OLD FORMS, NEW FUNCTIONS: QUADRILITERAL ROOT PATTERNS AS SOURCES OF VERBAL MEANING

Vera Agranovsky
The Hebrew University of Jerusalem

ABSTRACT

This paper describes a process whereby morphological patterns that, in premodern Hebrew, were not associated with a particular semantic profile, or were only partly associated with such a profile, developed a particular meaning in Modern Hebrew. This process is exemplified by certain types of quadriliteral roots formed in the Hebrew verbal system.

Of eight quadriliteral root patterns productive in Modern Hebrew, three developed meanings of their own: the pilpel pattern, which expresses a series of short, atomic events; the piʿlel pattern, which describes a reduced or attenuated event, and the šifʿel pattern, which conveys a restitutive or repetitive meaning, or increase on scale. The pilpel pattern became associated with its meaning already in Mishnaic Hebrew, and in Modern Hebrew the association became nearly exclusive, whereas the other two patterns developed their typical meanings only in Modern Hebrew itself.

This research shows that a quadriliteral root-pattern develops a particular semantic profile only if it utilizes the derivational mechanism of direct root-expansion in the verbal system without the mediation of another lexical item. Moreover, individual verbs coined in the pattern tend to be associated with that meaning if they are derived in this manner. Pilpel verbs can convey the pattern’s typical meaning even if they are derived by onomatopoeia or with the mediation of noun, but only if the parent nominal form is biliteral.

The research also traced the development of patterns’ semantic profiles over time. It was found that this development was conspicuously influenced by the substrate and contact languages of Modern Hebrew, and that factors of reanalysis and analogy were also at play.

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1. INTRODUCTION AND METHODOLOGY

This paper deals with a process in Modern Hebrew (MH), whereby morphological patterns that were not associated with particular semantic profiles in earlier periods of the language developed particular meanings in the modern language. The test case examined here is quadriliteral root patterns that existed in the early layers of Hebrew but were not associated, or were only weakly associated, with a specific meaning, but which in MH, the study found, acquired typical meanings that are evident in nearly all cases, subject to certain derivational constraints. The paper examines the constraints on the development of the pattern’s particular meaning, and on the association of this meaning with individual verbs coined in the pattern. It also explores the process whereby the inherited patterns acquired new functions based on new needs, examining the factors that motivated and influenced this development, especially the impact of the substrate languages.

This study was conducted from the perspective of diachronic productivity. Studies of this sort measure linguistic productivity over time, by counting the number of attested neologisms over a certain period. Such a study based on reliable historical dictionaries. In our case all verbs affiliated with the groups under investigation, from all periods of Hebrew, were collected. The main source was the Even-Shoshan Dictionary (2010), and this was supplemented by specialized dictionaries: R. Sappan, Dictionary of Israeli Slang (1966); D. Ben-Amotz and N. Ben-Yehuda, The World Dictionary of Hebrew Slang (1972); N. Stern, Dictionary of Verbs (1994); R. Rosenthal, Dictionary of Israeli Slang (2006); U. Ornan, A Dictionary of Forgotten Words (2003). Verb roots were assigned to layers based on the Even-Shoshan dictionary and on Y. Kenaani’s Thesaurus of the Hebrew Language (1960–1989). Data on non-biblical verbs were reviewed by Ma’agarim: The Historical Dictionary Project of the Academy of the Hebrew Language and corrected when it was necessary. Analyzing both modern and the pre-modern language products allowed not only to identify productive mechanisms in MH but also to compare them to the mechanisms used in previous periods.

The description of the derivational mechanisms in MH is based on an analysis of the relevant roots coined in MH, and especially of those that gained currency in the language. Due to the unique history of MH, in the course of

2. M. Haspelmath and A. D. Sims, Understanding Morphology (London: Hodder Education, 2010).
its development, and especially during the Revival Period, many forms were coined ad hoc and did not take root in the language. In order to trace productive mechanisms in MH, this research focused on words that were created and also used in the language. Of course, the analysis of the words created but not used also contribute to the understanding of the productive mechanisms when dealing with this group separately. To describe the usage of verbs coined during the MH period, as well as the development within MH, the following databases were used: Ma’agarim; The Responsa Project of Bar-Ilan University; The Historic Jewish Press Project of the National Library of Israel and Tel Aviv University; Project Ben-Yehuda – A Digital Library of Hebrew Literature. Contemporary Hebrew data was sourced from the Hebrew Web Corpus heTenTen, a Sketch Engine corpus compiled in 2014 from 20,000 websites and where necessary using Google Search.

Although this study deals with the roots, it is also important to mention the verbs patterns (binyanim) in which the roots under the investigation can appear. Hebrew quadrilateral roots are limited to three verbal templates: piʿel, puʿal, and hitpaʿel. The main distinction between these templates is one of voice: they generally convey the active, passive and middle voice, respectively. For the purposes of this study, which focuses on the semantics

3. Quadrilateral roots are confined to these templates because only they provide slots for four consonants. When a triliteral root, such as d-b-r ‘speak’ is inserted in them, its middle consonant is doubled: dib-ber, although in MH the gemination is no longer discernable in pronunciation. This template thus allows the insertion of a quadrilateral root, without gemination, e.g., dif-def, mis-per. On this see, e.g., S. Ariel, “The System of Stem-Forms in Colloquial Israeli Hebrew,” Transactions of the Philological Society (1971), pp. 192–271; Y. Yannay, “מעילים מזרחיים ומעילים מבית דבר” (Multiradical Roots in the Hebrew Language), Lĕšonēnu 38 (1974); U. Ornan, “על יצירת שורשים חדשים ועל מילים מחודשות” (On Creating New Roots and on a Few Renewed Words), Lĕšonēnu La-am 26/9 (1976); H. Rosen, Contemporary Hebrew (The Hague: Mouton de Gruyter, 1977); S. Bolozky, “Word Formation Strategies in the Modern Hebrew verb system: Denominative Verbs,” Afroasiatic Linguistics 5/3 (1978), pp. 111–138; R. Nir, “על תהליכים של יצירת שורשים חדשים” (On the Processes of Generating New Roots in Contemporary Hebrew), in Studies in Ancient and Modern Hebrew in Honour of M.Z. Kaddari (ed. S. Sharvit, Ramat-Gan: Bar-Ilan University, 1999), pp. 367–373; J. Junger, Predicate Formation in the Verbal System of Modern Hebrew (De Gruyter Mouton, Dordrecht: Foris, 1987); D. Ravid, “Internal Structure Constraints on New-Word Formation Devices in Modern Hebrew,” Folia Linguistica 24/3–4 (1990), pp. 298–347; T. Notarius, “Multiliteral Roots,” in Encyclopedia of Hebrew Language and Linguistics (ed. G. Khan; Brill, 2013); O. Schwarzwal, “Syllable Structure, Alternations and Verb Complexity: The Modern Hebrew Verb Patterns Reexamined,” in Israel Oriental Studies XVI: Studies in Modern Semitic Languages (ed. S. Izre’el, & S. Raz; Leiden: Brill, 1996), pp. 95–112; O. Schwarzwal, “Innovative Elements in Newly-Formed Hebrew Four-Consonantal Verbal Roots,” in Word-Formation Across Languages (ed. L. Körtvélyessy, P. Štekauer, & V. Salvador, Cambridge: Cambridge Scholars Publishing, 2016), pp. 312–335.
of the quadriliteral root patterns, this distinction is not essential, and the pi’el form will be taken to represent all the forms of a given quadriliteral root. Verbs will be presented in other templates only if no pi’el form exists. For convenience, I use the term “verb” to mean “a verbal root in which at least one verb has been coined.”

The paper is structured as follows. The next part, Section 2, presents the quadriliteral root patterns in MH. Section 3 deals with patterns that developed a particular meaning in MH. Section 4 addresses constraints on the development of this particular meaning and section 5 presents the constraints on the derivation of verbs associated with it. Section 6 describes the development of the patterns’ meanings and the factors that influenced this development. The seventh and final section summarizes the findings of the study.

2. QUADRILITERAL PATTERNS IN MODERN HEBREW

One of the conspicuous expressions of productivity in the verbal system of MH is the emergence of numerous quadriliteral roots, used mainly to form verbs and verbal nouns. Some of these roots consist of four different consonants (C₁C₂C₃C₄), and thus do not exhibit a particular pattern, such as the root ḥ-š-m-l, as in the verb ḥišmel ‘electrify’ derived from the noun ḥašmal ‘electricity’, and the root d-q-l-m, as in the verb diqlem ‘recite, declaim’ borrowed from European languages. Others are formed by expanding a biliteral or triliteral root in a particular way, resulting in a pattern.⁴

In some cases, the expansion involves reduplication, producing the patterns pi’el (C₁C₂C₃C₃) and pilpel (C₁C₂C₁C₂). For example, the biliteral stem of the noun daf ‘page’ was reduplicated to form the verb difdef ‘turn’.

⁴ The academic literature debates whether some of these patterns are roots or verbal templates (binyanim). See e.g., A. Even-Shoshan, "בניין שפעל בלשון ימינו" (Binyan šifʿel in Contemporary Hebrew), in Veʾim Bigvurot: Fourscore Years: A Tribute to Rubin and Hannah Mass on Their Eightieth Birthdays (ed. A. Even-Shoshan et al.; Jerusalem: Yedidim, 1974), pp. 23–31; A. Even-Shoshan, "魆נש וכשש-ששנש בלשון ימינו " (New-Old Binyanim in Contemporary Hebrew), in The Book of Sivan in Memory of Shalom Sivan, (ed. A. Even-Shoshan et al.; Jerusalem: Kiryat Sefer, 1979), pp. 93–103; U. Ornan, "On Creating New Roots," Inšifḥeš, חמשה: נושאים של המילה וה_charset למות למות (The Final Word: TheMechanism of Hebrew Word Generation), (Haifa: Haifa University Press, 2003), pp. 103–126; G. Goldenberg, "של שוף, בניין שפעל בלשון (On Roots, Binyanim and šifʿel), Lĕšonēnu 58/3 (1995), 267–272; O. Schwarzwald and E. Neradim, "과학 של שפעל בערבית (Hebrew šafʿel), Lĕšonēnu 58/2 (1995), 142–152; O. Schwarzwald, “Innovative Elements in Newly-Formed Hebrew Four-Consonantal Verbal Roots.” The present article uses the term “root pattern” without addressing the question of its linguistic or cognitive status.
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pages’, with the quadrilateral root d-p-d-p in the pilpel pattern, and the trilateral root of the verb såhaq ‘laugh’ was expanded to form the verb sihqeq ‘titter, chuckle’, with the quadrilateral root s-h-q-q in the pi’lel pattern. Alternatively, the root can also be expanded by affixation, specifically by adding one of the consonants t, m, ʾ or n, which form part of the nominal patterns in Hebrew, or by adding the consonant š, which forms part of the verbal pattern (binyan) in other Semitic languages. Prefixation, adding the consonants t, m, ʾ or š before a trilateral root, produces the patterns tifʿel (tCCC), as in tigber ‘reinforce’; mifʿel (mCCC), as in misper ‘number (v.)’; ʾifʿel (ʾCCC), as in ʾivhen ‘diagnose’ and šifʿel (šCCC), as in šidreg ‘upgrade’. Suffixation, adding the consonants n and t after the trilateral root, creates the patterns piʿlen (CCCn), as in digmen ‘model’ and piʿlet (CCCt), as in ʿivret ‘render into Hebrew’. Except for the last two, all these patterns are inherited from the previous stages of Hebrew.

3. QUADRILITERAL PATTERNS THAT DEVELOPED A PARTICULAR MEANING IN MODERN HEBREW

Of the eight patterns listed above, only three – pilpel, piʿlel and šifʿel – developed a particular semantic function, i.e., a specific meaning that characterizes the verbs derived in them as long as certain derivational constraints allow this.

Pilpel: Verbs in this pattern have been examined in the literature from a synchronic perspective in studies of MH, or from a broad perspective considering all periods of Hebrew together. They were characterized either as lacking any specific semantic function, or as expressing various kinds of multiplicity. My previous research, conducted from a perspective of diachronic productivity, characterized the product of this pattern in MH as

5. O. Bat-El, “Consonant Identity and Consonantal Copy: The Segmental and Prosodic Structure of Hebrew Reduplication,” *Linguistic Inquiry* 37/2 (2006), 179 – 210.
6. Y. Yannay, “Multiradical Roots,” A. Ussishkin, “Root – and Pattern Morphology without Roots and Patterns,” *Proceedings of the North-Eastern Linguistic Society (NELS) 30* (1999), pp. 655–670; Y. Tobin, “Trying to ‘Make Sense’ Out of Phonological Reduplication in Hebrew,” in *Proceedings of LP 2000* (ed. B. Palek, and O. Fujimura, 2001), pp. 227–260; Y. Greenberg, “Event Internal Pluractionality in Modern Hebrew: A Semantic Analysis of One Verbal Reduplication Pattern,” *Brill’s Annual of Afroasiatic Languages and Linguistics* 2 (2010), pp. 119–164.
expressing the multiplicative-semelfactive aspect. New verbs coined in the productive *pilpel* pattern, such as *hinhen* ‘nod’ and *difdef* ‘turn pages’, describe a series of short, consecutive atomic events, such as repeated nods of the head, as in *he nodded for 30 seconds* (multiplicative aspect), and most of them can also refer to a single event in such a series, as in *he nodded once/twice* (semelfactive aspect). These verbs usually describe movement or sound composed of rapidly repeated pulses.

**Pi’lel:** The reduplicative *pi’lel* pattern can produce a diminutive effect, as exemplified by *ṣixeq* ‘titter’, *ʿiqṣeq* ‘prickle, itch’, *diqrer* ‘prickle’. These verbs generally refer to a sound or a physical sensation. Some of them are derived from multiplicative-semelfactive verbs inherited from premodern Hebrew that do not appear in the *pilpel* pattern, e.g., *siḥqeq* ‘titter’, derived...
from *ṣaḥaqq* ‘laugh’, *qifṣeṣ* ‘hop, skip’, derived from *qaṣaṣ* ‘jump’, and *liḥšeṣ* ‘made small whispering sounds’, from *laḥaṣ* ‘whisper’. These verbs preserve the aspectual meaning of the original verb and add a diminutive meaning.

Šfäl: New verbs coined in the šifʿel pattern express the restitutive or repetitive meaning, namely redoing, as exemplified by šiḥzer ‘recreate, reenact’ and šixtev ‘rewrite’, and in some cases the meaning of increase on a scale, such as šidreg ‘upgrade’, šinmex ‘downgrade’.

4. CONSTRAINTS ON THE DEVELOPMENT OF THE PATTERN’S PARTICULAR MEANING

A necessary condition for a pattern to acquire a particular meaning has to do with the method of derivation, i.e., the manner in which new verbal roots are coined. New roots can arise in three different ways: based on an existing word; through the direct expansion of an existing root in the verbal system; or through onomatopoeia. Verbal roots created according to the first method are generally denominative, i.e., derived from nouns, e.g., the verb *misper* ‘number’ from the noun *mispar* ‘number’ or the verb *tifqed* ‘function’ from the noun *tafqid* ‘role, position’. In affixation patterns, the consonant of the

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10. A. Even-Shoshan, “Binyan šifʿel.”

11. On the ways of deriving quadrilateral roots, see *inter alia*: U. Ornan, “On Creating New Roots,” U. Ornan, *The Final Word*, pp. 77–101; U. Ornan, (Ways of Creating New Words), in *Hebrew Language in Development and Renovation* (Jerusalem: The Israel Academy of Sciences and Humanities, 1996), pp. 113–116; A. Even-Shoshan, “Binyan Šifʿel,” A. Even-Shoshan, “New-Old Binyanim,” Y. Yannay, “Multiradical Roots,” S. Bolozky, “Word Formation Strategies: Denominative Verbs,” M. Ephratt, “The Root-Pattern Array – The Main Tool of Hebrew Word Formation,” PhD dissertation (Hebrew University of Jerusalem, 1985); T. Sasaki (Sadan), U. Ornan, (The Classification of Secondary Roots in Modern Hebrew), in *Studies in Hebrew and Jewish Languages Presented to Shelomo Morag* (ed. M. Bar-Asher, Jerusalem: The Hebrew University and The Bialik Institute, 1996), pp. 295–304; T. Sasaki (Sadan), “Verb Formation in Modern Hebrew,” (PhD dissertation, The Hebrew University of Jerusalem, 2000); T. Sasaki (Sadan), “Roots in Modern Hebrew,” *Departmental Bulletin Paper* (Kyoto University, 2000); R. Nir, “Ordiff” (Word Formation in Modern Hebrew), (Tel Aviv: The Open University, 1993); R. Nir. “On the Processes of Generating New Roots.” M. Arad, *Roots and Patterns – Hebrew Morpho-Syntax* (Dordrecht: Springer 2005); T. Notarius, “Multiradical Roots;” O. Schwarzwald, “Three Related Analyses in Modern Hebrew Morphology,” in *Egyptian, Semitic and General Grammar. Studies in Memory of Haim J. Polotsky* (ed. G. Goldenberg and A. Shisha-Halevy; Jerusalem: The Israel Academy of Sciences and Humanities, 2009), pp. 277–301; O. Schwarzwald, “מָשְׁרַטְנָה פַּלֵים וְתֵּשׁוּבָה: הַכְּלָל הַחֲסִיסָה וְצִוָּרָה” (Some Notes on Consonant Reduplication in Hebrew: Reproduction and the Addition of Consonants), *Helkat Lashon* 50 (2017), pp. 207–223; O. Schwarzwald, (חקירות ביבראית תבה מוניות), (Studies in Contemporary Hebrew), (Jerusalem: The Academy of the Hebrew Language, 2018).
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parent noun becomes part of the new verbal root. In reduplication patterns, the reduplication can originate in the parent noun, as in *laḥaṭeq ‘circus trick’>*liḥaṭeq ‘perform circus tricks’, *baqbuq ‘bottle’>*biqbeq ‘bottle, v.’ or arise in the process of verbal derivation, as in *dover ‘spokesperson’>*divrer ‘act as spokesperson’ *daf ‘page’>*difdeq ‘turn pages’. The second method of deriving quadriliteral roots – direct expansion, involves adding one or more consonants to an existing verbal root, without the mediation any existing noun, as in *ṣaḥaq ‘laugh’>*ṣiḥeq ‘titter’, ḥazar ‘return, repeat’>*ṣiḥzer ‘reconstruct, reenact’. The third method of deriving new roots is through phono-semantic imitation, mostly through onomatopoeia, as in *zīzmēm ‘buzz, hum’ and *ṣīqeq ‘make a clicking sound’, but sometimes also through other kinds of phono-semantic imitation, as exemplified by *ji’jea ‘hobble, stagger about’. This type of derivation can involve ideophones, phono-semantic expressions symbolically representing a sound, feeling, smell or facial expression, such as *tiq-taq>*tiqteq ‘tick’, *din-don>*dindin ‘ring’. For the purpose of defining the constraints on derivation in the *pilpel pattern, I will treat this kind of derivation as an imitation of the sound, which can be expressed as an ideophone or as a verb.

Whereas the first method of derivation – via a mediating word – produces verbs in all the quadriliteral root patterns, verbs derived through onomatopoeia overwhelmingly favor the *pilpel pattern. The method of direct expansion produces verbs in only four patterns: *pilpel, pi’lel, šif’el and tif’el. As stated, three of them – *pilpel, pi’lel and šif’el – developed particular meanings. The common denominator of all three is that they allow derivation without the involvement of a mediating word. This, then, seems to be a necessary condition for quadriliteral root patterns to acquire a specific meaning in MH. The only one pattern that allows derivation by direct expansion and did not develop a particular meaning is tif’el. Nearly all the verbs formed in it were derived from a noun that has an initial t- as part of the noun pattern, e.g., *tigboret ‘reinforcement’>*tigber ‘reinforce’, and two verbs were formed by adding t- to an existing noun: *deleq ‘fuel’>*tidleq ‘fuel’. The productivity in direct expansion is very low: only four verbs were formed by

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12. R. L. Watson, “A Comparation of Some Southeast Asian Ideophones with Some African Ideophones,” in Ideophones: Typological Studies in Language (ed. F. K. Erhard Voeltz and C. Kilian-Hatz; Amsterdam: Benjamins, 2001); O. Schwarzwald, “Some Notes on Consonant Reduplication.”
direct expansion of a verbal root: š-‘l ‘ask’>tišʾel ‘question’, p-‘l ‘act’>tifʾel ‘activate’, ‘d-f ‘prefer’>tiʿdef ‘prioritize’, s-k-l ‘thwart’>tiskel ‘frustrate’. This pattern has the potential to develop a particular meaning, but it has not yet done so.

Let us now examine the productivity of the patterns that developed a particular meaning. The chart below represents the productivity of the šifʾel, pilpel and piʿlel patterns, namely the verbs that were formed in these patterns in MH and continued to be used, and also shows how many verbs in each pattern express the meaning associated with the pattern.

| Patterns | Verbs in Pattern | Verbs Expressing Associated Meaning |
|----------|------------------|-------------------------------------|
| pilpel   | 35               | 28                                  |
| piʿlel   | 13               | 12                                  |
| šifʾel   | 5                | 0                                   |

Chart 1: Productivity of the quadriliteral patterns in Modern Hebrew and the number of verbs that express the meaning associated with the pattern

Chart 1 presents the number of verbs that were coined in MH in each pattern and continued to be used: 40 verbs in the pilpel pattern, 41 in the piʿlel pattern and 14 in the šifʾel pattern. The overwhelming majority of the verbs

13. There are also verbs that were coined but did not take root in MH: 29 in the pilpel pattern, 37 in the piʿlel pattern and 5 in the šifʾel pattern. The verb ‘ivrer ‘rendered into Hebrew’ took root for a while but was later replaced by a different quadriliteral verb, ‘ivret.
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in šifʿel and pilpel express the meaning associated with the pattern, versus only a third of the verbs in the piʿlel pattern.14

5. CONSTRAINTS ON PARTICULAR MEANING OF THE VERBS WITHIN THE PATTERN

As stated above, the patterns that developed a particular meaning are those that allow derivation by direct expansion from the existing verbal root. It is therefore not surprising that, within each pattern, the verbs which convey these meanings are mainly the ones derived in this method. Verbs in the pilpel pattern can convey the particular meaning even when they are derived from a noun (or from some other non-verbal lexical item), but only if the reduplication arose in the derivation of the verb (e.g., daf ‘page’>difdef ‘turn pages’, hen ‘yes’>hinhen ‘nod’, qav ‘line’>qivqev ‘fill in an area with lines’, kafa ‘slap, blow’> kifkef ‘slap, beat up’, English zap>zipzep ‘channel-surf’) and is not part of the parent word itself, as in the case of baqbuq ‘bottle’>biqbeq (verb) ‘bottle’15 Pilpel-verbs convey their typical meaning also when they are derived through onomatopoeia. Let us elaborate on the factors that constrain the derivation of verbs expressing the typical semantics of each pattern.16

Šifʿel: The data shows that, with two exceptions – šixnea‘ ‘persuade’ and šiqleṭ ‘transcribe from a recording’ – all the verbs in this pattern express the typical meaning of the pattern, namely the restoration of a previous situation or repetition of a previous action (e.g., šihzer ‘reconstruct’, šihlef ‘replaced

14. For a full list of verbs coined in MH in each of these three patterns and continue to be used, see the appendix.
15. It should be noted that the verbs that do not convey the typical meaning of the pattern tend to express the type of meaning characteristic of denominative verbs: an event, state or process in which the referent of the parent noun has a role. For instance, the verb biqbeq, derived from the noun baqbuq ‘bottle’, means ‘to put liquid into bottles,’ where the bottle is the destination of the action, and the verb tisreṭ, derived from the noun tasriṭ ‘screenplay’ means ‘write a screenplay,’ where the screenplay is the target of the action. On the semantics of denominative verbs and the role of the parent noun, see: E. Clark and H. Clark, “When Nouns Surface as Verbs,” Language 55/4 (1979), pp. 767–911; P. Kiparsky, “Remarks on Denominative Verbs,” in Argument Structure (ed. A. Alsina, J. Bresnan and P. Sells; Stanford: CLSI, 1997), pp. 473–499; M. Labelle, “The Semantic Representation of Denominal Verbs,” in Lexical Specification and Insertion (ed. P. Everaert and J. Grimshaw; Amsterdam: Benjamins, 2000), pp. 215–240. On this phenomenon in Hebrew, see: G. B. Sarfatti and K. Dubnov, ה鹧אש פצלאש, פּוּדָה (Semantics of Denominative Verbs), Lĕšonénu 64/3–4 (2000–2001), pp. 311–325.
16. The method by which each verb was derived was determined based on the Even-Shoshan dictionary.
again’, šixtev ‘rewrite’, ši’teq ‘reproduce’) or, in a handful of cases, an increase on a scale (e.g., šidreg ‘upgrade’, šinmex ‘downgrade’). This stems from the fact that, in MH, unlike in earlier periods of the language, šif’el verbs were coined only through the direct expansion of the root. It should be mentioned that Hebrew also has two triliteral verbs formed by adding š- to a biliteral root: šinea ‘transport, relocate’ and šiqem ‘restore, rehabilitate’. The first is close to the meaning associated with šif’el and the last one clearly displays it.

Pilpel: Most of the MH verbs coined in this pattern likewise express the typical semantics of the pattern, namely a series of short consecutive events or a single event of this sort. Pilpel-verbs are derived in three ways: by the direct expansion of a verbal root (e.g., ḥ-x-x>ḥixhex ‘cough slightly, clear one’s throat’); through a parent word – either one with a biliteral stem that was expanded into a quadriliteral root (e.g., daf>difdef), or one that already had a quadriliteral stem (e.g., baqbuq>bqi̇qėq) – and through onomatopoeia, e.g., šiqeq, zimzem. In MH onomatopoeic words are coined almost exclusively in the pilpel pattern, which provides an iconic imitation of the repeating sound. Only five new verbs in the pilpel pattern fail to convey the typical meaning of the pattern. In two of these cases, this is not surprising, since they are derived from nouns that already feature the reduplication: bqi̇qėq ‘bottle’, from the noun baqbuq ‘bottle’, and lišleš ‘produce guano’, from lašlešet ‘guano’. Only three are exceptions to the generalization presented here, since they were derived by reduplicating the biliteral stem of a parent noun, yet do not convey the meaning of the pattern: hithanhen ‘act coyly’, from the noun ḥen ‘grace’; gizgez ‘step on the gas, accelerate’, from the borrowed word gaz ‘gasoline’, and hitfanfen ‘have fun’, from the borrowed word fan ‘fun’, the last two being colloquial and quite rare. Presumably, these verbs were derived in the pilpel pattern in order to preserve the sound of the parent word. Creating a verb in a different pattern would have required expanding them into triliteral roots, making the new verb less transparent.

Pi’lel: In this pattern the proportion of verbs that express the particular meaning of the pattern – namely a diminutive meaning – is low compared to the other patterns. This meaning is expressed only by the verbs that were derived by direct expansion, not by those that were derived via another word,
whether the reduplicated radical originates in the parent word or was produced in derivation. If we separate the two categories – the denominative verbs and those derived by the direct expansion of a verbal root – a very clear picture emerges: all 13 verbs derived through direct expansion convey the diminutive meaning, e.g., ṣihqeṣ, ʾiqṣeṣ, diqrer, qipṣeṣ, ʾṣirqeṣ.\(^{17}\)

Denominative derivation in this pattern is generally the result of various constraints. In cases where the reduplication is present in the parent word, we find typical denomintive derivation, e.g., lihaṭeṭ ‘perform circus tricks’ from lahaṭuṭ ‘circus trick’ or siḥrer ‘spin’ from ṣḥarḥoret ‘dizziness’. In cases of a triliteral nominal stem that was expanded by reduplication to produce a quadriliteral verbal root, several constraints stand out. One is the need to preserve the phonetics of the parent word, especially its syllable structure. For example, the piʿlel-verbs fiqses ‘fax’ and mikses ‘mix’ preserve the final consonant cluster of the parent nouns faks ‘fax’ and miks ‘mix’, respectively, which would have been split apart in the derivation of a triliteral root.\(^{18}\)

Another constraint is the need to create a semantic distinction in cases where the rubric of triliteral piʿel verb is already occupied, for instance in deriving the verb divrer ‘act as spokesperson’ from the noun dover ‘spokesperson’. In this case a triliteral verb already exists – the verb diber ‘spoke’ – and reduplication allows to form a distinct verbal form. The verb kidrer ‘dribble a ball’, derived from the noun kadur ‘ball’, exemplifies yet another constraint. In this case the triliteral form kider is not occupied, yet it was not utilized as a verb meaning ‘dribble’. My guess is that the piʿlel pattern was preferred because, in terms of its semantics, ‘dribble’ is a multiplicative verb, denoting a series of short consecutive events. The pattern most typically used to express this meaning, namely pilpel, is unavailable in this case, since the noun is based on a strong triliteral root. Hence, the other available reduplicative pattern, piʿlel, was chosen.

The study thus shows that nearly all verbs formed in the šifʿel, piʿlel and pilpel patterns express the meaning associated with their pattern – unless some

\(^{17}\) As for the verb ʾišrer ‘ratified’, it is possible to assume either direct expansion of the root ʾ-ṣ-r or denominative derivation from the noun ʾiṣur ‘permit, approval’. If the derivation was not denominative, this is a single exception to the generalization above.

\(^{18}\) S. Bolozky, “Word Formation: Denominative Verbs;” S. Bolozky, Strategies of Modern Hebrew Verb Formation. Hebrew Annual Review 6 (1982), pp. 69–79.; O. Schwarzwald, “Innovative Elements;” O. Schwarzwald, Studies in Contemporary Hebrew, pp. 49–51.
constraint prevents this. The constraint shared by all three patterns involves derivation via another word, which blocks the assigning of the pattern’s meaning. *Pilpel*-verbs can express the typical meaning if derived via onomatopoeia or even from another word, as long as the reduplication occurs in the verb, not in the parent word. It was also shown that, in the case of *piʿlel*, various constraints yielded a high proportion of verbs that do not display the typical meaning.

6. THE PROCESS OF DEVELOPMENT OF THE PATTERNS’ PARTICULAR MEANINGS

The three patterns under discussion all existed before MH, but only *pilpel* was highly productive in the earlier stages, while *piʿlel* and *šifʿel* produced only a handful of verbs. Only 9 *piʿlel* verbs and 7 *šifʿel* verbs are attested in premodern Hebrew, versus 131 verbs in the *pilpel* pattern.19 *Pilpel* is also the only pattern that began acquiring a particular meaning before the MH period.

This section traces the development of the meaning associated with each of the three patterns and examines the factors that influenced this development in MH. The description of the processes is based on the language products and the order of their emergence. The discussion of the influencing factors makes plausible suggestions based on the history of Hebrew, data on the development of the Hebrew verbs under investigation, and certain linguistic characteristics of the languages that influenced MH. However, it should be kept in mind that these suggestions cannot be fully proved.

I suggest that the substrate languages of MH had a considerable role in prompting and accelerating the development of the specific meanings associated with the quadriliteral root patterns. The influence of these languages was especially strong during the Revival Period, in the late 19th century and the early decades of the 20th. During this period there were many gaps that needed to be filled in Hebrew, which was regaining its role as a spoken language used in all areas of life. Furthermore, many of its users – including writers who made considerable contributions to its development –

19. As a matter of fact, with the exception of *pilpel*, all the quadriliteral patterns that existed in the pre-modern periods – *piʿlel*, *tifʿel*, *šifʿel*, *mifʿel* and *ʾifʿel* – were only marginally productive. The most productive were the three examined in this study. This finding is based on a broader study of the productivity of the Hebrew verbal system which I am currently writing as my PhD dissertation.
were native speakers of Yiddish whose language of culture was Russian.\textsuperscript{20} The influence of these languages persisted in later periods as well, because they continued to be spoken, despite the Hebrew-only policy that was dominant in the decades immediately before and after the establishment of the state. Other factors that affected the development of the patterns’ particular meanings – such as reanalysis and analogy – will be examined as well.

Pilpel:\textsuperscript{21} As stated, 131 verbs in the pilpel pattern are attested in premodern Hebrew. The Bible contains only 24. The majority of verbs, 91, were coined in the Mishnaic Hebrew, while Medieval Hebrew added 16 more. In MH the pattern retained and even increased its productivity, yielding 77 new verbs, although only 40 took root and are still used today. The verbs were coined throughout the MH period, starting in the Revival Period and continuing in Contemporary Hebrew.

The association of pilpel with the multiplicative-semelfactive aspect began to develop in Mishnaic Hebrew, and grew steadily stronger, until in MH it became almost absolute: nearly all pilel-verbs coined in this period convey this meaning, and nearly all multiplicative-semelfactive verbs coined in this period are in the pilpel pattern. This is the picture that emerges from an analysis of the two classes of verbs – the semantic class of multiplicative-semelfactive verbs and the morphological class of pilpel verbs – throughout the history of the language. In Biblical Hebrew, many multiplicative-semelfactive verbs appear in patterns other than pilpel, e.g., yanaq ‘suckle’, galal ‘roll up’, laš ‘knead’, ga’a ‘lowe’ and našam ‘breathe’. The same is true in Mishnaic Hebrew, as exemplified by bahaš ‘stir’, ganah, ‘groan, moan’, ḥaxax ‘scratch, rub’, kasas ‘nibble, grind’, la’as ‘chew’. The relationship between the two classes of verbs is presented in the following chart. Since the number of verbs coined in Medieval Hebrew is small, the data for this period is conflated with the data for Mishnaic Hebrew.

\textsuperscript{20} Doron, M. Rappaport Hovav, Y. Reshef and M. Taube, “Introduction,” in Linguistic Contact, Continuity and Change in the Genesis of Modern Hebrew (ed. E. Doron, M. Rappaport Hovav, Y. Reshef, & M. Taube; Amsterdam: Benjamins, 2019).

\textsuperscript{21} The development of the multiplicative-semelfactive meaning of the pilpel pattern is described in detail in a paper of mine “The Development of Quadrilateral Reduplicated Roots as an Aspectual Marker in Modern Hebrew” to be published in Lĕšonênu. The discussion below presents the main points of the process.
Chart 2: The growing association between multiplicative-semelfactive aspect and the *pilpel* pattern

As evident from Chart 2, in Biblical Hebrew most of the verbs conveying the multiplicative-semelfactive aspect were not in the *pilpel* pattern, and most of the verbs in the *pilpel* pattern did not convey the multiplicative-semelfactive aspect. The two classes began to converge in the Mishnaic period, and in MH they overlap almost completely.

The process observed in Hebrew seems to be anchored in universal phenomena. As is well known, reduplication is often motivated by morphophonological factors but has semantic potential as well. Expanding a root in order to slot it into a particular morphological pattern is one of the well-known motivations for reduplication cross-linguistically. 22 In Mishnaic Hebrew many weak verbs with only two stable radicals changed their form to the *pilpel* pattern. 23 Some of them had conveyed the multiplicative-semelfactive aspect already in their original Biblical form, and retained this meaning in their new Mishnaic form, e.g., *mašaš* ‘suck’>*mişmeš*; *naṭaf* ‘drip’>*tiftef*; others assumed this meaning along with the new form, so that the semantic distinction between the Biblical verb and the Mishnaic one was reflected

22. S. Inkelas and C. Zoll, *Reduplication: Doubling in Morphology* (United Kingdom: Cambridge University, 2005), pp. 13–15, 20–21.
23. On this phenomenon see A. Bendavid, *לשון מקרא ולשון חכמים* (Biblical Hebrew and Mishnaic Hebrew) (Jerusalem: Dvir, 1967), p. 485.
morphologically as well, e.g., *nad* ‘wander, move’→*nidned* ‘move s’t back and forth’; *ṣaḥāḥ/ṣah* ‘be smooth, pure’→*ṣihṣeḥ* ‘shine s’t by rubbing’.

Over time, the pattern became associated with this aspectual meaning – a series of short, consecutive atomic events (multiplicative), or a single event of this sort (semelfactive). The connection between plurality and reduplication is likewise known cross-linguistically. Reduplication is one of the common ways of marking plurality, and plurality of various sorts is a common meaning of reduplicative forms such as *pilpel*. Moreover, some languages derive the multiplicative from the semelfactive by reduplication, such as Armenian: *dxk-al* ‘receive one resounding blow’→*dxk-dxk-al* ‘make repetitive noises’. It seems that, in Hebrew, the reduplication of the biliteral stem came over time to be understood as an iconic expression of plurality, in this case the repetition of minimal events in a series.

Another factor that contributed to the development of the typical semantics of the *pilpel* pattern was the tendency to use this pattern in the formation of onomatopoeic verbs. Sound-symbolism and especially onomatopoeia is one of the well-defined semantic groups for reduplication in noun derivation in Semitic languages, including the ancient ones. As for the verbs, and specifically pilpel that was productive in the premodern Hebrew, my earlier diachronic productivity study found that, in Biblical period, onomatopoeic verbs were not a prominent group within this category. But from one period to the next, the proportion of onomatopoeic verbs within the *pilpel* category

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24. O. Jespersen, *Philosophy of Grammar* (London: University of Chicago, 1924), ch. “Plural of the Verbal Idea,” pp. 210–211.
25. Inkelas and Zoll present the accepted notion that reduplication in verbs is an iconic marking of iterativity or pluractionality but emphasize that the association between them is not absolute, of course. See S. Inkelas and C. Zoll, *Reduplication*, pp. 13–14.
26. J. Knjazev, “Multiplicative Verbs.”
27. The reference here is not to all onomatopoeic verbs, in the broad sense, as presented for example in P. Kirtchuk, “Onomatopoeia,” in *Encyclopedia of Hebrew Language and Linguistics* (ed. G. Khan; Brill, 2013). Rather, the reference is to verbs coined in the *pilpel* pattern in imitation of a sound. Hence, the Mishnaic verb *biʿbea* ‘bubble’ is not part of this category, because it was coined from the Biblical noun *buʿa* (which is probably onomatopoeic itself), and the same goes for the verbs *hidhed* ‘echo v.’, derived from *hed* ‘echo’, and *liʿleʿ* ‘gargle’, derived from *loa* ‘maw’. Conversely, the verb *ṣiqṣeq* ‘make a clicking sound’ is counted among the onomatopoeic verbs, because it was coined directly in the verbal system, or perhaps based on the ideophone *ṣiq-* *ṣiq* (*ṣiq-* *suq*), and the same is true of *ṣiqṣeq* ‘rattle’ and *birber* ‘chatter, burble’, for example.
28. A. M. Butts, “Reduplicated Nominals Patterns in Semitic,” *Journal of the American Oriental Society* 131/1 (2011), pp. 83–108.
29. see n. 7.
increased: from 4% in Biblical Hebrew to 13% in Mishnaic and Medieval Hebrew and 46% in MH. As Schwartzwald notes, the coining of onomatopoeic verbs in the pilpel pattern is motivated by a morphological factor – avoiding monosyllabic verbs – and by a semantic one – using reduplication to iconically represent the repetitious character of the sound. The presence of many onomatopoeias among the pilpel verbs is not surprising, since it is universally observed that many multiplicative/semelfactive verbs are onomatopoeic. Based on a review of onomatopoeic verbs in numerous languages, Knjazev determined that a significant majority of them express this aspect. In Hebrew these verbs tend to appear in the pilpel pattern.

The use of this pattern to express onomatopoeia also stems from the characteristics of Hebrew as a Semitic language. Cross-linguistically, ideophones often involve the repetition of a syllable, either identically or with a change of vowel, e.g., Hebrew šif-ṣif representing the tweeting of a bird, and tif-taf representing the sound of dripping water. Ideophones can freely combine onomatopoeia and reduplication because they are less morphologically constrained than other lexical categories. Universally, many onomatopoeic verbs are derived from ideophones, and most express the multiplicative/semelfactive aspect. As Knjazev points out regarding Russian, there are often trios of items: ideophone–multiplicative–semelfactive. But in many languages verbal structure disallows the repetition of a syllable. This is evident in English, which combines onomatopoeia and reduplication in the ideophone tick-tock, but not in the verb tick. Russian too allows reduplication in onomatopoeic ideophones but usually not in the related verbs, as shown by the ideophone tik-tak vs. the verb tikat’, or the ideophone for a dog’s bark – gav-gav – vs. the verb gavkat’, although reduplication is allowed when the repeated syllable is open, e.g., gogotat’ ‟quack” šušukat’šja ‟whisper’. In sum, many languages have constraints on syllable structure that prevent the full or

30. O. Schwarzwald, “Some Notes on Consonant Reduplication.” Yannay and Tobin discussed the general connection between onomatopoeia and reduplication: Y. Yannay, “Multiradical Roots;” Y. Tobin, “Trying to ‘Make Sense’ Out of Phonological Reduplication.”
31. R. Watson, “A Comparation of Some Southeast Asian Ideophones with Some African Ideophones,” M. Dingemanse, “Ideophones and Reduplication,” Studies in Language 39/4 (2015), pp. 964–970.
32. J. Knjazev, “Multiplicative Verbs.”
33. See n. 29.
34. J. Knjazev, “Multiplicative Verbs.”
even partial repetition of a syllable in verbs. Hebrew, however, does allow this in the *pilpel* pattern.

Onomatopoeic verbs favor also the *pilpel* pattern due to another morphological characteristic of Hebrew as a Semitic language. The Hebrew verbal system is based on consonantal roots slotted into a template whose vowels change with inflection. Hence, when an onomatopoeic element like *tik* becomes part of a verb, its vowel will change with the verb’s template and inflection. In other words, regardless of the verb’s template or pattern, the vowels take no part in the iconic representation of the sound, which is thus always limited to the consonantal component. The *pilpel* pattern, which features a full reduplication of the consonantal component, strengthens the iconic element and thus has an advantage over other patterns in expressing onomatopoeia.

It is likely that the growing number of onomatopoeic verbs in the *pilpel* pattern reinforced the association of this pattern with the multiplicative/semelfactive aspect.

Other Semitic languages, such as Aramaic and Amharic, also have reduplicative verb-patterns, some of them expressing the multiplicative/semelfactive aspect, among other meanings. The Babylonian Aramaic equivalent of the *pilpel* pattern includes multiplicative/semelfactive verbs like *ga’ga’* ‘gargle’, *gamgam* ‘stutter’, alongside verbs that do not express this meaning, such as *lavlav* ‘sprout’, *šaṃsam* ‘reduce’. A question that comes to mind is whether any modern living Semitic languages exhibit far-reaching developments like those observed in MH. In a synchronic review of Amharic reduplicative verbs, Leslou identified features similar to those found in a synchronic review of Hebrew: intensive action, repetition, frequency, multiplicity of objects, action performed in a hurry, completion of an action, and attenuated action. Kahn’s synchronic study of Neo-Aramaic found that many verbs characterized by sound symbolism have a reduplicative quadrilateral root, although there are many other types of *pilpel* verbs as well. Examining reduplicative verbs in living Semitic languages from a perspective

35. Y. Yannay, “Multiradical Roots,” p. 125.
36. W. Leslou, *Reference Grammar of Amharic* (Weisbaden: Harrassowitz, 1995), p. 456.
37. G. Khan, “Sound Symbolism in Neo-Aramaic,” in *Near-Eastern and Arabian Essays: Studies in Honour of John F. Healey* (ed. G. L. Brooke, A. H. Curtis, M. al-Hamad, & G. R. Smith; Oxford University, 2018), pp. 197–214.
of diachronic productivity could reveal whether the situation in these languages is closer to that of Mishnaic Hebrew or to that of MH.

I suggest that the development of the pilpel pattern into an aspectual marker was accelerated by the influence of the substrate languages of MH. Writers of the Revival Period made fairly intensive use of new pilpel verbs, especially those that echo equivalent elements in Russian and Yiddish. Most of these verbs – some of which took root in the language and some of which didn’t – are onomatopoeic: birber ‘burble, jibber’, equivalent to Russian bormotat and Yiddish burtšen; gi’gea ‘quack’, equivalent to Russian gogotat and Yiddish gogotešen; šiqšeq ‘click’, equivalent to Russian cykat ‘click one’s tongue’ and cokat ‘clop’ and Yiddish coken; tiqteq ‘tick’, equivalent to Russian tıkta and Yiddish tiken; the verbs himhem ‘hum’, hirher ‘rasp’, qi’gea ‘coo’ and bísbes ‘speak in a deep voice’, which have equivalents in Russian; and the verbs nišneš ‘snack’, širšer ‘chirp, buzz’, bimbem ‘hum a tune using bim-bam sounds’ and pimpem ‘pump’, which have equivalents in Yiddish. Although similarity of onomatopoeic elements in different languages is not necessarily evidence of influence, several factors – namely, the number of verbs shared by Hebrew, Russian and Yiddish, the historic and social background of the Revival Period, and the fact that some of the verbs are found in translations of Russian texts – all support the assumption that these languages are the source of the onomatopoeic components in these verbs.

Russian and Yiddish also exerted more covert influence on Hebrew. For example, the verb difdef ‘turn pages’, derived from daf ‘page’, is apparently a calque of Russian listat, from list ‘page’. Another example is the verb nidned. In Mishnaic Hebrew it meant ‘move back and forth’, but in MH it also acquired the meaning ‘nag’, apparently under the influence of Russian nudit and Yiddish nodezšen, meaning ‘nag’ which include the consonantal element n-d.

The coining of new verbs in colloquial MH is also influenced by foreign tongues other than the substrate languages. For example, the verb zipzep ‘channel surf’ is based on the English word zap, in the sense of ‘move rapidly’.

38. D. E. Blasi, S. Wichmann, H. Hammarstrom, P. F. Stadler and M. H. Christiansen, “Sound-Meaning Association Biases Evidenced across Thousands of Languages,” Proceedings of the National Academy of Sciences of the USA (2016).
and the source of the verb *lirler* ‘chat’ is apparently a word in Moroccan Arabic. Generally speaking, the majority of *pilpel* verbs coined in MH were formed under the direct or indirect influence of other languages. Only five of these verbs have not been linked to any foreign lexical item: *hidhed* ‘echo’ (verb), from the noun *hed* ‘echo’; *hinhen* ‘nod’, from *hen* ‘yes’, *liʿle*a ‘gargle’ from *loa* ‘maw’, *riḥreḥ* ‘sniff’, from the bilateral root stem of the verb *heriah* ‘smell’ (verb), and *kivkev* ‘fill with lines’, from *kav* ‘line’.

In addition to its influence on the lexical level, Russian perhaps had covert influence on Hebrew in terms of the basic inclination to mark the multiplicative-semelfactive aspect. Russian has multiplicative and semelfactive verb-pairs. The multiplicative verb is morphologically unmarked (except for an imperfective marking), whereas the semelfactive is a perfective verb marked with the designated semelfactive suffix -*nu*. For example, *morgal* means ‘blink repeatedly’ while *morgnul* means ‘blink once’.

Perhaps the need to mark this aspect, prompted by Russian influence, reinforced the connection that already existed in premodern Hebrew between this aspect and the *pilpel* pattern. The borrowing of onomatopoeic elements from Russian may have strengthened the connection even further by associating the *pilpel* pattern with the Russian semelfactive affix.

In sum, the gradual association of the *pilpel* pattern with the multiplicative-semelfactive aspect was prompted by universal factors. It was facilitated by the fact that this pattern, like its equivalents in other Semitic languages, features reduplication which iconically represents repetition, and was accelerated by the influence of the substrate languages of MH.

The coining of new multiplicative-semelfactive verbs in the pattern has continued also in the recent decades.

**Piʿlel:** The *piʿlel* pattern was not particularly productive in the earlier periods of Hebrew, which yielded only nine definite cases of verbal roots in this pattern. The Bible has *ʾumlal* ‘withered’ alongside the passive participle *ʾamul*; *niflal*, a hapax legomenon supposedly meaning ‘fall’, which may be a *piʿlel*-form of the verb *nafal* ‘fall’ but may also be the *nifʿal* form of the root p-l-l; *šaʾnan* ‘serene’, whose source is unclear, since the Bible lacks any evidence of the root š-*n*, and the adjective *raʾnan* ‘fresh’, which is likewise

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39. J. Knjazev, “Multiplicative Verbs,” V. Chrakovskij, “Multiplicatives and Semelfactives,” V. Chrakovskij, “Typology of Semelfactive.”
the only apparent representative of its root, r-‘n (Medieval Hebrew later derived from it the verb ri‘nen, ‘refresh’). Mishnaic Hebrew has the verbs ‘irbev ‘mix’, from the Biblical root ‘-r-b, evident for instance in the Biblical verb hit‘arev ‘blend ’; sîrṣēt ‘draw’, an expansion of the root s-r-ṭ, evident in the Biblical verb saraṭ ‘scratched’; nîtmartṣēt ‘become ragged’, an expansion of the Biblical root m-r-ṭ ‘pluck’, and the verb qîrṣēt ‘cut into small pieces’, which may be a pi‘lel form but may also be a variant of qîrtem ‘pluck’. Another form coined in this period is the adjective meduvlal ‘tattered’, with the quadriliteral root d-b-l-l, whose etymology is unclear – perhaps a pi‘lel form and perhaps a blending of the roots d-l-l and b-d-l – and which gave rise to the little-used MH verb divlal ‘tatter’. Medieval Hebrew added the denominative verbs ʾifnen ‘shape’, from the Biblical ʾofen ‘way, method’; and šîfrer ‘improve’, from the Biblical root š-p-r ‘nice’ and possibly influenced by the Biblical noun šafrrîr ‘canopy’; the verb ši‘nen ‘shake, wave’, apparently an extension of the root š-‘-n ‘hand on’; and the adjective mešuqdad ‘decorated with almondshapes’.40 Even before the MH period, verbs in this pattern were coined both by denominative derivation and through direct expansion of root, but only in MH did the pattern develop a meaning of its own.

In MH, 79 verbs were coined in the pi‘lel pattern, 41 of which took root and are still in use. As stated above, only 13 were formed via the direct expansion of a verbal root, and all express the meaning of a diminutive or attenuated event. How did this meaning develop?

The verb which triggered the process was apparently šixqeq ‘titter, chuckle’, attested in 1909. It occurs for the first time in Hayim Nahman Bialik’s story “Short Friday”, in the sense of ‘chuckle’. The next four verbs to appear were šîrqeq ‘to make a light whistling or chirping sound’ (1935), zîmrer ‘sing lightly’ (1944), lihsēṣ ‘make small whispering sounds’ (1941), and ’ivšēṣ ‘make slight rustling sounds’ (1949). The mechanism at work here is one of analogy. Subsequently, the meaning was expanded from diminutive sound-event to diminutive events in general, mostly sensations, although none of these verbs coined at this stage are in frequent use. Among them are girderd ‘itch or scratch lightly’ (1949, rare), ’iqṣēṣ ‘prickle’ (1953), qîfṣēṣ ‘skip, hop’

40. The information on most of the verbs is sourced from Even Shoshan’s 1979 article “New-Old Binyanim," The roots m-r-ṭ, q-r-ṭ and š-‘-n-n appear only in his dictionary.
(1953), *riqded* ‘make small dancing motions’ (1953, rare), *nihrer* ‘snore lightly’ (1956, rare), *šivheah* ‘squeak’ (1956, rare), *diqrer* ‘prickle’ (1965, rare), and *bišlel* ‘cook briefly’ (1966, rare). We can see that MH certainly utilized the *pi’lel* pattern to form a series of new verbs with diminutive meaning, coined by analogy from existing verbs.

Here, too, the influence of the Slavic languages may have been at play. These languages form diminutive verbs by adding a prefix. In Russian, for example, the prefixes *po*- and *pri*- denote an attenuated action, e.g., *posmeivalsya* ‘titter’, *pokalival* ‘prickle’, *posvistival* ‘whistle lightly’, *pritancovival* ‘make small dancing motions.’ Nearly all the *pi’lel* verbs coined in MH have Russian equivalents with the prefix *po*.

Presumably, another factor at play was the existence of a similar mechanism in the Hebrew nominal system, which developed during the Revival Period, namely the use of reduplication to form diminutive variants of nouns and adjectives, e.g., *klavlav* ‘puppy’ from *kelev* ‘dog’ and *šmanman* ‘chubby’ from *šamen* ‘fat’. Although diminutives are the most common semantic group among reduplicated nouns in Semitic languages such as Akkadian, Arabic, Ge’ez and Syriac, in premodern Hebrew a similar situation may have been emerging, but this cannot be stated with certainty. A clear connection between reduplicated nouns or adjectives and diminutive meaning developed only in the Revival Hebrew, again probably under the influence of Slavic languages. It arose when writers of this period analyzed certain inherited reduplicative forms, such as *’adamdam* ‘reddish’ and *yeraqraq* ‘greenish’, as diminutive. The use of reduplication in the nominal system presumably reinforced its use in the verbal system as well.

As for the productivity of *pi’lel* in contemporary Hebrew, verbs in this pattern continue to be coined, but all 13 verbs coined since the 1970, have been the result of morphophonological constraints, and therefore do not

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41. A. M. Butts, “Reduplicated Nominals Patterns in Semitic.”
42. Zeev Yavetz proposed using this mechanism in Hebrew in 1891, and he also coined the word *klavlav*. Z. Yavetz, *שפת ציון* (The Language of Zion), *Haaretz, Collection B, Part 5* (1891), pp. 90–94. On reduplication as a diminutive marker in the MH nominal system, see: S. Bolozky, “On the Formation of Diminutives,” H. Sagi, *הקטנה בלשון הספרות בת זמננו* (The Diminutive in Contemporary Hebrew Literature), *Lĕšoněnu* 62 (1999), pp. 301–316; M. Bar-Asher, *פרקי עיון בערבית המודרנית בעברית* (Studies in Modern Hebrew), (Jerusalem: The Academy of the Hebrew Language, 2012), p. 62.
convey the diminutive meaning. The association of this meaning with this pattern may therefore be in decline.

Šifʿel: In earlier layers of Hebrew, the šifʿel pattern was neither productive nor associated with a particular meaning. In the premodern period only seven verbs in this pattern are attested, all of them in Mishnaic Hebrew: šiḥrer ‘free’, šixlel ‘improve’, šilhev ‘enflame, encourage’, ši bed ‘enslave’, ši mem ‘bore’ and širbev ‘insert, dangle’.43 All of these verbs are borrowed (directly or indirectly) from ancient Semitic languages like Akkadian, Moabite and Emorite, which had a causative šafʿel template, equivalent to Hebrew hifʿil. There is a consensus that, at least in some cases, the borrowing was via Aramaic.44 In some cases the verbs themselves were borrowed e.g., šixlel, and in others they were derived from a borrowed noun, as in the case of šilhev, from the borrowed noun šalhevet ‘flame’. All these verbs are causative, but the absence of direct expansion in this pattern prevented it from developing a more specific meaning in the premodern period.

MH shows the development of derivation by direct expansion in this pattern, and with it the emergence of a particular meaning. With one exception, all the šifʿel verbs coined in MH were derived by direct expansion. In this sense MH resembles Semitic tongues that have a šafʿel verbal pattern (binyan) more than it resembles premodern Hebrew, which created šifʿel verbs only by denomination from borrowed nouns or by borrowing verbs. In the MH period 20 new verbs were coined in this pattern, 14 of which took root and are still in use.

Only one of the verbs was attested before the 1950s, namely šixneʿ ‘persuade’, used in Yosef Haim Brenner’s 1911 novel From Here and There, where it means “cause someone to surrender in an argument,” based on the meaning of the root k-n-ʿ ‘to surrender’, as in the causative hixniaʿ ‘defeat, vanquish’. In other words, this verb does not express the meaning that eventually became associated with the pattern. But all the verbs coined later do express this meaning, except for one, šiqlet ‘transcribe from a recording’. Perhaps this verb was coined in the šifʿel pattern because the tifʿel pattern was

43. The list and etymology are based on A. Even-Shoshan, “Binyan Šifʿel.” Rabin suggests that the Mishnaic Hebrew verb širbeτ ‘stiffen’ and the Medieval verb ši nen ‘shake, wave’ also belong to this pattern. H. Rabin, “הַשַּׁפְּעֵל בְּבֵיתָם וּבִאָרָמִים – הָסִּיסֹת וּלְמָשַר עֲצָיו” (The šafʿel in Hebrew and Aramaic – Its Essence and Origin), Eretz Israel 9 (1969), pp. 148–158.
44. H. Rabin, “The Šafʿel.”
already taken by the verb tiqlet ‘act as a DJ’. Another question is why this verb was coined at all, given that there was already a verb timlel meaning ‘transcribe’. Perhaps because there was a need to coin a special verb for automatic transcription, as opposed to manual transcription.

How did the pattern acquire its particular meaning of restitution/repetition (re-) or in some cases an increase on a scale? I contend that the meaning originates in several šif‘el verbs that convey it by virtue of their root, not their pattern, but which underwent a process of reanalysis whereby the meaning became associated with the prefix š-. The new meanings may originate in inherited verbs. Specifically, the ‘re-’ meaning perhaps originates in the inherited verb šiḥrer ‘release, free’, which can be understood as ‘to make free again’. Note that the equivalent verbs in many European languages come from Old French relaisser and include the prefix re-. The ‘increase on a scale’ meaning perhaps derives from the inherited verb šixlel ‘improve’. This verb is causative, since the root k-l-l conveys wholeness or perfection, among other meanings, and the šif‘el verb thus means ‘cause to be [more] perfect’, or ‘increase in perfection’. This meaning is close to that of ‘increase on a scale’.

Another element that may have contributed to the development of the restitutive meaning is the triliteral verb šiqem ‘rehabilitate, rebuild’, constructed in the šif‘el pattern from the biliteral consonantal component of the weak root q-w-m ‘rise up’. First attested in 1945 in the context of rebuilding Europe after the war, šiqem combines the meaning of the original root, namely ‘rise’, with a causative meaning of šif‘el in Semitic languages, yielding the meaning ‘raise’. It was presumably coined in the šif‘el pattern because the other causative templates, pi‘el and hif‘il, were already taken by the forms qiyem ‘fulfill, maintain’ and heqim ‘build, found’. The semantic element of restitution in the meaning of šiqem subsequently became associated with the initial š-.

The three quadriliteral verbs coined in šif‘el after the verb šixnea’ (which, as stated, does not convey the typical meaning of the pattern) are šihzer ‘reconstruct, restore, recreate’ (1950), šidreg ‘upgrade’ (1953) and šixpel ‘copy, duplicate’ (1954). These verbs too underwent reanalysis. Their meaning initially emanated from the meaning of their original triliteral roots: h-z-r is associated with repeating and returning, d-r-g with degree, and k-p-l with reduplication. The š- thus originally contributed only a causative
meaning, yielding the meaning ‘cause s’t to repeat or be restored’, ‘cause to be upscaled’ and ‘cause to be doubled’. Later the meanings of ‘re-’ and ‘up-’ were ascribed to the verb-initial š-.

The verbs coined in subsequent stages were apparently produced through a mechanism of analogy. Nine of them took root: šixtev ‘rewrite’ (1955), šiʿrex ‘revaluate’ (1963), šizrea ‘reseed’ (1967), šihber ‘recompose’ (1968), šintea ‘replant’ (1972, rare), šihlef ‘replace’ (1980) and šitʿen ‘recharge’ (recent coining, rare). With the exception of šihlef, the original triliteral roots of these verbs do not convey the restitutive/repetative meaning or the meaning of increase in degree, so this meaning definitely originates in the pattern itself.

Like the other patterns discussed here, the šifʿel pattern was presumably influenced by the Slavic substrate languages of MH, and in this case also by contact languages, especially English. In the Slavic languages, both the restitutive/repetitive meaning and the meaning of increase in degree are expressed using prefixes. In Russian, the prefixes pere- and vos-/voz- are restitutive/repetitive (e.g., vosstanovil ‘restore, rehabilitate’; perepisal ‘rewrite’), and the prefix u- conveys an increase/decrease in degree (e.g., ulučšil ‘improve’, umenšil ‘diminish’). Especially noteworthy is the Polish prefix prze-, which, like Russian pere-, means ‘again’ (e.g., przerobiony ‘redo’, przebudowany ‘rebuild’). This prefix is pronounced pše-, and since the initial p- is almost silent for universal phonetic reasons, its sound is very close to Hebrew š-. In this case, Polish influence may have prompted not only the inclination to mark the repetition of an action with a prefix, but the particular choice of the pattern šifʿel, which begins with š-.45

The meanings of ‘redoing’ and of ‘increase in degree’ are also marked in the Romance languages, such as English and French. In English, repeated action is conveyed by the prefix re- (e.g., reanalyze) and increase in degree by the prefix up- (e.g., upgrade). Reshef has shown that the influence of English on Hebrew as a contact language was especially intense not during the British Mandate period but rather after the founding of the state.46

45. I am grateful to Keren Dubnov for pointing out the similarity between this Polish suffix and the first consonant of the šifʿel pattern following a lecture I gave at the 2020 conference “Early Summary of the EMODHEBREW (Emergence of Modern Hebrew) ERC project.”

46. Y. Reshef, “English in Israel: Sociolinguistic and Linguistic Aspects,” in Il Mio Cuore è a Orient: Studi di linguistica storia, filologia e cultura ebraica dedicati a Maria Mayer Moderna (ed. F. Aspesi et al., 2008), pp. 733–757.
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coincides with the productive stage of the šifʿel pattern and supports the claim that Romance languages were the source of many verbal calques in this period.

A question remains regarding the future productive potential of this pattern. We saw that, until now, its productivity has not been very high, and that in some cases the typical meaning emanates from the root, rather than the pattern. Bar Adon’s doctoral dissertation on the spoken Hebrew of children, published in 1959, found that the šifʿel pattern was prevalent in the speech of adults in his generation, but that children began using it only from age five-six, starting with the inherited verbs šiḥrer and šiʿmem, along with the modern šixneaʿ. Around age ten they started using the inherited verbs šiʿbed and šixel as well. Moreover, his study found that children did not create new verbs in this pattern.47 It seems that the limited productivity that existed in it was the provenance of writers. Dekel’s 2009 study found that, with the exception of Hebrew teachers, speakers of the language no longer perceive the pattern as conveying ‘again’ or an increase in scale.48 Indeed, the verb šiqleṭ, identified as the latest verb to be coined in it, does not express either of these meanings.

In the last 50 years, the pattern’s productivity has indeed been low. Moreover, in the recent decades, whenever Hebrew coined an equivalent of an English verb with the prefix re-, it did not form a calque in the šifʿel pattern but created a new root from the consonants of the English verb itself, including the prefix re-. For example, the Hebrew equivalent of the verb refresh (in the context of refreshing a screen), is the quadriliteral verb rifreš (used alongside the native Hebrew verb riʿnen), and the equivalent of the verb restart (again in the context of computers) is rister (used alongside the native Hebrew verb ʾitxel). The typical meanings of this pattern can be expressed in other ways as well. The Hebrew colloquial verb šipṣer ‘improve’, originally applied to military gear improved by soldiers using improvised means, is apparently an amalgamation of the verbs šipes ‘embellish, fix’ and šiper ‘improve’ or perhaps a contraction the expression šiper šura ‘improve shape’, and the verb ʿdken ‘update’ is an amalgamation of the words ʿd ‘until’ and kan ‘here’. The meaning can also be produced periphrastically, by adding modifiers such as

47. A. Bar-Adon, לְשׁוֹנָם המְדֻבָּרָתָן של הַיִּלְדֵי בְיִשְוָרָא (Children’s Hebrew in Israel), PhD dissertation (Hebrew University of Jerusalem 1959), pp. 2, 124.
48. N. Dekel, “The Šifʿel Binyan in Israeli Hebrew: Fiction or Reality?,” Leeds Working Papers in Linguistics and Phonetics 14 (2009), pp.1–15.
mexadaš ‘anew’ or yoter ‘more’. At present, then, it seems unlikely that productivity in šifʿel pattern will increase.

7. **CONCLUSION**

This paper discussed one of the ways in which MH uses inherited material to meet new needs. Several quadriliteral root patterns inherited from premodern Hebrew developed typical meanings of their own in MH, subject to morphological and semantic constraints. Three quadriliteral root patterns developed a particular semantic profile: šifʿel, associated with a restitutive/repetitive meaning and in some cases with an increase on a scale; piʿel, conveying a reduced or attenuated event, and pilpel, describing a series of short, consecutive atomic events or a single event of this sort – i.e., the multiplicative-semelfactive aspect. The first two of these patterns developed their particular meaning only in MH, whereas the meaning associated with pilpel dates back to the Mishnaic period but gained much more traction in MH.

The study examined quadriliteral root patterns from the perspective of diachronic productivity and found that typical meanings do not arise when the pattern produces verbs exclusively by denominative derivation. More specifically, verbs in the piʿel and šifʿel patterns assume the meaning of their pattern only when formed through direct expansion of the existing stem, whereas verbs in the pilpel pattern can assume this meaning in a broader range of circumstances: when coined through direct expansion, but also when derived by onomatopoeia or from a noun or other lexical non-verbal item, as long as the expansion of the root occurs in the verb itself.

Regarding the mechanisms involved in the development of the patterns’ particular meanings, it was suggested that the need to mark these particular verbal meanings arose under the influence of European languages, both the substrate languages of MH and other contact languages. Since European languages employ agglutinative affixes to mark various shades of verbal meaning, speakers of Hebrew felt the need for an equivalent mechanism, and the inherited quadriliteral root patterns were enlisted for this purpose. Given that Hebrew cannot add agglutinative affixes to verbs, the closest equivalent was employed instead, namely the expansion of the verbal root. As Heine and Kuteva show in their study of language contact, interlingual influence can often be covert. When this influence prompts a need to introduce a certain
function, languages seldom borrow structures or patterns from the contact language, but instead make use of their own native resources – as exemplified by the case under discussion.\textsuperscript{49} The emergence of the patterns’ particular semantic profiles also involved other mechanisms: analogy and reanalysis in all the patterns, and the borrowing of onomatopoeic elements in the \textit{pilpel} pattern.

Furthermore, the study shows that the process did not continue in the same way in all the patterns. The \textit{pilpel} pattern continues to be productive in contemporary Hebrew, but \textit{šifʿel} has not been productive in the recent decades and the productivity of the \textit{piʿlel} pattern is confined to derivation driven by morphophonological constraints, which does not produce verbs with the pattern’s typical semantic profile.

\textsuperscript{49} B. Heine and T. Kuteva, \textit{Language Contact and Grammatical Change} (Cambridge: Cambridge University, 2005).
APPENDICES

Appendix 1: Šīfʿel Verbs Coined and Still Used in Modern Hebrew

| Verbs displaying the meaning of the pattern: restitutive or repetitive, increase on a scale | Verbs not displaying the meaning of the pattern |
|-----------------------------------------------------------------|--------------------------------------------------|
| 1. šidreg ‘improve’ | šixneaʿ ‘persuade’ |
| 2. šizrea‘ ‘reseed’ | šiqlet ‘automatically transcribe an audio recording’ |
| 3. šiḥber ‘recompose’ | |
| 4. šiḥzer ‘restore, reconstruct’ | |
| 5. šiḥlef ‘replace again’ | |
| 6. šiṭ’en ‘recharge’ (rare) | |
| 7. šixpel ‘copy, reproduce’ | |
| 8. šixtev ‘rewrite’ | |
| 9. šinṣtea‘ ‘replant’ | |
| 10. šinmex ‘downgrade’ (rare) | |
| 11. širex ‘revaluate’ | |
| 12. šitėq ‘create a copy of an original work’ | |

Appendix 2: Pilpel Verbs Coined and Still Used in Modern Hebrew

| Verbs displaying the meaning of the pattern: a series of short atomic events or a single event of this sort | Verbs not displaying the meaning of the pattern |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| 1. bimbem ‘hum a tune using bim-bam sounds’ | bibqeq ‘bottle’ |
| 2. birber ‘chat, jibber’ | bitḥanhen ‘act coyly’ |
| 3. jimjem ‘improvise in music, jam’ (colloquial) | finfen ‘have fun’ (colloquial) |
| No. | Word | Meaning |
|-----|-------|---------|
| 4   | ji′jea’ | ‘hobble, totter’ (colloquial) |
| 5   | givgev | ‘mop’ (colloquial) |
| 6   | gi′gea’ | ‘quack’ |
| 7   | gifgef | ‘give a series of hugs’ |
| 9   | dinden | ‘ring, usually of a bell’ |
| 10  | difdef | ‘turn pages’ |
| 11  | hidhed | ‘echo’ |
| 12  | himhem | ‘hum, moan’ |
| 13  | hinhen | ‘nod’ |
| 14  | zimzem | ‘buzz’ |
| 15  | zipzep | ‘channel surf’ |
| 16  | ḥixḥex | ‘cough slightly, clear one’s throat’ |
| 17  | ḥirḥer | ‘rasp’ |
| 18  | ṭiṭizṭez | ‘shake’ |
| 19  | kiḥkeah | ‘cough’ |
| 20  | kifkef | ‘slap, beat up’ (colloquial) |
| 21  | li′lea’ | ‘make throaty sounds’ |
| 22  | lirler | ‘chat, chatter’ (colloquial) |
| 23  | nišneš | ‘snack, nosh’ |
| 24  | sivsev | ‘dribble a ball in front of another player’ |
| 25  | il′el | ‘leaf through’ |
| 26  | pihpeaḥ | ‘make huffing or growling sounds’ |
| 27  | pimpem | ‘eat sloppily, suck, pump’ |
| 28  | šıkšek | ‘make a clicking sound, with one’s lips or heels’ |
### Appendix 3: Piʿel Verbs Coined and Still Used in Modern Hebrew

| Verbs displaying the meaning of the pattern: a reduced or attenuated event | Verbs not displaying the meaning of the pattern |
|---|---|
| 1 ʾivšeš ‘rustle (of wind) | ʾivrer ‘ventilate’ |
| 2 bišlel ‘cook briefly’ (rare) | ʾinpef ‘speak through one’s nose’ |
| 3 girded ‘itch slightly’ (rare) | ʾapfel ‘darken slightly’ |
| 4 diqrer ‘prickle’ (rare) | ʾišrer ‘ratify’ |
| 5 zimrer ‘sing lightly’ | hitgavnen ‘became slightly bent’ |
| 6 liḥšeš ‘whisper’ | dvlel ‘tatter’ (rare) |
| 7 niḥrer ‘snore lightly’ (rare) | divrer ‘act as spokesperson’ |
| 8 ʾišqes ‘prickle, itch’ | zirgeg ‘ruin, have intercourse’ (rare) (colloquial) |
| 9 ʿivḥeq ‘squeal’ (rare) | ʾirit ‘talk or write nonsense’ (colloquial) |
| 9 ʿivḥeq ‘titter, chuckle’ | ʾivšeš ‘rustle (of wind)’ |
| 10 qifšeš ‘hop’ | kidrer ‘dribble (a ball)’ |
| 11 riqded ‘makes small dancing motions’ (rare) | liḥante ‘perform circus tricks, perform in a dazzling manner’ (rare) |
| 12 ʿivḥeq ‘titter, chuckle’ | ʿivšeš ‘rustle (of wind)’ |
| 13 | širqeq ‘whistle’ | liyeq ‘like (in the social media sense)’ |
| 14 | | miqses ‘mix (music)’ |
| 15 | nihses ‘ruin the mood’ (rare) (colloquial) |
| 16 | sihre ‘spin’ |
| 17 | simre ‘give the shivers’ |
| 18 | sifre ‘number’ |
| 19 | fiqse ‘fax’ |
| 20 | fiqšesh ‘blunder’ |
| 21 | hitpar’eah ‘become a brat, behave like a brat’ (colloquial) |
| 22 | pires ‘make a u-turn’ (colloquial) |
| 23 | šimrer ‘make s’o shudder’ |
| 24 | šinrer ‘install pipes’ |
| 25 | qivčeč ‘squeeze, squash’ (colloquial) |
| 26 | qiršeš ‘nitpick, pester’ |
| 27 | rifre ‘reference’ |
| 28 | šiqlel ‘adjust a calculation’ |