I. Introduction – Modern Hebrew Spirantization

- Spirantization in Modern Hebrew verbal paradigms is characterized by the alternation of [p], [b], and [k] with their fricative counterparts [f], [v], and [χ], respectively. Fricatives generally occur in post-vocalic position and stops occur elsewhere.

(1) Spirantization distribution in Modern Hebrew

<table>
<thead>
<tr>
<th>Root</th>
<th>Infinitive</th>
<th>3rd Person Sg. Past.m.</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>[p]</td>
<td>/p[/q]</td>
<td>/lif[g/ʃ]</td>
<td>[pagaʃ]</td>
</tr>
<tr>
<td>[b]</td>
<td>/bgd/</td>
<td>/l[iv]god</td>
<td>[bagad]</td>
</tr>
<tr>
<td>[k]</td>
<td>/ktb/</td>
<td>/l[χ]tov</td>
<td>[katav]</td>
</tr>
</tbody>
</table>

Exceptionality

- There are exceptional segments, namely, non-alternating [p], [b], [k], [f], [v], and [χ], which may surface as stops in post-vocalic position or as fricatives elsewhere.
  - In older forms of Hebrew, these were underlying fricatives, emphatic stops and geminates, which did not undergo spirantization.
- In some cases, the difference between alternating and non-alternating segments is encoded orthographically.
  - Exceptional /k/ (<*q), /χ/ (<*h), and /v/ (<*w) have a different orthographic representation than alternating /k/ and /b/.

(2) Examples of exceptions to spirantization in Modern Hebrew (underlined)

<table>
<thead>
<tr>
<th>Root</th>
<th>Infinitive</th>
<th>3rd Person Sg. Past.m.</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/k/</td>
<td>(&lt;*q)</td>
<td>/liskro /*lexro</td>
<td>[kara]</td>
</tr>
<tr>
<td>/v/</td>
<td>(&lt;*w)</td>
<td>/levater</td>
<td>[viter] /*biter</td>
</tr>
</tbody>
</table>

Variation

- Variation has been reported in Modern Hebrew spirantization (Schwarzwald 1981, Adam 2002, Temkin Martínez 2010) and is characterized by segments that normally conform to the spirantization distribution (in (1)) surfacing as stops where fricatives are expected or as fricatives where stops are expected.

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1 No claim is being made here as to whether the UR of spirantized segments is a stop or fricative.
(3) Variation in Modern Hebrew spirantization

<table>
<thead>
<tr>
<th>Root</th>
<th>Expected</th>
<th>Acceptable Variant</th>
<th>Gloss</th>
</tr>
</thead>
<tbody>
<tr>
<td>/b/</td>
<td>/kbr/</td>
<td>[likbor]_</td>
<td>[likvor]</td>
</tr>
<tr>
<td>/k/</td>
<td>/ksh/</td>
<td>[jexase]</td>
<td>[jekase]</td>
</tr>
</tbody>
</table>

- Adam (2002) claims that this variation is driven by non-alternation.
  - Variation in alternating forms is seen as a "conflict [which] entails a competition between two grammars: one which allows alternation and one which blocks it."
- Temkin Martínez (2010) found that variation was rated as acceptable.
  - Although variation was deemed somewhat acceptable in exceptional segments, it was deemed more acceptable in alternating segments.
  - Variation was deemed more acceptable in post-consonantal position than in word-initial or post-vocalic positions.
  - No apparent preference for stops or fricatives.

II. Current Study – Production Experiment

Designed to examine whether speakers assume alternation or non-alternation when presented with novel verbs.

Methods

Participants
- Forty-eight native speakers of Modern Hebrew (19 males and 29 females), residing in Israel, participated in the study.
- Ages ranged from 22 to 46 years of age.
- Education levels ranged from high school diploma to master's degree.

Stimuli
- The stimuli contained both real and nonce verb roots.
- A total of 27 nonce roots were used in the experiment.
  - Roots contained the segments in question in root-initial and root-medial position.
  - Each root was conjugated into two tenses, requiring the segment to appear in two distinct word positions.
  - Filler nonce roots contained only sounds not affected by spirantization ([d], [r], [l], etc.).
- Each root was inflected in accordance with the spirantization distribution in (1), making it ambiguous as to whether the segment alternates.

(4) Sample inflections for nonce verbs

<table>
<thead>
<tr>
<th>Segment Pair</th>
<th>Root</th>
<th>Template 1 (pi’el)</th>
<th>Template 2 (pa’al)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Past</td>
<td>Infinitive</td>
</tr>
<tr>
<td>/k/χ</td>
<td>/krl/</td>
<td>[kirel]</td>
<td>[leχarel]</td>
</tr>
<tr>
<td>/b/v</td>
<td>/bgl/</td>
<td>[bigel]</td>
<td>[levagel]</td>
</tr>
</tbody>
</table>
- Target words were inserted into carrier sentence pairs.
  - Each pair contained a verb in the first sentence, but had it missing from the second sentence.
- Target sentences were recorded and presented to participants aurally.

(5) Sample target sentence

[dani ohev levagel dvarim. Amru li ?etmol hu_____]  
Danny loves to NONCE things. Told to me that yesterday he_____  
‘Danny loves to NONCE things. I’ve been told that yesterday he_____’

- The verbs were inflected so that the target segment’s position would be different in the first and second sentences.
  - Thus, participants’ realization of each target segment showed whether they perceived it as alternating or exceptional.
- Tokens were divided into two lists.
  - Each list contained two target forms of each of nonce verb.
    - The same inflection for Template 1 and Template 2 were used in the same list so that participants would not be primed to produce a certain form because it was previously heard.
  - Each list contained a total of 84 tokens.
  - Tokens were randomized within each list.

*Procedure*

- Participants were instructed to complete the sentence pairs using the appropriate inflection of the verb.
- After completing each sentence containing a nonce verb, participants were asked to write down the root for the verb.
  - Since alternation/non-alternation is encoded in the orthography, we could see whether participants’ non-alternation was a case of variation in alternating segments or if it was exceptionality.
Results

A. All Data

- Overall, there is no overwhelming preference for production of fricatives over stops.

(6) All segments: fricatives vs. stops

B. Word Position

- Within position, across all segments, patterns of preference match those in Temkin Martínez (2010):
  - Word-initial position = stops
  - Post-vocalic position = fricatives
  - Post-consonantal = fricatives

- Word-initial and post-vocalic positions follow spirantization distribution, but post-consonantal position does not.

(7) All segments: by word position
C. Segment preferences

- /p/ displays an opposite trend from /b/ and /k/:
  - Preference for stops in /p/.
  - Preference for fricatives in /b/ and /k/.

(8) Preference by segment

D. Within Segments

- /k/ behaves differently than /p/ and /b/ in word-initial and post-vocalic position.
  - Word-initial position: /k/ = fricatives, /p/ and /b/ = stops
  - Post-vocalic position: /k/ = stops, /p/ and /b/ = fricatives
- Opposite pattern in /p/ is driven by trends in post-consonantal position.
  - /p/ = stop
  - /b/ and /k/ = fricatives
- These trends are highly correlated to the orthographic representation of exceptional segments.
V. Future Directions

- Comparison of written responses to production patterns in nonce verbs.
- Analysis of real verbs used in production experiment as compared to Temkin Martínez (2010).
- Theoretical implications: Does this variation stem from a learnability problem?
- Production experiments with pre-literate children.
- Diachronic data – examine directionality of variation.
- Corpus study (CoSIH) to determine occurrences of variation in natural speech.

VI. Selected References


My talk handouts and publications are available for downloading on my Selected Works webpage: http://works.bepress.com/michal_martinez/