Exceptionality and Variation in Modern Hebrew Spirantization

[Keywords: phonology, segmental exceptions, variation, Stochastic OT]

This paper examines exceptionality and variation phenomena in Modern Hebrew spirantization, and pursues their theoretical implications.

In Modern Hebrew, due to degemination and some historical mergers, spirantization affects only /b/, /p/, and /k/. These stops alternate with their fricative counterparts in allophonic distribution, with fricatives occurring in postvocalic position and stops occurring elsewhere (Prince 1975, Malone 1993, Adam 2002). This is shown in (1).

However, there are some cases of underapplication where stops occur in postvocalic position, as in (2a). There are also cases of apparent overapplication of spirantization, where fricatives occur in word-initial position, as in (2b). This work focuses on the implications of instances of overapplication and underapplication for the theoretical treatment of exceptions.

The words in (3) contain both regularly-alternating and non-alternating stops/fricatives. These 'hybrid' forms reveal that exceptionality is not necessarily a characteristic of all segments in the word, unlike the predictions made by analyses that treat exceptions as rankings or properties associated with entire words (Itô and Mester 1999, Pater 2000, among others). The account proposed in this paper therefore encodes exceptionality at the segmental level.

For the exceptional segments, I propose an extension of the lexically-indexed constraints and set-based approach in Pater (2000) to the segmental level. In this analysis, segments indexed for different sets behave differently with respect to a given process. For the analysis presented in this paper, segments in Set 'A' are exceptional with regards to spirantization (as seen in (2)), and segments in Set 'B' are segments which participate in the spirantization distribution outlined in (1). Constraints may reference these sets, in which case they only apply to those segments which are indexed for the specified set. An example for this is seen in (5) where IDENT-IO[cont] is specified for either Set 'A' or 'B'. The constraints used in the analysis of spirantization include a contextual markedness constraint on post-vocalic stops (*V-STOP) as well as two context-free markedness constraints prohibiting stops (*STOP) and non-sibilant fricatives (*[+cont], [-sib]).

In addition to the cases of exceptions, there are also cases of attested variation in the regularly-alternating cases in (1). According to Adam (2002), variation in spirantization occurs in colloquial speech. Much like exceptions, this variation is instantiated with stops and fricatives occurring in contexts not predicted by the spirantization distribution in (1). Unlike the cases of exceptionality in (2), however, these are segments in forms that *do* normally participate in the distribution in (1). This variation occurs across speakers and registers. A sample of the variation seen in Adam (2002) is in (4). Further, new data on variation in spirantization in Modern Hebrew will be discussed based on a perceptual experiment with 26 subjects conducted by the author. The experiment results confirmed the existence of variation, with a preference for "expected" forms, i.e. ones obeying the spirantization distribution. Thus, variation was not free.

For the analysis of these cases of variation, I will be making use of stochastic constraints (Hayes & MacEachern 1998, Boersma 1998, Zuraw 2000, Boersma & Hayes 2001, Hayes 2004) which are capable of handling variation with a preference for one form over another. In the tableaux in (5), the stochastic ranking of the context-free markedness constraints allows for the correct probabilities of the winning candidate (55% for the expected form [likbor] and 45% for the variant form [likvor]). An alternative approach that treats exceptional segments using segmental prespecification (Inkelas, Orgun and Zoll 1997) is shown to be unsuccessful for Modern Hebrew, because it cannot capture the preference for expected forms in variation phenomena.

To allow for variation of those segments which normally participate in the spirantization distribution as well as for exceptionality, I combine the set-based approach with the use of stochastic OT in which probabilistic ranking based on lexical frequency is employed to account for the cases of variation.

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(1) Spirantization distribution in Modern Hebrew

root	3rd person sing. past	infinitive	
/**p**rs/	[paras]	[li**f**ros]	'to spread'
/**b**nh/	[bana]	[li**v**not]	'to build'
/**k**tb/	[katav]	[li**χ**tov]	'to write'

(2) Non-alternating stops and fricatives in MH

	root	3rd person sing. past	infinitive	
a.	/**k**br/	[**k**avar]	[li**k**bor]	'to bury'
	/s**p**r/	[si**p**er]	[lesa**p**er]	'to tell'
b.	/**f**ʃl/	[**f**iʃel]	[le**f**aʃel]	'to err'
	/**χ**lm/	[**χ**alam]	[la**χ**lom]	'to dream'

(3) Hybrid words containing both alternating and non-alternating segments in MH

/**kb**r/	[**k**a**v**ar]	'buried'	[li**kb**or]	'to bury'
/**bχ**r/	[**b**a**χ**ar]	'elected'	[li**vχ**or]	'to elect'
/**kp**r/	[**k**i**p**ur]	'atonement'	[le**χ**a**p**ɛr]	'to atone'

(4) Variation attested in Adam (2002)

Position	Expected (by SD in (1))	Acceptable Variant	Gloss
Word-initial	**p**izer	**f**izer	*'scattered'*
Post-consonantal	jik**b**or	jik**v**or	*'will bury'*
Post-vocalic	je**χ**ase	je**k**ase	*'will cover'*

(5) Sample tableaux for [likbor] (expected, 55% acceptance) ~ [likvor] (variant, 45% acceptance)

/$k_A b_B r$/ + inf. *'to bury'*	IDENT-IO$_A$[cont]	*V-STOP	*[+cont, -sib]	*STOP	IDENT-IO$_B$[cont]
☞ **a. lik$_A$b$_B$or**		*		**	
b. lix$_A$b$_B$or	*!		*	*	
c. lix$_A$v$_B$or	*!		**		*
d. lik$_A$v$_B$or		*	*!	*	*

/$k_A b_B r$/ + inf. *'to bury'*	IDENT-IO$_A$[cont]	*V-STOP	*STOP	*[+cont, -sib]	IDENT-IO$_B$[cont]
a. lik$_A$b$_B$or		*	**!		
b. lix$_A$b$_B$or	*!		*	*	
c. lix$_A$v$_B$or	*!			**	*
☞ **d. lik$_A$v$_B$or**		*	*	*	*

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