

## OLD FORMS, NEW FUNCTIONS: QUADRILITERAL ROOT PATTERNS AS SOURCES OF VERBAL MEANING<sup>1</sup>

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 pi'lel pattern, which describes a reduced or attenuated event, and the šif"el 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 a 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.<sup>2</sup> 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

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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: *pi'el*, *pu'al*, and *hitpa'el*.<sup>3</sup> 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

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3. Quadrilateral roots are confined to these templates because only they provide slots for four consonants. When a trilateral 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, "פעלים מרובי עיצורים בלשון העברית" (Multiradical Roots in the Hebrew Language), *Lěšonénu* 38 (1974); U. Ornan, "על יצירת שורשים חדשים ועל כמה מילים מחודשות" (On Creating New Roots and on a Few Renewed Words), *Lěšonénu 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 תהליכי היצירה של שורשים" (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. 289–347; T. Notarius, "Multilateral Roots," in *Encyclopedia of Hebrew Language and Linguistics* (ed. G. Khan; Brill, 2013); O. Schwarzwald, "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. Schwarzwald, "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 quadrilateral root patterns, this distinction is not essential, and the *pi'el* form will be taken to represent all the forms of a given quadrilateral 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 quadrilateral 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 quadrilateral roots, used mainly to form verbs and verbal nouns. Some of these roots consist of four different consonants ( $C_1C_2C_3C_4$ ), 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 *dīqlem* ‘recite, declaim’ borrowed from European languages. Others are formed by expanding a biliteral or trilateral root in a particular way, resulting in a pattern.<sup>4</sup>

In some cases, the expansion involves reduplication, producing the patterns *pi'lel* ( $C_1C_2C_3C_3$ ) and *pilpel* ( $C_1C_2C_1C_2$ ). For example, the biliteral stem of the noun *daf* ‘page’ was reduplicated to form the verb *difdef* ‘turn

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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 šif’el in Contemporary Hebrew), in *Ve’im 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, “בניינים חדשים-ישנים 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,” U. Ornan, המילה האחרונה: מנגנון התצורה של המילה העברית (The Final Word: The Mechanism of Hebrew Word Generation), (Haifa: Haifa University Press, 2003), pp. 103–126; G. Goldenberg, על שורשים, בניינים ושפעל” (On Roots, Binyanim and šif’el), *Lěšonénu* 58/3 (1995), 267–272; O. Schwarzwald and E. Neradim, “שפעל” (Hebrew šaf’el), *Lěšonénu* 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.

pages', with the quadrilateral root d-p-d-p in the *pilpel* pattern, and the trilateral root of the verb *šaḥaq* 'laugh' was expanded to form the verb *šiḥqeq* 'titter, chuckle', with the quadrilateral root ṣ-ḥ-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, ' 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, ' or š before a trilateral root, produces the patterns *tif'el* (tCCC), as in *tigber* 'reinforce'; *mif'el* (mCCC), as in *misper* 'number (v.)'; 'if'el ('CCC), as in 'ivhen 'diagnose' and šif'el (šCCC), as in *šidreg* 'upgrade'. Suffixation, adding the consonants n and t after the trilateral root, creates the patterns *pi'len* (CCCn), as in *digmen* 'model' and *pi'let* (CCCt), as in 'ivret '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*, *pi'lel* and *šif'el* – 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,<sup>5</sup> or as expressing various kinds of multiplicity.<sup>6</sup> My previous research, conducted from a perspective of diachronic productivity, characterized the product of this pattern in MH as

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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.<sup>7</sup> 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/s in such a series, as in *he nodded once/twice* (semelfactive aspect). These verbs usually describe movement or sound composed of rapidly repeated pulses.<sup>8</sup>

Pi‘lel: The reduplicative *pi‘lel* pattern can produce a diminutive effect, as exemplified by *šixqeq* ‘titter’, *iqšeš* ‘prickle, itch’, *diqrer* ‘prickle’.<sup>9</sup> 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., *šihqeq* ‘titter’, derived

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7. V. Agranovsky, “Quadrilateral Reduplicated Roots as Aspectual Marker in Modern Hebrew,” *EMODHEBREW research project ms.* (2019); V. Agranovsky, “ההוראה האספקטואלית של צריך לצלצל פעמיים” (The Development of Quadrilateral Reduplicated Roots as an Aspectual Marker in Modern Hebrew), *Lěšoněnu* (to appear).

8. The term “multiplicative-semelfactive aspect” is taken from the Russian tradition of linguistics. Alongside languages that distinguish the two aspects (Russian, Yakut, Komi, Lithuanian language, Aleut, Armenian), there are many others in which the same unmarked verb can express both, e.g., English *cough*, *knock*, *sneeze*, *blink*, *kick*. Russian linguistics regards “multiplicative” and “semelfactive” as related aspects. See A. Isachenko, *The Grammatical System of Russian Language in Comparison with Slovak. Morphology. Part 2.* [in Russian] (Bratislava: The Slovak Academy of Sciences, 1954–1965); J. Forsyth, *A Grammar of Aspect: Usage and Meaning in the Russian Verb* (Studies in the Modern Russian Language, Cambridge: Cambridge University Press, 1970); J. Knjazev, “Multiplicative Verbs” [in Russian], *Grammatical Semantics. The Russian Language in Typological Perspectives*, (Languages of Slavic Cultures 2007), Ch. 4.5, pp. 439–448; V. Chrakovskij, “Multiplicatives and Semelfactives – The Problem of the Aspect Pair” [in Russian]. in *The Semantics and Structure of Slavic Aspect*, v. 2 (Krakow: Wydawnictwo Naukowe WSP, 1997), pp. 227–239; V. Chrakovskij, “Typology of Semelfactive” [in Russian], in *Typology of Vid (Grammatical Aspect): Problems, Research, Solutions* (ed. Chertova; Moscow: Languages of Slavic Cultures 1998), pp. 485–490; V. Plungian, *Introducing Grammatical Semantics: Grammatical Values and Grammatical Systems in the World’s Languages* [in Russian] (Moscow: Russian State University for Humanities, 2011), pp. 221, 312, 321, 322. The general linguistic literature mostly uses the term “semelfactive,” referring to a single event in a series. This term gained currency after Comrie suggested adding it to the four lexical aspects proposed by Vendler (activity, accomplishment, achievement and state) and was subsequently developed further. See B. Comrie, *Aspect* (Cambridge University, 1976); C. Smith, *The Parameter of Aspect* (Dordrecht: Kluwer, 1991); S. Rothstein, “Two Puzzles for a Theory of Lexical Aspect: Semelfactives and Degree Achievements,” in *Event Structures in Linguistic Form and Interpretation* (ed. J. Dölling et al.; Walter de Gruyter, 2008), pp. 175–198. I chose the compound term “multiplicative-semelfactive,” rather than just “semelfactive,” to describe the meaning of the *pilpel* pattern, since multiplicativity is an important component of this pattern’s meaning and because the repetition of consecutive atomic events is iconically represented by the reduplication in this pattern.

9. A. Even-Shoshan, “New-Old Binyanim,”; S. Bolozky, “On the Formation of Diminutives in Modern Hebrew Morphology,” *Hebrew Studies* 35 (1994), pp. 45–61.

from *ṣahaq* ‘laugh’, *qifṣeṣ* ‘hop, skip’, derived from *qafaṣ* ‘jump’, and *liḥšeš* ‘made small whispering sounds’, from *laḥaš* ‘whisper’. These verbs preserve the aspectual meaning of the original verb and add a diminutive meaning.

Šif<sup>ʿ</sup>el: New verbs coined in the *šif<sup>ʿ</sup>el* pattern express the restitutive or repetitive meaning, namely redoing, as exemplified by *šihzer* ‘recreate, reenact’ and *šixtev* ‘rewrite’, and in some cases the meaning of increase on a scale, such as *šidreg* ‘upgrade’, *šinmex* ‘downgrade’.<sup>10</sup>

#### 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.<sup>11</sup> 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 *mispār* ‘number’ or the verb *tifqed* ‘function’ from the noun *tafqid* ‘role, position’. In affixation patterns, the consonant of the

10. A. Even-Shoshan, “Binyan šif<sup>ʿ</sup>el.”

11. On the ways of deriving quadriliteral roots, see *inter alia*: U. Ornan, “On Creating New Roots,” U. Ornan, “דרכי הידוש מילים” (Ways of Creating New Words), in *Hebrew Language in Development and Renovation* (Jerusalem: The Israel Academy of Sciences and Humanities, 1996), pp. 77–101; U. Ornan, *The Final Word*, pp. 113–116; A. Even-Shoshan, “Binyan Šif<sup>ʿ</sup>el,” A. Even-Shoshan, “New-Old Binyanim,” Y. Yannay, “Multiradical Roots,” S. Bolozky, “Word Formation Strategies: Denominative Verbs,” M. Ephratt, טבלת שורש-משקל: דרך המלך של תצורת המילה העברית (The Root-Pattern Array – The Main Tool of Hebrew Word Formation), PhD dissertation (Hebrew University of Jerusalem, 1985); T. Sasaki (Sadan), “מיון השורשים התנייניים בעברית החדשה” (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, דרכי היצירה המילוגית בעברית בת-זמננו (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, “Multiliteral 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, “עוד על יצירת פעלים חדשים בעברית: הכפלה ותוספת עיצורים” (Some Notes on Consonant Reduplication in Hebrew: Reduplication and the Addition of Consonants), *Helkat Lashon* 50 (2017), pp. 207–223; O. Schwarzwald, מחקרים בעברית בת זמננו (Studies in Contemporary Hebrew), (Jerusalem: The Academy of the Hebrew Language, 2018).

parent noun becomes part of the new verbal root. In reduplication patterns, the reduplication can originate in the parent noun, as in *lahatut* ‘circus trick’ > *lihatet* ‘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’ > *difdef* ‘turn pages’. The second method of deriving quadrilateral roots – direct expansion, involves adding one or more consonants to an existing verbal root, without the mediation any existing noun, as in *šahaq* ‘laugh’ > *šihqeq* ‘titter’, *ħazar* ‘return, repeat’ > *šihzer* ‘reconstruct, reenact’. The third method of deriving new roots is through phono-semantic imitation, mostly through onomatopoeia, as in *zimzem* ‘buzz, hum’ and *šiqseq* ‘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* > *dinden* ‘ring’.<sup>12</sup> 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 quadrilateral 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 quadrilateral 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 Comparison 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-ʾ-l ‘ask’>*tišʾel* ‘question’, p-ʾ-l ‘act’>*tifʿel* ‘activate’, ʾ-d-f ‘prefer’>*tiʾdef* ‘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 *šifʿel*, *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.

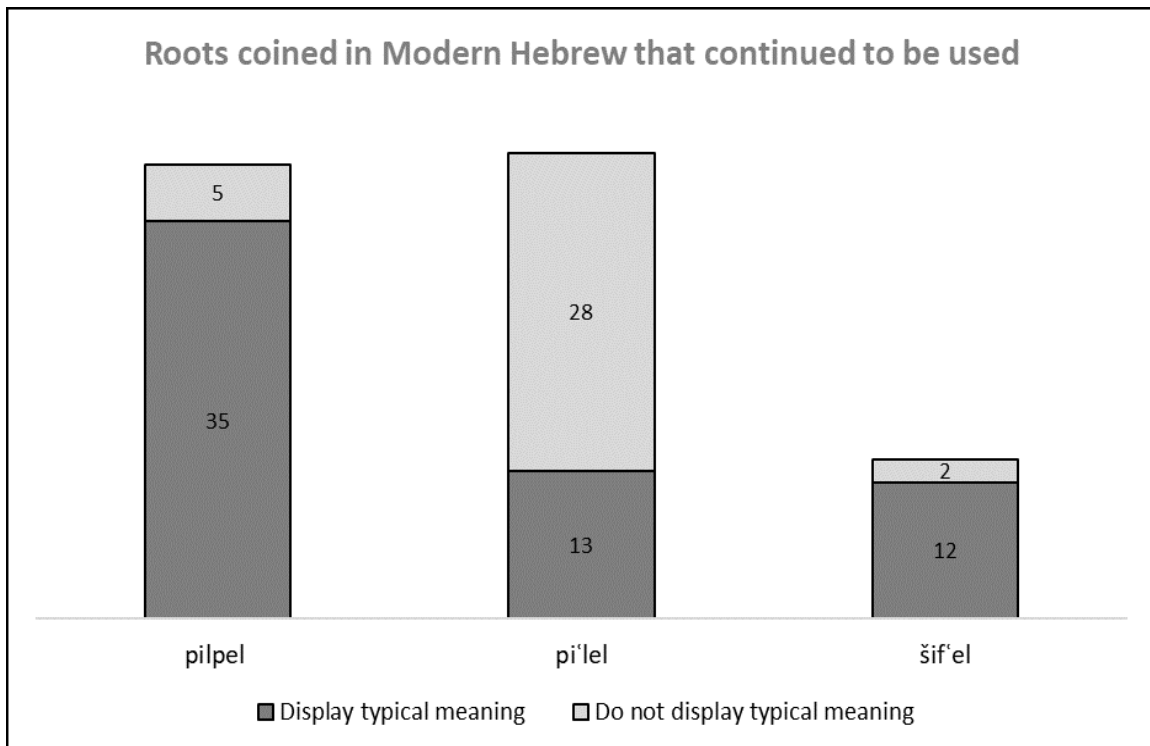


Chart 1: Productivity of the quadriliteral patterns in Modern Hebrew and the number of verbs that express the meaning associated with the pattern

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 *šifʿel* pattern.<sup>13</sup> 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 *šifʿel* pattern. The verb *ʾivrer* ‘rendered into Hebrew’ took root for a while but was later replaced by a different quadriliteral verb, *ʾivret*.

in *šif'el* and *pilpel* express the meaning associated with the pattern, versus only a third of the verbs in the *pi'lel* pattern.<sup>14</sup>

## 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'<sup>15</sup> *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.<sup>16</sup>

*Šif'el*: 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

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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, "הסמנטיקה של פעלים גזורי-שם" (Semantics of Denominative Verbs), *Lěšonénu* 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 trilateral 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>*hixhex* 'cough slightly, clear one's throat'); through a parent word – either one with a biliteral stem that was expanded into a quadrilateral root (e.g., *daf*>*difdef*), or one that already had a quadrilateral stem (e.g., *baqbuq*>*biqbeq*) – and through onomatopoeia, e.g., *šiqseq*, *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: *biqbeq* '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: *hitḥanḥen* '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 trilateral 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., *šihqeq*, *'iqšeš*, *dīqrer*, *qipšeš*, *širqeq*.<sup>17</sup>

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 denominative derivation, e.g., *lihaṭeṭ* 'perform circus tricks' from *lahaṭuṭ* 'circus trick' or *siḥrer* 'spin' from *šarḥoret* 'dizziness'. In cases of a trilateral nominal stem that was expanded by reduplication to produce a quadrilateral 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 *pi'el*-verbs *fiqsēs* 'fax' and *miksēs* '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 trilateral root.<sup>18</sup> Another constraint is the need to create a semantic distinction in cases where the rubric of trilateral *pi'el* verb is already occupied, for instance in deriving the verb *divrer* 'act as spokesperson' from the noun *dover* 'spokesperson'. In this case a trilateral 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 trilateral form *kider* is not occupied, yet it was not utilized as a verb meaning 'dribble'. My guess is that the *pi'el* 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 *piḥpel*, is unavailable in this case, since the noun is based on a strong trilateral root. Hence, the other available reduplicative pattern, *pi'el*, was chosen.

The study thus shows that nearly all verbs formed in the *šif'el*, *pi'el* and *piḥpel* patterns express the meaning associated with their pattern – unless some

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17. As for the verb *'išrer* 'ratified', it is possible to assume either direct expansion of the root *'-š-r* or denominative derivation from the noun *'išur* '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 *pi'lel*, 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 *pi'lel* and *šif'el* produced only a handful of verbs. Only 9 *pi'lel* verbs and 7 *šif'el* verbs are attested in premodern Hebrew, versus 131 verbs in the *pilpel* pattern.<sup>19</sup> *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 quadrilateral root patterns. The influence of these languages was especially strong during the Revival Period, in the late 19<sup>th</sup> century and the early decades of the 20<sup>th</sup>. 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 –

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19. As a matter of fact, with the exception of *pilpel*, all the quadrilateral patterns that existed in the pre-modern periods – *pi'lel*, *tif'el*, *šif'el*, *mif'el* and *'if'el* – 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.<sup>20</sup> 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:<sup>21</sup> 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 *pilpel*-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 *baḥaš* 'stir', *ganaḥ*, '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.

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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).

21. The development of the multiplicative-semelfactive meaning of the *pilpel* pattern is described in detail in a paper of mine "The Development of Quadriliteral Reduplicated Roots as an Aspectual Marker in Modern Hebrew" to be published in *Lěšonenu*. The discussion below presents the main points of the process.

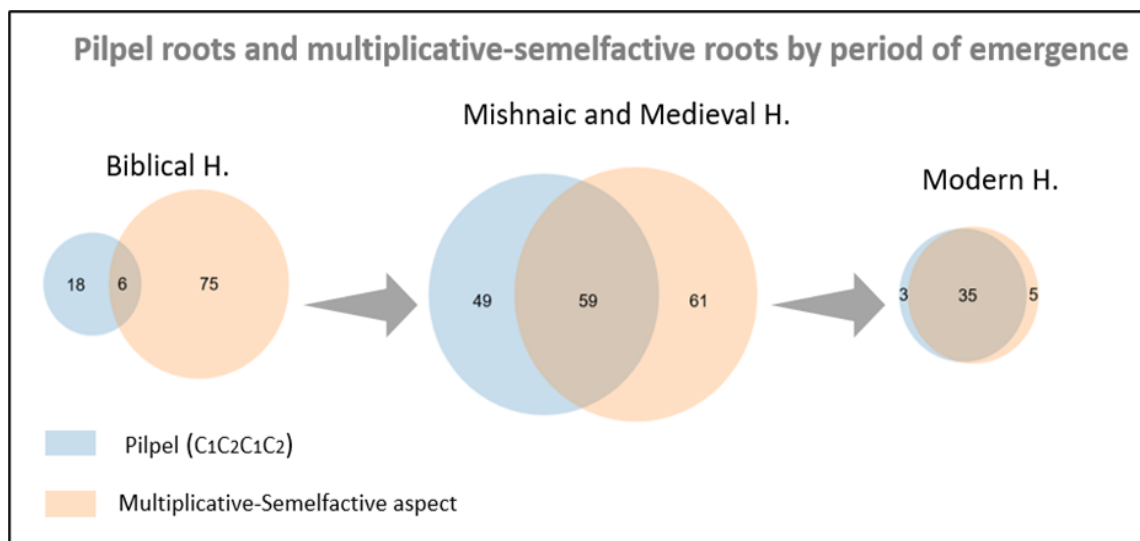


Chart 2: The growing association between multiplicative-semelfactive aspect and the *pilpel* pattern

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 morpho-phonological 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.<sup>22</sup> In Mishnaic Hebrew many weak verbs with only two stable radicals changed their form to the *pilpel* pattern.<sup>23</sup> 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’ > *mišmeš*; *naṭaf* ‘drip’ > *tiṭtef*; 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’; *ṣaḥaḥ/ṣaḥ* ‘be smooth, pure’ > *ṣihṣeaḥ* ‘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,<sup>24</sup> and plurality of various sorts is a common meaning of reduplicative forms such as *pilpel*.<sup>25</sup> 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’.<sup>26</sup> 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.<sup>27</sup> 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.<sup>28</sup> As for the verbs, and specifically *pilpel* that was productive in the premodern Hebrew, my earlier diachronic productivity study found that,<sup>29</sup> 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 *bi’bea* ‘bubble’ is not part of this category, because it was coined from the Biblical noun *bu’a* (which is probably onomatopoeic itself), and the same goes for the verbs *hidhed* ‘echo v.’, derived from *hed* ‘echo’, and *li’le* ‘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-ṣuq*), 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.<sup>30</sup> The presence of many onomatopoeias among the *pilpel* verbs is not surprising, since it is universally observed that many multiplicative/semelfactive verbs are onomatopoeic.<sup>31</sup> Based on a review of onomatopoeic verbs in numerous languages, Knjazev determined that a significant majority of them express this aspect.<sup>32</sup> 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-šif* representing the tweeting of a bird, and *tif-ṭaf* representing the sound of dripping water. Ideophones can freely combine onomatopoeia and reduplication because they are less morphologically constrained than other lexical categories.<sup>33</sup> 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.<sup>34</sup> 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`sja* ‘whisper’. In sum, many languages have constraints on syllable structure that prevent the full or

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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 Comparison of Some Southeast Asian Ideophones with Some African Ideophones,” M. Dingemans, “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,<sup>35</sup> 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', *šamšam* '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.<sup>36</sup> Kahn's synchronic study of Neo-Aramaic found that many verbs characterized by sound symbolism have a reduplicative quadriliteral root, although there are many other types of *pilpel* verbs as well.<sup>37</sup> Examining reduplicative verbs in living Semitic languages from a perspective

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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*; *šiqseq* 'click', equivalent to Russian *cykat`* 'click one's tongue' and *cokat`* 'clap' and Yiddish *coken*; *tiqteq* 'tick', equivalent to Russian *tikat`* and Yiddish *tiken*; the verbs *himhem* 'hum', *hirher* 'rasp', *qi'qea'* 'coo' and *bisbes* '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,<sup>38</sup> 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',

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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’, *li’lea* ‘gargle’ from *loa* ‘maw’, *rihreaḥ* ‘sniff’, from the bilateral root stem of the verb *heriaḥ* ‘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’.<sup>39</sup> 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.

Pi’lel: The *pi’lel* 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 *’umlal* ‘withered’ alongside the passive participle *’amul*; *niflal*, a *hapax legomenon* supposedly meaning ‘fall’, which may be a *pi’lel*-form of the verb *nafal* ‘fall’ but may also be the *nif’al* form of the root p-l-l; *ša’nan* ‘serene’, whose source is unclear, since the Bible lacks any evidence of the root š-’-n, and the adjective *ra’nan* ‘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-ʿ-n (Medieval Hebrew later derived from it the verb *riʿnen*, ‘refresh’). Mishnaic Hebrew has the verbs *irbev* ‘mix’, from the Biblical root ʿ-r-b, evident for instance in the Biblical verb *hitʿarev* ‘blend’; *sirṭeṭ* ‘draw’, an expansion of the root s-r-ṭ, evident in the Biblical verb *saraṭ* ‘scratched’; *nitmarṭeṭ* ‘become ragged’, an expansion of the Biblical root m-r-ṭ ‘pluck’, and the verb *qirṭeṭ* ‘cut into small pieces’, which may be a *piʿlel* form but may also be a variant of *qirṭem* ‘pluck’. Another form coined in this period is the adjective *meduvlal* ‘tattered’, with the quadrilateral root d-b-l-l, whose etymology is unclear – perhaps a *piʿlel* 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 *divlel* ‘tatter’. Medieval Hebrew added the denominative verbs *ʾifnen* ‘shape’, from the Biblical *ʾofen* ‘way, method’; and *šifrer* ‘improve’, from the Biblical root š-p-r ‘nice’ and possibly influenced by the Biblical noun *šafrir* ‘canopy’; the verb *šiʿnen* ‘shake, wave’, apparently an extension of the root š-ʿ-n ‘hand on’; and the adjective *mešūqdad* ‘decorated with almondshapes’.<sup>40</sup> 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 *piʿlel* 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 *širqeq* ‘to make a light whistling or chirping sound’ (1935), *zimrer* ‘sing lightly’ (1944), *liḥšeš* ‘make small whispering sounds’ (1941), and *ʾivšeš* ‘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 *girded* ‘itch or scratch lightly’ (1949, rare), *ʾiqšeš* ‘prickle’ (1953), *qifšeš* ‘skip, hop’

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40. The information on most of the verbs is sourced from Even Shoshan’s 1979 article “New-Old Binyanim,” The roots m-r-ṭ-ṭ, q-r-ṭ-ṭ and š-ʿ-n-n appear only in his dictionary.

(1953), *riqded* ‘make small dancing motions’ (1953, rare), *niḥrer* ‘snore lightly’ (1956, rare), *šivḥeah* ‘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,<sup>41</sup> 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.<sup>42</sup> 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), *Lěšonēnu* 62 (1999), pp. 301–316; M. Bar-Asher, פרקי עיון בעברית החדשה ובעשייה בה (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.

Šif<sup>ʿ</sup>el: In earlier layers of Hebrew, the *šif<sup>ʿ</sup>el* 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: *šihrer* ‘free’, *šixlel* ‘improve’, *šilhev* ‘enflame, encourage’, *ši<sup>ʿ</sup>bed* ‘enslave’, *ši<sup>ʿ</sup>mem* ‘bore’ and *širbev* ‘insert, dangle’.<sup>43</sup> All of these verbs are borrowed (directly or indirectly) from ancient Semitic languages like Akkadian, Moabite and Emorite, which had a causative *šaf<sup>ʿ</sup>el* template, equivalent to Hebrew *hif<sup>ʿ</sup>il*. There is a consensus that, at least in some cases, the borrowing was via Aramaic.<sup>44</sup> 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 *šif<sup>ʿ</sup>el* verbs coined in MH were derived by direct expansion. In this sense MH resembles Semitic tongues that have a *šaf<sup>ʿ</sup>el* verbal pattern (*binyan*) more than it resembles premodern Hebrew, which created *šif<sup>ʿ</sup>el* 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 *šixnea<sup>ʿ</sup>* ‘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-<sup>ʿ</sup> ‘to surrender’, as in the causative *hixnia<sup>ʿ</sup>* ‘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, *šiqleṭ* ‘transcribe from a recording’. Perhaps this verb was coined in the *šif<sup>ʿ</sup>el* pattern because the *tif<sup>ʿ</sup>el* pattern was

43. The list and etymology are based on A. Even-Shoshan, “Binyan Šif<sup>ʿ</sup>el.” Rabin suggests that the Mishnaic Hebrew verb *širbet* ‘stiffen’ and the Medieval verb *ši<sup>ʿ</sup>nen* ‘shake, wave’ also belong to this pattern. H. Rabin, “השפעל בעברית ובארמית – מהותו ומוצאו” (The *šaf<sup>ʿ</sup>el* in Hebrew and Aramaic – Its Essence and Origin), *Eretz Israel* 9 (1969), pp. 148–158.

44. H. Rabin, “The Šaf<sup>ʿ</sup>el.”

already taken by the verb *tikleṭ* ‘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<sup>ʿ</sup>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 *relaissier* 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<sup>ʿ</sup>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 trilateral verb *šiqem* ‘rehabilitate, rebuild’, constructed in the *šif<sup>ʿ</sup>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<sup>ʿ</sup>el* in Semitic languages, yielding the meaning ‘raise’. It was presumably coined in the *šif<sup>ʿ</sup>el* pattern because the other causative templates, *pi<sup>ʿ</sup>el* and *hif<sup>ʿ</sup>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 quadrilateral verbs coined in *šif<sup>ʿ</sup>el* after the verb *šixnea<sup>ʿ</sup>* (which, as stated, does not convey the typical meaning of the pattern) are *šiḥzer* ‘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 trilateral roots: ḥ-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), *ši‘rex* ‘revalue’ (1963), *šizrea* ‘reseed’ (1967), *šiḥber* ‘recompose’ (1968), *šintea* ‘replant’ (1972, rare), *šiḥlef* ‘replace’ (1980) and *šit‘en* ‘recharge’ (recent coining, rare). With the exception of *šiḥlef*, the original triliteral roots of these verbs do not convey the restitutive/repetitive meaning or the meaning of increase in degree, so this meaning definitely originates in the pattern itself.

Like the other patterns discussed here, the *šif‘el* 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 *šif‘el*, which begins with š-.<sup>45</sup>

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.<sup>46</sup> This

45. I am grateful to Keren Dubnov for pointing out the similarity between this Polish suffix and the first consonant of the *šif‘el* 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.

coincides with the productive stage of the *šif<sup>ˈ</sup>el* 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 *šif<sup>ˈ</sup>el* 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 *ših<sup>ˈ</sup>rer* and *ši<sup>ˈ</sup>mem*, along with the modern *šixnea<sup>ˈ</sup>*. Around age ten they started using the inherited verbs *ši<sup>ˈ</sup>bed* and *šixlel* as well. Moreover, his study found that children did not create new verbs in this pattern.<sup>47</sup> 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.<sup>48</sup> 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 *šif<sup>ˈ</sup>el* 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 quadrilateral verb *rifreš* (used alongside the native Hebrew verb *ri<sup>ˈ</sup>nen*), and the equivalent of the verb *restart* (again in the context of computers) is *rister* (used alongside the native Hebrew verb *itxel*). The typical meanings of this pattern can be expressed in other ways as well. The Hebrew colloquial verb *šipser* 'improve', originally applied to military gear improved by soldiers using improvised means, is apparently an amalgamation of the verbs *šipeš* 'embellish, fix' and *šiper* 'improve' or perhaps a contraction the expression *šiper šura* 'improve shape', and the verb *dken* 'update' is an amalgamation of the words *d* 'until' and *kan* 'here'. The meaning can also be produced periphrastically, by adding modifiers such as

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47. A. Bar-Adon, לשונם המדוברת של הילדים בישראל (Children's Hebrew in Israel), PhD dissertation (Hebrew University of Jerusalem 1959), pp. 2, 124.

48. N. Dekel, "The *Šif<sup>ˈ</sup>el* 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 *šif<sup>ʿ</sup>el* pattern will increase.

## 7. CONCLUSION

This paper discussed one of the ways in which MH uses inherited material to meet new needs. Several quadrilateral root patterns inherited from premodern Hebrew developed typical meanings of their own in MH, subject to morphological and semantic constraints. Three quadrilateral root patterns developed a particular semantic profile: *šif<sup>ʿ</sup>el*, associated with a restitutive/repetitive meaning and in some cases with an increase on a scale; *pi<sup>ʿ</sup>lel*, 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 quadrilateral 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 *pi<sup>ʿ</sup>lel* and *šif<sup>ʿ</sup>el* 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 quadrilateral 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.<sup>49</sup> 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 *pilpel* pattern.

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

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49. B. Heine and T. Kuteva, *Language Contact and Grammatical Change* (Cambridge: Cambridge University, 2005).

## APPENDICES

Appendix 1: *Šif'el* 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	שדרג <i>šidreg</i> 'improve'	שכנע <i>šixnea</i> 'persuade' שקלט <i>šiqlet</i> 'automatically transcribe an audio recording'
2	שזרע <i>šizrea</i> 'reseed'	
3	שחבר <i>šihber</i> 'recompose'	
4	שחזר <i>šihzer</i> 'restore, reconstruct'	
5	שחלף <i>šihlef</i> 'replace again'	
6	שטען <i>ši'ten</i> 'recharge' (rare)	
7	שכפל <i>šixpel</i> 'copy, reproduce'	
8	שכתב <i>šixtev</i> 'rewrite'	
9	שנטע <i>šinṭea</i> 'replant'	
10	שנמד <i>šinmex</i> 'downgrade' (rare)	
11	שערך <i>ši'rex</i> 'revalue'	
12	שעתק <i>ši'teq</i> '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	במבם <i>bimbem</i> 'hum a tune using bim-bam sounds'	בקבק <i>biqbeq</i> 'bottle' התחנחן <i>hithanḥen</i> 'act coyly' לשליש <i>lišleš</i> 'produce guano' פנפן <i>finfen</i> 'have fun' (colloquial)
2	ברבר <i>birber</i> 'chat, jibber'	
3	ג'מג'ם <i>jimjem</i> 'improvise in music, jam' (colloquial)	



29	צִרְצֵר <i>širṣer</i> ‘chirp’	
30	קִוְקֵוּ <i>qivqev</i> ‘fill with lines, crosshatch’	
31	קִצְקֵץ <i>qiṣqeṣ</i> ‘prickle, itch’	
32	רִחְרַח <i>riḥreah</i> ‘sniff’	
33	רִפְרֵף <i>rifref</i> ‘rap’	
34	רִשְׁרֵשׁ <i>riṣreṣ</i> ‘run slowly moving foot by foot’	
35	רִשְׁרֵשׁ <i>rišreš</i> ‘rustle’	
36	תִּקְתֵּק <i>tiqteq</i> ‘tick’	

**Appendix 3: *Pi’el* Verbs Coined and Still Used in Modern Hebrew**

	<b>Verbs displaying the meaning of the pattern: a reduced or attenuated event</b>	<b>Verbs not displaying the meaning of the pattern</b>
1	אִוְשֵׁשׁ <i>ivšeš</i> ‘rustle (of wind)	אִוְרֵר <i>ivrer</i> ‘ventilate’
2	בִּשְׁלַל <i>bišlel</i> ‘cook briefly’ (rare)	אִנְפֵף <i>inpef</i> ‘speak through one’s nose’
3	גִּרְדַד <i>girded</i> ‘itch slightly’ (rare)	אִפְלַל <i>flel</i> ‘darken slightly’
4	דִּקְרַר <i>diqrer</i> ‘prickle’ (rare)	אִשְׁרַר <i>išrer</i> ‘ratify’
5	זִמְרַר <i>zimrer</i> ‘sing lightly’	הִתְגַּבְּנַן <i>hitgavnen</i> ‘became slightly bent’
6	לִחְשֵׁשׁ <i>liḥšeš</i> ‘whisper’	דִּבְלַל <i>divlel</i> ‘tatter’ (rare)
7	נִחְרַר <i>niḥrer</i> ‘snore lightly’ (rare)	דִּבְרַר <i>divrer</i> ‘act as spokesperson’
8	עִקְצֵץ <i>iqšeṣ</i> ‘prickle, itch’	זִרְגַּג <i>zirgeg</i> ‘ruin, have intercourse’ (rare) (colloquial)
9	צִוּחַח <i>šivḥeah</i> ‘squeal’ (rare)	חִרְטַט <i>ḥirteṭ</i> ‘talk or write nonsense’ (colloquial)
10	קִפְצֵץ <i>qifšeṣ</i> ‘hop’	כִּדְרַר <i>kidrer</i> ‘dribble (a ball)
11	רִקְדַד <i>riqded</i> ‘makes small dancing motions’ (rare)	כִּוּנַן <i>kivnen</i> ‘adjust’
12		לִחְטַט <i>liḥaṭeṭ</i> ‘perform circus tricks, perform in a dazzling manner’ (rare)

13	שרקק širqeq ‘whistle’	ליקק liyqeq ‘like (in the social media sense)’
14		מקסס miqses ‘mix (music)’
15		ניחסס niḥses ‘ruin the mood’ (rare) (colloquial)
16		סחרר siḥrer ‘spin’
17		סמרר simrer ‘give the shivers’
18		ספרר sifrer ‘number’
19		פקסס fiqses ‘fax’
20		פקשש fiqšeš ‘blunder’
21		התפרחה hitparḥeah ‘become a brat, behave like a brat’ (colloquial)
22		פרסס pirses ‘make a u-turn’ (colloquial)
23		צמרר šimrer ‘make s’o shudder’
24		צנרר šinrer ‘install pipes’
25		קוצ’ץ qivčeč ‘squeeze, squash’ (colloquial)
26		קרצץ qiršeš ‘nitpick, pester’
27		רפרר rifrer ‘reference’
28		שקלל šiqlel ‘adjust a calculation’