Specific Exceptions Driving Variation: the case of spirantization in Modern Hebrew

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Spirantization in Modern Hebrew has high levels of variation in its acquisition and production largely due to the high frequency of exceptions (Adam 2002). In this paper, we report the results of an experiment examining variation in the production of Modern Hebrew Spirantization (MHS) in real and nonce verb paradigms, linking the patterns of variation to specific exceptions that are encoded in the orthography.

Spirantization in Modern Hebrew is characterized by the alternation of the stops [p], [b], and [k] with [f], [v], and [χ], respectively. Fricatives generally occur in post-vocalic position and stops occur elsewhere. This alternation is especially noticeable in verbal paradigms where a specific segment within a root may occur in different syllable positions, as in (1).

(1) Spirantization distribution in Modern Hebrew

	Root	Infinitive	3rd Person Sg. Past.m.	Gloss
[f] ~ [p]	/**p**gʃ/	[li**f**goʃ]	[**p**agaʃ]	'meet'
[v] ~ [b]	/**b**gd/	[li**v**god]	[**b**agad]	'betray'
[χ] ~ [k]	/**k**tb/	[li**χ**tov]	[**k**atav]	'write'

However, there are exceptions to the distribution of spirantization in Modern Hebrew. Exceptional segments are non-alternating [p], [b], [k], which surface as stops in post-vocalic position, and [f], [v], [χ], which surface as fricatives in non-post-vocalic context, as in (2), often for historical reasons.

(2) Exceptions to spirantization in Modern Hebrew

	Root	Infinitive	3rd Person Sg. Past.m.	Gloss
/k/ (< *q)	/**k**rʔ/	[li**k**ro] (*liχro)	[**k**ara]	'read'
/v/ (< *w)	/**v**tr/	[le**v**ater]	[**v**iter] (*biter)	'give up'

In some cases, the difference between alternating and non-alternating segments is encoded orthographically. Namely, the exceptional labial fricative and both the exceptional velar fricative and stop are represented with a different grapheme than their alternating counterparts. The high frequency of exceptions to MHS in the modern lexicon has led to the acceptability of non-alternation in segments that ought to alternate (Adam 2002), as well as to a delay in the mastery of the language's phonological system – whereas cross-linguistically, phonological mastery is attained by the age of 6, Modern Hebrew speakers do not do so until the age of 12. Since conformity to spirantization is encoded in the orthography, it is suggested that the delay in phonological mastery may rely on literacy (Ravid 1995).

In a perception experiment, Temkin Martinez (2010) found that the segment's word position had a significant effect on the acceptance of variants of the segments, with the unexpected variant in post-consonantal position being more pervasive than variants in other positions (i.e. [lik**v**or], with a post-consonantal fricative was more likely thank [ka**b**ar] with a post-vocalic stop). Additionally, her rating task results showed that low levels of variation in exceptional forms are also acceptable, though at much lower rates than the alternating segments, which had not been attested previously, and is not typical for exceptions (Becker 2009).

In the current production study, 48 native speakers of Modern Hebrew participated in a sentence-completion task containing either real or nonce verbs. Each sentence was presented to participants aurally and contained a verb in the first part of the sentence. Participants were instructed to complete the second part of the sentence using the correct inflection for the verb they heard initially. Verbs were inflected so that the target segment's position would be different in the first and second sentences, as illustrated in (3).

(3) Sample target sentence

[dani	ohev	*levagel*	dvarim.	Amru	li	ʃeʔetmol	hu _____]
Danny	loves to	*NONCE*	things.	Told	to me	that yesterday	he _____

'Danny loves to NONCE things. I've been told that yesterday he_____'

In the case of nonce verbs, segments in the first instance of the verb were placed in a position that conformed with the distribution in (1) so that participants would find it ambiguous as to whether the segment was supposed to alternate. Therefore in (3), participants could perceive the [v] in [levagel] as alternating, opting to produce the expected [bigel] or variant [vigel], or they can perceive it an exceptional segment and opt to not alternate it, producing [vigel].

A total of 32 nonce verb roots and 44 real verb roots were used. In sentences containing nonce verbs, after completing the sentences verbally, participants were prompted to provide their perceived orthographic representation for the nonce root. This task aids in our ability to determine whether participants intended for the produced form to be the variant of the alternating or exceptional underlying forms. For example, in (3), the production of [vigel] paired with the orthographic representation for the alternating segment would indicate that the participant didn't alternate the segment but intended for it to be a variant of the alternating form.

Results show that variation patterns in the production of both real and nonce verbs matched those reported in Temkin Martinez (2010), with the highest variation present in post-consonantal position. However, unlike previous results, real verbs containing exceptional segments did not show a significant level of variation. In nonce verbs, when participants produced non-alternating segments, they preferred to use the orthographic representation correlating with exceptionality, but there were also high rates of use of the alternating segments, indicating significant levels of variation in alternation. Additionally, in nonce verbs, patterns indicate higher instances of non-alternation when the verb presented aurally contained a labial fricative or a velar, indicating that participants prefer to not alternate sounds that have a different orthographic representation for their exceptional and alternating iterations. These results indicate that preferences for non-alternation were affected not by the high frequency of exceptions to spirantization in general, but were most prevalent in the segments whose exceptionality was encoded in the orthography.

References:

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