

**Transition in Modern Hebrew Word Formation: From Discontinuous to
Linear Formation**

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The aim of this paper is to show that the tendency towards linear word formation becomes stronger in Modern Hebrew and it extends to verbs which were traditionally considered as derived discontinuously.

Root-and-Pattern combination is regarded as the most significant typological feature of word formation, especially in verbs, in all Semitic languages, including Hebrew. A discontinuous consonantal root is inserted into a discontinuous vocalic pattern, with or without further additional consonants to form a word, as in (1).

(1) *balat* “protruded, stood out”, *hivlit* “made conspicuous, stressed”, *hitbalet* “was outstanding, excelled”, *blita* “protrusion, bulge”, *baluta* “gland”, *tavlit* “relief”, *havlata* “prominence, emphasis”, *muvlat* “conspicuous, salient”, *hitbaltut* “prominence, excellence”

The consonantal root is *b-l-t* (~*v-l-t*), and in all its occurrences it has the meaning of sticking out, being noticed because of a protruding feature, whether physical or abstract. It is inserted in various patterns, verbal as in *XaXaX*, *hiXXiX*, *hitXaXeX*, and nominal as in *XXiXa*, *XaXuXa*, *taXXiX*, *muXXaX*, *hitXaXXut*, where capital X refers to a radical (consonantal root unit). The vocalic augmentation of the pattern is the dominant factor in determining the word form and inflection.

Although Root-and-Pattern formation is widespread in the Hebrew lexicon, it is not the only technique to form MH words. There are two other widespread methods of word formation (Ornan 1983; Ravid 1990; Nir 1993; Schwarzwald 2001a: 21-22, 2002: unit 4):

a. Base, non-derived stems: words that cannot be separated into any morphological components. They include many basic words, e.g. *yom* “day”, *ki* “because”, onomatopoeic words, e.g. *túk-tuk* “knock-knock”, *zamzam* “buzz”, as well as loan words, e.g. *pardes* “orchard”, *rádyo* “radio”.

b. Linear word formation - concatenation of various morphological components:¹

i. Stem-and-Affixes, either suffix, e.g. *malxuti* “royal” (*malxut* “kingdom” +*i*), *xá Omalay* “electrician” (*xá Omal* “electricity” +*ay*), or prefix, e.g. *xad-kéren* “unicorn” (*xad* “one” +*kéren* “corn”), *miyad* “immediately” (*mi* “from” +*yad* “hand”)²

ii. Word compounding, or Multi-Stem-Concatenation, e.g. *bet séfer* “school” (*báyit* “house/cns” + *séfer* “book”), *basar vadam* “human being” (*basar* “flesh” + *va* “and” + *dam* “blood”), *kfar globáli* “global village” (*kfar* “village” + *global+i/adj*), *‘al yad* “near” (*‘al* “on” + *yad* “hand”)

¹ Underlined *x* indicates orthographic <h> which is pronounced [x] in Modern Hebrew (MH), and underlined *‘* indicates orthographic <‘>, MH [‘]. Stress is marked when not on the final syllable.

² Stems can be formed in any of the ways, Base, Root-and-Pattern, or Linear derivations.

- iii. Multi-Stem-Blend, e.g. *'arpiax* “smog” (*'arafel* “fog” + *piax* “smoke”), *midreḥov* “promenade” < *midraxa* “sidewalk” + *reḥov* “street”)
- iv. Acronyms, either orthographic or phonetic, e.g. *mankal* “general manager/m (CEO)” (*menahel klali*), <*x*“k”> “parliament member” (*xaver* “member” + *kneset* “parliament”, pronounced as a word in inflection *xákim* [p], *xákit* [f]), <*m*“m”> “replacement, substitute” (*memale* “fill” + *makom* “place”, also pronounced by the letter names *Mem Mem*)

All the methods for word formation apply to nouns, adjectives, adverbs, prepositions, etc., as shown in the examples above. However, discontinuous Root-and-Pattern combination is considered the only method for verb formation. The verb system is unique in Hebrew in that a verb can take one of the *binyanim* forms which are well structured, predictable and limited in number. A verb can be formed only with the following possible vowels (the forms are presented in 3m.sg past-present-future forms):³

- 1.1 XaXaX-XoXeX-XXoX~XXaX (*kalat-kolet-yiklot* “absorb”, *lamad-lomed-yilmad* “study”)
- 2.1 niXXaX-niXXaX-yiXaXeX (*nigmar-nigmar-yigamer* “end”)
- 3.1 XiXeX-meXaXeX-yeXaCeX (*šilem-mešalem-yešalem* “pay”)
- 4.1 XuXaX-meXuXaX-yeXuXaX (*butal-mevutal-yevutal* “be cancelled”)
- 5.1 hitXaXeX-mitXaXeX-yitXaXeX (*hitbašel-mitbašel-yitbašel* “get cooked”)
- 6.1 hiXXiX-maXXiX-yaXXiX (*hikšiv-makšiv-yakšiv* “listen”)
- 7.1 huXXaX-muXXaX-yuXXaX (*hustar-mustar-yustar* “be hidden”)
- 8.1 XoXeX-meXoXeX-yeXoXeX (*roken-meroken-yeroken* “empty”)
- 9.1 hitXoXeX-mitXoXeX-yitXoXeX (*hitrocec-mitroced-yitrocec* “run around”)

The first seven verbal patterns are *pa'al*, *nif'al*, *pi'el*, *pu'al*, *hitpa'el*, *hif'il*, and *huf'al*. The last two are typical of roots with final identical radicals (traditionally called *binyan polel* and *hitpolel*), but the example in 8 shows that they are not necessarily so (*r-k-n*). I used the X symbol instead of C, because more than one consonant may occur in these consonantal slots, although one consonant is the default. For example, in *hišpric* “splashed” in *hif'il* (6), the consonants *špr* stand for the first two X's, in *tilgref* “telegraphed” in *pi'el* (3), *lgr* stand for the second X, in *gišpenk* “approved, put the seal on” in *pi'el* (3) *šp* stand for the second X and *nk* for the final X, and in *šnorer* in *polel* (8) *šn* stand for the first X.⁴

A verb cannot be formed, for instance, by any other vowel combination other than those present in 1-9. Thus **XaXiX*, **XiXuX*, **maXXeX*, cannot become verbs, though they are perfectly good patterns for nouns or adjectives, e.g. *baxir* “senior”, *pakid* “clerk”, *sipur* “story”, *išur* “confirmation”, *masmer* “(carpentry) nail”, *mašber* “crisis”.

The common claim is that consonants are extracted from other words to and then inserted into a *binyan* to form a verb. Nevertheless, in some cases, nouns and verbs are introduced

³ A few bi-consonantal roots take a slightly different vocalic form, which is related morpho-phonemically in most cases to these vowel structures.

⁴ Detailed reference to the *binyanim* structures appear in Schwarzwald (1996; 2002, units 9-10).

linearly to MH lexicon though they seem to belong to the Root-and-Pattern formation as if they were inserted into a particular pattern. The following examples (2-4) show linear formation in nouns.

- (2) *ḥbrit* “circumcision; the ceremony on the eighth day of a newly born boy” +*a* > *brita* “party for a newborn girl” (cf. *blita*; *šlita* “control”; *XXiXa*)
- (3) *ḥta*+ *mexir* “price” > *tamxir* “cost accounting” (cf. *taklit* “record”, *talmid* “student”; *taXXiX*)
- (4) *ḥmi*+ *kod* “code” > *mikud* “area code” (cf. *mitun* “recession”, *mimun* “financing”; *XiXuX*)

The linear addition of +*a* to a noun like *brit* in (2) gives *brita*. This new noun looks like the pattern *XXiXa*, like *blita* “protrusion, bulge”, mentioned in (1), however, there are no other words related to **b-r-t*. The noun *mexir* in (3) served as the base for *tamxir*, which in turn seems like the pattern *taXXiX* of nouns such as *taklit* “record” and *talmid* “student” (roots *k-l-t* and *l-m-d*), but there is no root **m-x-r*. The word *mikud* was actually formed from *kod* with *mi*+ (of *mispar* “number”?) and formed as *CiCuC*, exactly like other words *mitun* “recession”, *mimun* “financing” in the *XiXuX* pattern (roots *m-t-n* and *m-m-n*). This word *mikud* is homonymous with *mikud* “focus” (root *m-k-d* + *XiXuX*), where the root was extracted from *moked* “focus” that had originally been formed from the root *y/w-k-d* with *maXXeX* pattern.

This phenomenon of linear insertion of words into a “pattern” system exists in the formation of verbs as well, in spite of its being traditionally considered as derived by solely Root-and-Pattern technique. The verbs in (5) are linearly derived directly from the nouns in (6).

- (5) *laxrop* “to sleep”, *šnorer* “mooched”, *hišpric* “splashed”, *hišvic* “bragged”, *hiflik* “smacked”, *hisnif* “sniffed”, *hiklik* “clicked”, *hitalbet* “kicked back, loafed”, *mesanđer* “making someone into an errand boy”, *hitxaver* “befriended”
- (6) *xrop* “sleep, snore”, *šnorer* “moocher”, *špric* “splash”, *švic* “showing off”, *flik* “smack”, *sniff*, *click*, *stálbet* “relaxation”, *messenger*, *xaver* “friend”⁵

The verbs in (5) retain the base structure of the noun in (6), including their consonant clusters (Bat-El 1994, Ussishkin 1999a, b),⁶ but they look exactly like regular verbs derived by root extraction and discontinuous insertion into a pattern, as the verbs in (7) that are related to other words in (8), from the roots *x-š-v*, *s-v-v*, *g-d-r*, *s-k-r-n*, and *x-r-t*.

- (7) *laxšov* “to think”, *sovev* “turned around”, *higdir* “defined”, *memasper* “number/pres”, *histakren* “was curious”, *hitxaret* “regretted”
- (8) *xేశbon* “calculation”, *sivuv* “rotation”, *gader* “fence”, *mispar* “number”, *sakran* “curious”, *xarata* “regret” (the roots *x-š-v*, *s-v-v*, *g-d-r*, *s-k-r-n*, and *x-r-t*)

Root extraction and then insertion into a pattern, as generally explained in verb formation, as in (7), does not apply therefore to the examples in (5). However, once the verbs were linearly inserted into the verb system, they are conjugated regularly as any other Root-and-Pattern

⁵ The verb *hifriz* “exaggerate” is a well recognized verb, but in colloquial MH a new homophonic verb has been formed from *freeze*: *hifriz* means also to freeze.

⁶ Other verbs are formed in *XoXeX* structure to retain the basic structure of the nouns, e.g. ‘*ot* “sign”, ‘*otet* “signaled”; *kod* “code” *koded* “encoded”, etc. (Schwarzwald, 2000; Bat-El 1994).

derived verb (Schwarzwald 2000). The examples in the left column of (9), based on (5), are parallel in their inflections to the right ones, based on (7).

(9)	<i>xarápti</i>	<i>xášávti</i>	1 st .sg, past tense
	<i>xorépet</i>	<i>xošévet</i>	f.sg, present tense
	<i>šnorárnu</i>	<i>sovávnu</i>	1 st .pl, past tense
	<i>tešnoreru</i>	<i>tesovevu</i>	2 nd .pl, future
	<i>mašvicim</i>	<i>magdirim</i>	m.pl, present
	<i>našpric</i>	<i>nagdir</i>	1 st .pl, future
	<i>hiflíku</i>	<i>higdíru</i>	3 rd .pl, past
	<i>tesanđer</i>	<i>temasper</i>	2 nd .m.sg, future
	<i>sinđerera</i>	<i>mispera</i>	3 rd .f.sg, past
	<i>mistalbetot</i>	<i>mistakrenot</i>	f.pl, present
	<i>hidtalbátnu</i>	<i>histakránⁿu</i>	1 st .pl, past
	<i>mitxavrim</i>	<i>mitxartim</i>	m.pl, present
	<i>titxavru</i>	<i>titxartu</i>	2 nd .pl, future

Various studies address the issue of the means for word formation in MH and their quantitative aspects. Studies in literary lexical innovations claim that the dominant way is Root-and-Pattern formation with no statistical evidence (Moreshet 1978; Nir 1979; Fruchtman 1994; Muchnik 1996; Ben Shahar 2000). Muchnik (2000) analyzed colloquial newly formed adjectives and found that about half of them were derived by Root-and-Pattern while the other half were mostly formed linearly by stem and suffix. Modern Adjectives are formed with +i suffix more than by Root-and-Pattern (Werner 1983), especially due to loan stems.

A few statistical analyses prove that the rate of linear formation increase in MH. Nir (1993: 143-147) examined a sample of brand names, and found that only 3.8% were Root-and-Pattern derived, 7.7% were formed by Stem-and-Prefix, 27.7% by Stem-and-Suffix, and the bulk of brand names (60.8%) were formed by Multi-Stem-Concatenation. Another recent study of food brand names (Bar-Sela 2002, n=977) proves that no new names were innovated by Root-and-Pattern, though this word formation is found among 24% of the common existing nouns that were taken for brand names. Among the real innovative brand names, the rate of Base formation was 8.2% (most of them [7.5%] loan words); Stem-and-Prefix consisted of 2.5% and Stem-and-Suffix 7.9%. As in Nir's findings, the rate of Multi-Stems was the highest (67.4%), of which 13.1% were Blends, less than one percent acronyms and the majority of brand innovated names were Compounds of two words or more in various ways (54.2%).⁷

Brand names are a special group of innovated words aimed to attract the customer with catchy and understandable message. The rate of Compounds in these groups can be accounted by this fact: the expansion of the expressions by various other words gives the customer some clues about the product they are about to buy. The obvious implication from

⁷ The results are presented here in generalized form. Bar-Sela went into details in describing each of the compounding techniques.

these findings, though, is that the rate of Root-and-Pattern formation in these names is abandoned in favor of the linear formation.

Schwarzwald (2001b) compared the rate of innovations in a Modern Hebrew dictionary (n=375) and from texts (n=84) with the distribution of all the words according to their formation in the same sources (n=792, n=441, respectively).⁸ The results are presented in Table 1.

Table 1: MH Word Innovations

Innovations	Base	Root-and-Pattern	Linear Formation			
			Stem+Affix	Compound	Blend	Acronym
Dictionary	28.3%	33.6%	20.2%	16.5%	0.3%	1.1%
Text	36.9%	23.8%	25%	9.5%	2.4%	2.4%
General distribution						
Dictionary	21.8%	48.1%	12.9%	15.4%	0.8%	1%
Text	35.6%	44%	14.3%	4.3%	1.4%	0.4%

The rate of new Root-and-Pattern formation is smaller in innovations than in the general distribution of words (33.6% and 23.8% versus 48.1% and 44%), whereas the formation of linear stem + affixes is considerably bigger (20.2% and 25% versus 12.9% and 14.3%), as are linear Compounds in texts, though less significantly (16.5% and 9.5% versus 15.4% and 4.3%). The rate of base formation is higher too in innovations (28.3% and 36.9% versus 21.8% and 35.6%), mostly due to heavy borrowings. Blend and acronyms remain insignificant word formations though there is a slight change in their distribution in texts (2.4% versus 1.4% and 0.4%). The ratio of word formation techniques in word innovations changes considerably in the dictionary: from almost 50% Root-and-Pattern words leaving each of the other formations far behind, to about 33.6% Root-and-Pattern words and closely similar Base formation (28.3%) and only slightly lower Stem-and-Affix formation (20.2%). Similar results occur in the text, where priority is given to Base formation (36.9%) while Root-and-Pattern and Stem-and-Affix show similar results (23.8% and 25%).

Azar (2001) examined a sample of the new lexical entries that were added to new dictionaries over the past thirty years as compared to the old version of Even-Shoshan Modern Hebrew dictionary (1970). He found that of the 600 words in the sample (of the letters *Aleph*, *Ayin*, *Pe* and *Qof*), 13% were old words with new meanings, 45% were Multi-Stem-Compounds, 29% were loan words (Base formation), and only 13% were genuine Hebrew word innovation by either Root-and-Pattern or Stem-and-Suffix.

The statistical evidence proves that although Root-and-Pattern formation is still productive, linear formation, by either Stem-and-Affix formation or Multi-Stem-Compounding is rapidly gaining momentum and is thus changing the traditional way linguistics today look at Hebrew word formation. Although Root-and-Pattern formation still maintains a dominant position in

⁸ The new words in the above analysis dated from the year 1900 on, in what is being considered Modern Hebrew.

verb formation and verb-related forms (participles and gerundives), many ruptures are found in verb discontinuous formation as well.

The various methods of word formation may lead to similar syllabic structure where the derivation might be obscure, and attributable either to Root-and-Pattern, Stem-and-Affix, or other derivational techniques discussed above. A priori, any of the techniques can be chosen, but in fact, there is a preference for deriving new words from existing words provided they fit the syllabic structure of Hebrew. The examples in (10) show similar word syllabic structures that belong to different word formation techniques in nouns:

- (10) a. 1. *smixut* “proximity” < *s-m-x + XXiXut*
 2. *smixut* “thickness” < *samix* “thick” + *ut*
 b. 1. *banay* “builder” < *b-n-y + XaXaX*
 2. *yamay* “sailor” < *yam* “sea” + *ay*
 c. 1. *safran* “librarian” < *s-f-r + XaXXan*
 2. *'axyan* “nephew” < *'ax* “brother” + *an*
 d. 1. *šliši* “third” < *š-l-š + XXiXi*
 2. *bsisi* “basic” < *basis* “basis” + *i*
 e. 1. *taglit* “discovery” < *g-l-y + taXXXt*
 2. *kaspit* “mercury” < *késef* “silver” + *it*
 f. 1. *kanyon* “shopping mall” < *k-n-y + XaXXon*
 2. *karxon* “iceberg” < *kérax* “ice” + *on*

The example in (10a) present homophones derived in two various ways. The other examples demonstrate that similar syllabic structures are formed through various derivations. The inflectional behavior of each paired words is identical, e.g., *smixuyot* (pl), *bana'it-yama'it* (f), *safranit*, *safranim*-*'axyanit*, *'axyanim* (f.sg, m.pl), etc.

Like the parallel verbs in (9), similar verbs can be derived from different roots, as in (11):

- (11) a. *more* “teacher” < *y/w-r-y + maXXX* (participle)
 “rebellious” < *m-r-y + XoXeX* (participle)
 b. *tiblu* “they seasoned” < *t-b-l + XiXeX* (past tense)
 “you/pl will decay” < *n-b-l + XaXaX* (future tense)
 c. *hušav* “he was seated” < *y/w-š-b + huXXaX*
 “he was returned” < *š-w-b + huXXaX*

Examples (11a) is a participle form used as a noun, and examples (11b-c) are conjugated verbs. Their ambiguity stems from the different roots. The meanings of the words are either context- or register-dependent; there is no way of knowing, a-priori, the meaning when presented out of context. The result is that we have Hebrew *CoCe* participle structures as well as inflected *tiCCu* and *huCaC* verb structures.

The creation of new verbs through linear insertion, as presented in examples 5 above, although still marginal in MH, shows that the morphological system is undergoing a change. Due to the massive borrowing in MH, adjustment of loan words into the morphological system is made through Stem-and-Suffix linear formation rather than by Root-and-Pattern. It is conspicuous in nouns and adjectives and it gradually penetrates the verb system, though thus far it has no effect on the *binyanim* system. Only future generations might see the change in there.

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