT, and thus truncation is impossible. This limited distinction in the rankings is also responsible for the morphological difference between the two types of hypocoristic, i.e. that THs can take only *-i*, while non-THs can take *-i*, *-le* or *-i-le*. That is, in 'co-phonologies' of this type, a ranking is associated with a construction, rather than with a suffix.

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