

Typology and Boundaries: The Acquisition of a New Morphological Boundary by Modern Hebrew*

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Abstract

Despite the many changes that Modern Hebrew (MH) has undergone since its revival, its morphology seems to have remained largely intact, in that the Biblical Hebrew root-and-pattern word structure is dominant in MH as well. However, it has been pointed out (by e.g., Bolotsky 1978, Schwarzwald 2002 and many others) that even morphology is not immune from changes. Borrowed suffixes such as *-ist*, *-nik* and *-çik* have found their way into MH word formation. The extensive use of prefixes has also been regarded as foreign influence. In this paper I argue that the morphology of MH shows yet another deviation from the Biblical Hebrew structure, by acquiring not a new affix, but rather a new morphological boundary and a new level for suffixation, the # (word level) boundary. This boundary applies to words lacking the canonical root-and-pattern structure (that is, borrowings, acronyms, names and compounds). The affixation of the # suffixes to these words does not cause stress shift to the suffix (these suffixes were stress-attracting in earlier stages of the language, even in borrowed forms). This accounts for the distinct stress pattern exhibited by some inflected and derived forms of non-canonical words. One consequence of this change is that MH developed several default suffixes, (in the sense of Kiparsky 1973, Aronoff 1976), e.g., in the plural and feminine forms. Another consequence of this change is the emergence of two distinct gender systems in MH, one that does not constitute an inflectional class (in the sense of Aronoff 1994), and one that does. The suggested analysis also ties together several observations and analyses concerning plural formation and stress assignment in the nominal system of MH, which previously were not regarded as related.

1. Plural Affixation in Hebrew

Nouns in Hebrew fall into two gender classes, masculine and feminine. There is a rather strong correlation between the phonological form of a noun and its gender. The feminine is the marked gender, feminine nouns typically ending with *-a* (e.g., *simxa* ‘happiness’) or *-ut/-it/-et/-at* (*xanut* ‘shop’, *xavit*, ‘barrel’, *rakevet* ‘train’, *tsalaxat* ‘plate’). Masculine nouns are unmarked: nouns lacking a feminine ending are masculine. However, this correlation is not entirely consistent. Some masculine-sounding nouns, that is nouns which do not have a feminine ending, are nonetheless feminine (e.g., *zeven* ‘stone’, *zerets* ‘country/land’, *tsipor* ‘bird’), and a smaller number of nouns ending with *-a* or *-it/-et* are masculine (*layla* ‘night’, *tsevet* ‘crew’, *ramit* ‘colleague’).

Hebrew has two nominal plural suffixes: *-im* and *-ot*. The latter has several allomorphs: *-iyot/uyot*, and *-a?ot*. Masculine nouns usually take the *-im* suffix, and feminine nouns the *-ot* suffix.¹ Once again, the correlation is not entirely consistent.

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¹When the feminine plural suffix *-ot* attaches to words ending with *-a*, it replaces the vowel in word final position: *?agala* – *?agalot* (‘wagon’).

Aronoff (1994) notes that there are about 80 masculine nouns in current use taking the *-ot* suffix, and 30 or so feminine nouns taking the *-im* suffix. Thus the choice of plural suffix cannot be inferred from the gender of the noun. Furthermore, it cannot be reliably inferred from the phonological form of the noun: feminine-sounding nouns may take the *-im* suffix², and some masculine-sounding nouns take the *-ot* suffix. Hence, although "...the morphological structure along with gender marking are the main causes for the choice of the plural suffix" (Schwarzwald 1991: 596), neither the gender nor the phonological structure of the base can fully predict the choice of the plural suffix (as illustrated in table 1 below). The specific phonological form and the choice of plural suffix have to be stated for each noun *independently* (Aronoff 1994: 78), which means that there are no noun paradigms in the language. Therefore, gender in Hebrew is not an inflectional class (in the sense of Aronoff 1994, that is the set of lexemes whose members each select the same set of inflectional realizations).³

Noun gender	Regular		Irregular	
Masculine	<i>xof – xofim</i>	‘beach’	<i>kol – kolot</i>	‘voice’
Feminine	<i>?erets – ?aratsot</i>	‘country/land’	<i>?even – ?avanim</i>	‘stone’
Phonological form				
Masculine sounding	<i>maxfev – maxfevim</i> (m.)	‘computer’	<i>mafteax – maftexot</i> (m.)	‘key’
Feminine sounding	<i>layla – leylot</i> (m.)	‘night’	<i>nemala – nemalim</i>	‘ant’

Table 1: The unpredictability of plural formation in Hebrew.

Plural formation in Hebrew is yet irregular in another way. Plural affixation usually shifts the stress to the suffix. This stress shift may result in additional phonological changes to the base. Though the Mishkal (pattern) of the singular form is a good predictor of these phonological changes (Berent et. al 1999), their occurrence is nonetheless not always predictable. For example, in *gamad – gamadim* (‘dwarf’) plural inflection does not alter the base, but in the phonologically similar *gamal – gmalim* (‘camel’), suffixation causes the deletion of a vowel in the stem. Similarly, in *xanit – xanitot* (‘spear’), suffixation does not change the base, whereas in *mapit – mapiyot* (‘napkin’), suffixation results in the deletion of the feminine suffix (*-it*) of the base (Schwarzwald 1991: 601). Thus, plural formation in Hebrew is irregular in two ways: both the choice of the plural suffix (*-im* or *-ot*) and the phonological changes caused by

² In Schwarzwald’s (1991;595) dictionary count, she found that out of 3926 nouns with a feminine ending, 69 took the *-im* suffix.

³ The gender of Hebrew nouns is reliably revealed only by agreement. Agreeing adjectives, verbs and participles agree in gender with the noun. Thus, an adjective modifying a feminine noun is morphologically marked as feminine, whether or not the noun is phonologically marked as feminine (e.g., *?even levan-a* ‘a white (fem.) stone (fem.)’). Similarly, the choice of the plural suffix in adjectives is entirely predictable from the gender of the head noun: adjectives modifying masculine plural nouns take the *-im* suffix, and adjectives accompanying feminine plural nouns take the *-ot* suffix. The predictability of plural marking in adjectives led Schwarzwald (1991) to suggest that adjectival pluralization takes place in the grammar, while nominal pluralization takes place in the lexicon.

suffixation are not reliably predictable from the phonological form or the gender of the base.⁴

2. Plural Formation and Stress

Plural affixation generally shifts the stress to the suffix, e.g.: *sipur* – *sipurim* (‘story’ m.); *rakevet* – *rakavot* (‘train’ f.). However, there is a class of nouns in which the stress does not shift to the plural affix. This class includes words which are outside of the canonical root-and-pattern word formation structure,⁵ (referred to by Berent et. al. 1999 as words lacking a canonical root). It consists of the following sub-classes:

Borrowings:	<i>student</i> – <i>studentim</i> ‘student’, <i>banana</i> – <i>bananot</i> ‘banana’
Words containing a borrowed affix:	<i>kibutsnik</i> – <i>kibutsnikim</i> ‘a Kibutz member’ (m.) <i>kibutsnikit</i> – <i>kibutsnikiyot</i> ‘a Kibutz member’ (f.)
Acronyms:	<i>rabat</i> – <i>rabatim</i> (<i>rav</i> – <i>turai</i> , ‘corporal’) <i>tatsa</i> – <i>tatsot</i> (<i>tatslumei</i> – <i>?avir</i> ‘aerial photographs’)
Nouns used as proper names:	<i>?afik</i> – <i>?afikim</i> ‘the Afik family’ <i>dina</i> – <i>dinot</i> ‘the Dina’s
Some blends:	<i>midrexov</i> – <i>midrexovim</i> ‘pedestrian walkway’
Some highly lexicalized compounds:	<i>kadursal</i> – <i>kadursalim</i> ‘basketball’

When suffixation does not result in stress shift, there are also no accompanying phonological changes in the base. Thus, the plural of the noun *barak* (‘lightening’) is *brakim*, exhibiting the expected vowel change. But when used as a family name, its plural form is *Barakim*, with no stress shift and no vowel change (Berent et. al 1999: 31)⁶. Plural suffixation, then, applies very differently to canonical vs. non-canonical

⁴ As pointed out in fn. 1, pluralization of adjectives is much more regular than that of nouns, in that the choice of the plural suffix can be fully inferred from the gender of the head noun. However, even in adjectives, the phonological changes to the based caused by suffixation are not fully predictable, as in the following examples: *gadol* – *gdolim* ‘big’ vs. *varod* – *vrudim* ‘pink’; *salit* – *salitim* ‘reigning’ vs. *favir* – *fvirim* ‘fragile’.

⁵ In addition to nouns constructed by the root and pattern combination, canonical words in Hebrew include also most nouns formed by stem+Hebrew suffix (as opposed to borrowed suffixes), whether the stem is of Hebrew origin or not, e.g., *traktoron* – *traktoronim* (‘Dune buggy’). Some foreign stems, though, exhibit non-canonical behavior even when they combine with a Hebrew suffix, e.g., *politikai* – *politikaim* ‘politician’. See Schwarzwald 2002, for further discussion.

⁶ The only possible phonological change to the base is stress shift. When a stressless suffix attaches to a base with stressed antepenult, stress often shifts to the penult in the suffixed form, as in *?otobus* – *?otobusim* (‘bus’), *telefon* – *telefonim* (‘telephone’). This stress shift occurs in some forms but not in

words. In the former, the plural suffix is stress-attracting, and suffixation may result in phonological changes to the base. In the latter, the plural suffix does not attract stress, and suffixation does not cause phonological changes to the base.

The plural suffixes are not the only suffixes in the languages exhibiting such a dual behavior. There are few other suffixes characterized by dual behavior when attached to canonical vs. non-canonical words (Schwarzwald 2002):

The suffix	Canonical word	Non-canonical word
Feminine inflection <i>-it</i>	<i>rakdan</i> – <i>rakdanit</i> 'dancer'	<i>rabat</i> – <i>rabatit</i> 'corporal'
Adjectivizing suffix <i>-i</i>	<i>šemeš</i> – <i>šimšī</i> 'sunny'	<i>tel-šaviv</i> – <i>tel-šavivi</i> 'Tel-Aviv' – 'Tel-Avivian'
A derivational suffix forming abstract nouns <i>-(iy)ut</i>	<i>yeled</i> – <i>yaldut</i> 'child' – 'childhood'	<i>šlumper</i> – <i>šlumperiyut</i> 'slob' – 'slobbishness' <i>diva</i> – <i>divaiyut</i> 'diva' – 'diva-ness'

Table 2: Dual-behavior suffixes

However, not all suffixes exhibit such dual behavior. Some suffixes are consistently stress-attracting, even when affixed to non-canonical words. (Bat-El 1993, Schwarzwald 2002).

The suffix	Canonical word	Non-canonical word
<i>-an</i>	<i>sefer</i> – <i>safran</i> 'book' – 'librarian'	<i>solo</i> – <i>solan</i> 'solo' – 'solist'
<i>-iya</i>	<i>sefer</i> – <i>sifriya</i> 'book' – 'library'	<i>djunk</i> – <i>djunkiya</i> 'junk yard'
<i>-ai</i>	<i>šiton</i> – <i>šitonai</i> 'journal' – 'journalist'	<i>bank</i> – <i>bankai</i> 'bank' – 'banker'
<i>-on</i>	<i>yeled</i> – <i>yaldon</i> 'boy' – 'small child'	<i>traktor</i> – <i>traktoron</i> 'tractor' – 'dune buggy'

Table 3: Uni-behavior suffixes

Of special interest is the construct state masculine plural *-ei*. Though morphologically related to the plural suffix *-im* (Berman 1978: 75), it does not exhibit the dual behavior of *-im*. Rather, it consistently attracts stress. Thus, in non-canonical words construct state plurals and free state plurals show different stress patterns:

- (1) a. *milyon* – *milyonim* ('million') *kurs* – *kursim* ('course')
- b. *milyonei* 'anašim' ('millions of people'), *kursei-mavo* ('introductory courses')

others, and varies among speakers (Bat-El 1993). It can also be attested in some adjectives derived from penult bases (*london* – *londoni* 'a Londoner').

The above facts indicate that stress shift or the lack of it is not a property of bases or of suffixes by themselves. The same base may either retain its stress in suffixation or not, depending on the suffix (as in 1.a-b). Conversely, the same suffix may or may not attract stress, depending on the base (as illustrated in table 2). Hence the occurrence or non-occurrence of stress shift is determined by the combination of a base and a suffix. Stress fails to shift to the suffix only when a dual-behavior suffix is attached to a non-canonical base. In all other combinations, stress shifts to the suffix.

3. Semantic and Distributional Correlates of Dual-behavior Suffixation

The two distinct phonological patterns exhibited by the dual-behavior suffixes correlate neatly with a cluster of properties. Stress-neutral suffixation is more regular and coherent than stress-shifting suffixation.

(a) *Semantics*: Stress-shifting suffixation is less coherent semantically, in that the meaning of the suffixed form is not always componential. Some plural forms have idiosyncratic meanings. For example, *ferutim* (*ferut-im*, ‘services’) has the additional meaning of ‘WC’. Others are pluralia tantum (e.g., *panim* ‘face’, *raxamim* ‘compassion’, *xayim* ‘life’, *?atikot* ‘antiquity’, *sonot* ‘miscellany’, Schwarzwald 1991,593). And there are at least two nouns which are morphologically plural, but are syntactically singular: *behemot* ‘behemoth /hippopotamus’ and *be?alim* ‘possessor/owner’. These nouns are homophonous with the regular plural forms *behemot* (‘beasts’) and *be?alim* (‘husbands’). In contrast, stress-neutral plural suffixes are semantically coherent: the meaning of the complex forms is a compositional function of the meaning of its parts.

(b) *Morphology*. Stress-shifting suffixes are sensitive to the internal morphological structure of the words to which they attach. They attach to forms constructed by the root and pattern combination, or to forms ending with a Hebrew suffix (see fn. 5). Stress-neutral suffixes attach across the board to all nouns and adjectives to which there is no lexically specified form.

(c) *Distribution*: The distribution of stress-shifting suffixes is not entirely regular. There are nouns which do not take the plural suffix, for no apparent semantic or phonological reasons (see Schwarzwald 1991 for an extensive discussion of such nouns). Additionally, there are a few nouns which can take both suffixes, e.g., *?eser* ‘ten’ – *?esrim* ‘twenty’ – *?asarot* ‘decades’, and *yom* ‘day’ – *yamim* ‘days’ – *yemot-* ‘times of’ (Schwarzwald 1991: 588). Stress-neutral suffixation, on the other hand, is fully productive. The plural suffixes can be affixed to any count noun, regardless of its phonological or morphological forms.⁷ Finally, while the choice of the plural suffix is not predictable when the suffix is stress-attracting, it is fully predictable when the suffix is stress-neutral: nouns ending with *-a* take the *-ot* suffix (*viola* – *violot* ‘viola’, *?ameba*

⁷ Schwarzwald’s list of nouns which do not pluralize includes some non-core nouns as well, including professional areas of studies such as *filologya* ‘philology’, *geometrya* ‘geometry’, *?akustika* ‘akustics’. I disagree with her judgments here. Such nouns can be pluralized in appropriate contexts.

– *ʔamebot* ‘ameba’, *pitsa* – *pitsot* ‘pizza’), all other nouns take the *-im* suffix (*avokado* – *avokadoim* ‘avocados’, *kontsert* – *kontsertim* ‘concert’, *kartiv* – *kartivim* ‘popsicle’, *guru* – *guruim* ‘guru’).⁸ I am aware of one exception to this generalization: when a family name ends with *-a*, the plural (denoting the members of the family) is formed by the *-im* suffix rather than the *-ot* (e.g., *ha-moria-im* ‘the Moria family’, **ha-moriyot*).

4. Default Plural Marker

A different aspect of plural formation in MH has been investigated by Berent, Pinker and Shimron (1999). They raise the question of whether MH has a default plural marker, that is, regular inflection that applies by the ‘elsewhere condition’ to any target that fails to trigger a more specific process (in the sense of Kiparsky 1973). Berent et. al. hypothesize that although plural formation is irregular, native speakers use the *-im* suffix as the default plural marker for all masculine-sounding words outside of the canonical root-and-pattern morphology, e.g., borrowings, acronyms and names. In a series of experiments, they presented native speakers with masculine sounding non-words that are highly dissimilar from existing Hebrew words, as well as masculine sounding words identical in form to existing Hebrew words, but used as borrowings or names (e.g., the word *kir* ‘wall’) was presented as a French drink or a family name). The subjects were asked to provide the plural forms for these invented words. Subjects invariably chose the *-im* suffix, although many of the homonymous Hebrew words are pluralized by *-ot*. Hence Berent et. al. conclude that *-im* indeed functions as a general default plural marker in MH.

What has gone unnoticed so far is that the Berent et. al. study is directly related to the dual behavior of plural suffixation described above, in that the class of words that takes the default plural marker is precisely the class that does not allow stress shift in plural formation. The experiments in the Berent et. al. study were conducted in writing, hence the stress pattern of the target words was not documented (Hebrew orthography does not encode stress).⁹ However, had they done the experiment orally, it would become clear that the default suffix does not attract stress. In other words, the plural marker, when functioning as a default marker, is stressless. This correlation calls for an explanation.

5. Suggested Analysis

One possible explanation is to assume that Hebrew has acquired a number of stressless suffixes. Hebrew has indeed borrowed a few stressless derivational suffixes, e.g., *-nik* (*kibutsnik* – *kibutsnikim* ‘a Kibutz member’), and the diminutive *-çik* (*katañçik* ‘very small, minute’). These suffixes, though stressless, are not stress-neutral: they require the preceding syllable to be stressed. The suffixes analyzed in this paper, in contrast, are

⁸ As was pointed out to me by Edit Doron, the plural form of nouns ending with *-i* is *-im* rather than the expected *-iim* (e.g., *sini* – *sinim* ‘Chinese persons’). In adjectives, however, plural forms often retain both vowels: *siniim* ‘Chinese (adj)’.

⁹ Berent et. al. do mention that default suffixation is stressless. However, their experiments were designed to examine the choice of the plural marker (*-im* or *-ot*), and did not take stress into consideration.

both stressless and stress-neutral. If we assume that these suffixes are borrowed as well, it would be difficult to explain why all these suffixes have homophonous stressed counterparts. It also fails to explain the semantic and distributional correlates of the two types of suffixation.

The approach I wish to pursue here is that Hebrew has acquired a new way of combining a suffix to a base, that is, that Hebrew acquired a different boundary, or a new level for suffixation. This approach accounts straightforwardly for the cluster of properties associated with each type of suffixation, and for the development of default forms as well.

As has long been observed (e.g., by Sapir 1925¹⁰), suffixes attach to bases in two different ways. These have been formalized in terms of two different boundaries: + and # (Chomsky & Halle 1968, Aronoff 1976), which correspond to two different levels of affixation: stem level and word level respectively (Kiparsky 1982, 2000, Aronoff & Sridhar 1987).¹¹ Stem level suffixes typically trigger and may undergo phonological changes, may cause stress shift in the base, are less coherent semantically and less productive. Word level suffixes cause no phonological changes to the base, they are stress neutral, and are much more regular, both semantically and distributionally.

Hebrew nominal suffixes (both inflectional and derivational), are basically stem level suffixes. They attract stress, and may alter the phonological structure of the base. They are also semantically less coherent, and their distribution is not completely regular. A few suffixes, however, behave like word level suffixes when attached to non-canonical bases: they are stress-neutral, do not cause any phonological changes to the base, are semantically coherent and their distribution is completely regular. In other words, the dual behavior of certain suffixes can be captured in terms of different levels of suffixation: these suffixes behave as stem-level suffixes when attached to bases with canonical roots, and as word-level suffixes when attached to non-canonical bases.¹² The cluster of properties characterizing each type of suffixation follow straightforwardly from the assumption that they apply at different morphological levels, as summarized in table 4:

¹⁰ Sapir (1925, fn. 6) attributes to L. Bloomfield the observation that "the agentive *-er* contrasts with the comparative *-er*, which allows the adjective to keep its radical form in *-ŋg-* (e.g., *long* with *-ŋ*: *longer* with *-ŋg-*)." Consequently, Sapir analyzes the agentive *-er* as an affix that attaches to a word, while the comparative *-er* is affixed to stems. I thank Mark Aronoff for bringing this reference to my attention.

¹¹ Kiparsky maintains that the levels are ordered with respect to each other, while Aronoff & Sridhar explicitly argue against level ordering. The analysis presented here does not have any bearings on the issue.

¹² Hebrew is not unique in having homonymous word vs. stem level suffixes. Aronoff (1976) and Aronoff & Sridhar (1987) discuss such suffixes in English and Kannada, showing that the morphological differences are accompanied by the expected semantic and distributional differences.

Stem Level Suffixes (+boundary)	Word Level Suffixes (#boundary)
<ul style="list-style-type: none"> • Trigger phonological changes to the base (<i>tof</i> – <i>tupim</i> ‘drum’) • Attract stress (<i>gir</i> – <i>girim</i> ‘chalk’) • Less coherent semantically (<i>jerutim</i> ‘service+pl., =WC’) • Less productive: do not apply to some words (<i>behemot</i> ‘hippopotamus’) • Irregular distribution: choice of plural suffix cannot be determined by the form or gender of the singular. 	<ul style="list-style-type: none"> • Cause no phonological changes to the base (<i>avokado</i> – <i>avokadoim</i>) • Stress neutral: (<i>gir</i> – <i>girim</i> ‘gear’) • Semantically coherent • Fully productive: can attach to words of any phonological structure, even words ending with a vowel (<i>homo</i> – <i>homoim</i> ‘homosexual’) • Regular distribution: determined by the form of the singular: words ending with <i>-a</i> take the <i>-ot</i> suffix. All other words take the <i>-im</i> suffix.

Table 4: Two different types of suffixation in Modern Hebrew

This analysis has the following advantages: first, the default nature of these suffixes is accounted for. Word level affixes are much more regular and productive than stem level affixes, in that they apply across the board to an entire class of words. Hence only word level affixes can function as default marker in this case. Second, it explains the fact that all stressless suffixes have stressed counterparts: the suffixes themselves are not new, only the way they combine with the bases. Third, it accounts for the specific nature of the bases which take stem-level suffixes. These words lie outside the canonical word-formation processes of the language, and hence fail to trigger any more specific affixational rules.

According to this analysis, the diachronic change that Hebrew is undergoing is the activation of a new level for suffixation, the word level. In earlier stages of Hebrew, all nominal suffixation processes took place at stem level. In Modern Hebrew, suffixation takes place at two levels, depending on the nature of the base and the nature of the suffix. The core lexicon still exhibits the same pattern found in earlier stages of Hebrew: suffixation is restricted to stem level. The non-core lexicon, in contrast, introduces the change: some suffixation processes take place at stem level, while others occur at word level. The word level suffixes are the most productive and regular suffixes in the language: the plural and feminine inflectional suffixes, and the *-i* and *-iyut* derivational suffixes. All other suffixes are stem level¹³.

¹³ The stem level suffixes include all derivational suffixes, as well as two inflectional suffixes: the masculine plural construct state suffix *-ei*, and the possessive suffixes. These suffixes, though inflectional, are non-obligatory, since they have synthetic paraphrases, and in fact they become quite rare in current language use.

These diachronic changes are quite recent. In earlier stages of the language, plural suffixes were always stress-attracting, even when attached to borrowed words, e.g.: *teʔatron* – *teʔatraʔot* (‘theatre’, of Greek origin), *maʃkanta* – *maʃkantaʔot* (‘mortgage’ of Aramaic origin), *ʔadrixal* – *ʔadrixalim* (‘architect’, of Akkadian origin, via Aramaic), and even the more recent *ʔuniversita* – *ʔuniversitaʔot* (‘university’).

<p><u>Stem Level :</u> All nominal suffixation (inflectional and derivational)</p>	<p><u>Stem Level :</u> Core Lexicon – All nominal suffixation</p>	<p><u>Stem Level :</u> Non-core lexicon Non-regular (mainly derivational) suffixes</p>
<p><u>Word Level:</u> Non-core lexicon: Regular (default) suffixes: inflection (pl., fem.), derivation (<i>-i</i>, <i>-iyut</i>).</p>		
<p>Earlier stages of Hebrew</p>	<p>Recent Modern Hebrew</p>	

Table 5: Levels of suffixation in Hebrew

The bifurcation of suffixation in MH results in another change in its morphological system: the emergence of two distinct gender systems in the language. In the core lexicon, gender assignment is unpredictable, and therefore has to be assigned lexically. In addition, gender is not an inflectional class, as there are no inflectional paradigms in the gender system. In the non-core lexicon gender assignment is completely predictable by the phonological form of the word (as has been pointed out by Schwarzwald 2002), and gender is an inflectional class, since the form of the plural is predictable from the phonological form of the singular: if the singular ends in *-a*, it is feminine, and the plural suffix is *#ot*; otherwise, it is masculine, with *#im*. (e.g. *viola* is feminine, but *çelo* is masculine; plural *violot* and *çeloim*). Hence the novel development in Hebrew – the activation of the word level – results in two significant changes in Hebrew word formation: the development of default inflectional markers and a split in the inflectional category of gender.

The model suggested above makes the following predictions:

1. If a word takes a word-level suffix it is a non-canonical word.
2. If a dual-behavior suffix exhibits stem-level behavior, then the base it attaches to is a canonical word.

To the best of my knowledge, there are no counterexamples to the first prediction. Only non-canonical words take word-level suffixes. As for the second prediction, there are two types of possible counterexamples. First, old borrowings take only stem level suffixes. As pointed out above, word-level suffixation is a new phenomenon in the language. In that respect, old borrowings behave as canonical words. Thus the suffixation pattern of a foreign word is an indicator of the point in

which it entered the language: if a foreign word exhibits only stem level suffixation, it has entered the language in earlier stages.¹⁴

The second type of counterexamples consists of non-canonical words which share the vocalic pattern of canonical words. Typically, these are disyllabic stress-final words, with 3-5 consonants. Thus, *mankal* ('C.E.O.' acronym), *salat* ('salad', borrowing), *smartaf* ('babysitter', blend) are perceived by speakers as having a canonical pattern (on a par with the canonical *malʔax* 'angel', *tabax* 'cook' and *klavlav* 'a little dog/puppy'), and consequently are restricted by some speakers to stem-level suffixation.¹⁵ These two types of counterexamples indicate that the diachronic change Hebrew is undergoing is still very dynamic, being shaped by forces such as the relative youth of a word in the language, and the resemblance of newly formed or borrowed words to canonical forms.

6. Against a Phonological Analysis

Bat-El (1993) and Becker (2003) offer a phonological account of the stress behavior of suffixed forms in MH. According to Bat-El (1993), Hebrew has a class of words that are inherently marked for stress ('accented formatives'), and consequently do not allow the stress to shift to the affixes. Thus, in *traktor* – *traktorim* ('tractor'), stress does not shift to the plural suffix since the base is lexically accented. In order to account for the stress shift in some suffixes (such as *-an*, as in *traktor^{an}* 'tractor driver'), she further distinguished between cyclic and non-cyclic affixes. Cyclic suffixes always precede non-cyclic suffixes, and they trigger the Stress Erasure Convention; that is, cyclic suffixes remove any metrical structure previously assigned. Suffixes such as *-an* are cyclic, hence they remove the lexically assigned accent of the base. In contrast, the non-cyclic plural suffixes respect previously assigned metrical structure.

Bat-El's analysis is similar to the one suggested here in assuming different classes of bases (formatives) and different classes of suffixes. Stress assignment is the result of attaching a specific type of suffix to a specific base. It differs from the analysis suggested here in that the bases and the suffixes are categorized only according to their phonological structure, without making reference to their morphological status.

Becker (2003) further suggests that all the items that have no underlying stress (which he refers to as 'words with mobile stress') are subject to a disyllabic maximum constraint. That is, stress shift to the suffix is restricted to words whose roots are maximally disyllabic. Thus, *psanter* ('piano') has mobile stress (*pasnterim*), since it is disyllabic, while *diktator* ('dictator') has fixed stress (*diktatorim*) since it is tri-syllabic. This analysis faces some empirical problems, in that there are a few tri-syllabic words with mobile stress in Hebrew, such as *livyatan* – *livyatanim* ('whale'), *pilegef* – *pilag^{sim}* ('concubine'), *'akavif* – *'akavif^{sim}* ('spider'), *tsiporen* – *tsipornim* ('carnations'), *taklitor* – *taklitorim* ('CD'), *kadureglan* – *kadureglanim* ('a soccer

¹⁴ When, precisely, the change took place is unclear. However, I think it is reasonable to assume that this diachronic change is closely related to the revival of Hebrew as a spoken language, in the end of the 19th century and the first decades of the 20th century.

¹⁵ Blends ending with *-or* seem to constitute another type of counterexamples. For most speakers, they are pluralized at stem level, though they do not have a canonical vocalic pattern: *migdator* – *migdatorim* ('lighthouse'), *taklitor* – *taklitorim* ('CD'). I have no explanation for that.

player’). In addition, the old loans mentioned above exhibit mobile stress, whether or not their root is maximally disyllabic.

The main problem, however, for a strict phonological analysis, is its failure to account for the specific nature of the class of words with fixed stress (Bat-El’s ‘accented formatives’). Under Bat-El’s analysis, whether a word has fixed or mobile stress is an idiosyncratic property of each word. In Becker’s analysis, this falls out from its syllabic structure. Indeed many foreign words and acronyms have stems consisting of more than two syllables, but there are also numerous monosyllabic or disyllabic borrowings in the language. Whether a mono/disyllabic word has fixed or mobile stress must be stipulated in Becker’s model.

The behavior of nouns used as names is also incompatible with a strict phonological account, as pointed out by Berent et. al. (1999: 32). Names having phonological forms identical to existing canonical nouns, nonetheless have different plural forms (e.g., *barak* – *brakim* ‘lightening’ vs. *Barakim* ‘The Barak family’). This difference cannot be explained without referring to the morphological make-up of these forms, specifically to ‘rootlessness’ of names.

Finally, a phonological analysis cannot account for the semantic and distributional correlates of the two types of suffixation. These arguments strengthen the conclusion reached by Berent et. al., namely that an analysis which views suffixation as a morphological process is more explanatory and adequate than a strict phonological analysis.

7. Conclusions

The dual behavior of certain suffixes in Modern Hebrew with respect to stress-assignment has been accounted for in terms of a new morphological level for nominal suffixation in the language. This level is the site for concatenation of regular suffixes to non-canonical nominals. Irregular suffixation and suffixation of canonical nouns take place at the stem-level, which was the only level available for nominal suffixation in earlier stages of the language. This morphological change brought about two additional modifications to the system: the development of true default markers and the emergence of two distinct gender systems in the language.

Aronoff & Sridhar (1987: 19) point out that English is considered odd in having two levels of affixation, and that this oddity is often attributed to the mixed ancestry of the language – “bastard child of Germanic out of Romance”. Kannada (also discussed in Aronoff & Sridhar), a Dravidian language heavily Sanskritized, is another example of such a language. While modern Hebrew retained much of the morphological system of Biblical Hebrew, in particular the root-and-pattern non-concatenative morphology, it might be that the flux of foreign borrowings and foreign word formation processes (such as prefixation and blends) have led to a similar change in its morphological structure. If levels of affixation contribute to the morphological typology of languages, then it seems that MH is undergoing a change in its typological characterization, by adding word-level to its stem-level nominal suffixation.

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