

THE ROLE OF SIMILARITY AND FREQUENCY IN INTER-PARADIGM LEVELLING

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The variation exhibited by a wide range of verbs in (spoken Israeli) Hebrew indicates an on going change (Bolzky 1980, Schwartzwald 1985). Examples are given in (1), where the first form in each pair is the old one.

(1)	<i>gerá</i>	~	<i>girá</i>	'to excite trans. 3 rd ms.sg. Past'	cf.	<i>nísá</i>	'to try'
	<i>tinák</i>	~	<i>tinók</i>	'to suckle 3 rd fm.sg. Future'	cf.	<i>tipól</i>	'to fall'
	<i>itmalé</i>	~	<i>itmalá</i>	'to fill intrans. 3 rd ms.sg. Past'	cf.	<i>itkasá</i>	'to cover intrans.'
	<i>jiśáx</i>	~	<i>jinśáx</i>	'to bite 3 rd ms.sg. Future'	cf.	<i>jigdál</i>	'to grow'

The change is analogical in nature (see rightmost column in (1)); *tinák* changes to *tinók* analogous to *tipól*, *gerá* to *girá* analogous to *nísá*, etc.

We present the following arguments:

- The change-oriented variation in (1) is due to the relative high degree of similarity between *whole* paradigms, rather than single forms within the paradigm;
- The direction of change is determined by the type frequency of paradigm-types, i.e. the number of verb paradigms hosted by a paradigm type.

In this context, we also highlight the distinction between *inter-* and *intra-*paradigm levelling, arguing for paradigm *migration* from one paradigm-type to another.

Similarity: The first question we address is: Why do some paradigms interact in the process of change and others do not. For example, why does *tinák* become like *tipól* and not like *tuxál* 'to be able 3rd fm.sg. Future'? Note that in either case the change involves one vowel only, and as shown in (2), proportional analogy (Saussure 1916, 1959) cannot tease them apart.

(2)	<i>3rd pr. fm.</i>			
	<i>Past</i>	<i>Future</i>		
	nafl-á	tipól	»	tinók 'to suckle'
	jank-á	tinák		tuxál 'to be able'
	jaxl-á	tuxál		

“Analogy is a relation of similarity” (Anttila 1972:88), and similarity is indeed the answer to the above question. However, we argue for similarity between *full-fledged paradigms*, rather than between pairs of words. That is, *tinák* becomes like *tipól* and not like *tuxál* because the whole paradigm of *tinák* is *more similar* to the whole paradigm of *tipól* than to the whole paradigm of *tuxál*. The paradigm, in the case of Hebrew finite verbs, consists of 16 forms (8 Past and 8 Future, 5 singular and 3 plural in each).

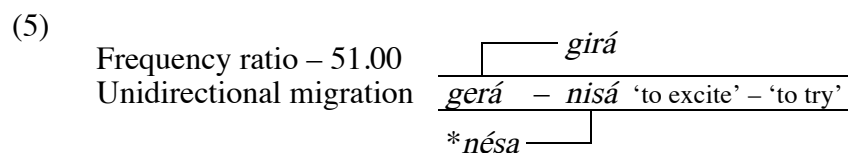
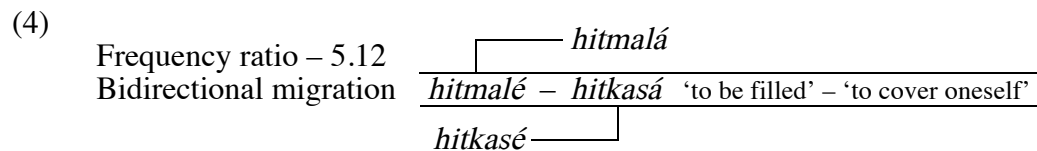
We also quantify the notion *more similar* using a simple model. After establishing the properties relevant for quantifying similarity (language specific to a certain extent), we compare all parallel pairs from paradigms A, B, and C and establish whether paradigm A is more similar to B or to C. Below is an example of one pair from each paradigm (out of the 16 pairs), where the relevant dissimilar units are summed up (Δ).

(3)	A	i t m a l	é	- j i t m a l é	'to fill intrans. Past-Future'
	B	i t k a s	á	- j i t k a s é	'to cover oneself Past-Future'
			1		$\Delta 1$
	A	i t m a l é	□	- j i t m a l é	
	C	i t l a b é	□	- j i t l a b é	'to dress oneself Past-Future'
			1		$\Delta 2$
	C	i t l a b	é □	- j i t l a b é	
	B	i t k a s	á □	- j i t k a s é	
			1 1		$\Delta 3$

Out of the three pairs in (3), paradigms A and B are the most similar (or the least dissimilar) and thus, other things being equal, A&B have a better chance to interact in the process of change than A&C and C&B.

Directionality: Establishing that paradigms A and B are the most similar, the next question is whether paradigm A will become like B or paradigm B will become like paradigm A? If we consider paradigms A and B as paradigm-types, where each is hosting one or more verb paradigms, we may speak in terms of verb paradigm *migration*. That is, a verb paradigm migrates from its original paradigm-type A to another paradigm-type B, and thus becomes identical to the verb paradigms in paradigm-type B.

We show that what determines directionality of migration is type frequency, i.e. the number of verb paradigms in a paradigm-type. If the frequency ratio between paradigm-types A and B is low, migration is bidirectional, as in (4), i.e. some verb paradigms migrate from A to B and others from B to A. If the frequency ratio between paradigm-types A and B is high, migration is unidirectional, as in (5), where verb paradigms from the low-frequency paradigm-type migrate to the high-frequency paradigm-type.



Unidirectional migration leads towards *inter*-paradigm levelling, i.e. loss of contrast and thus reduction in the number of paradigm-types. *Inter*-paradigm levelling differs from *intra*-paradigm levelling, where the latter leads to loss of contrast and thus reduction in the number of allomorphs *within* the paradigm. This distinction has not been relevant to cases like that of Latin (Saussure 1916, 1959, Kenstowicz 1996, Albright 2005), but for Hebrew it is crucial since paradigm migration does not lead to a reduction in the number of allomorphs within the paradigm (paradigm uniformity).

Bidirectional migration does not have such a positive effect since both paradigm-types are preserved and migration continues, sustaining variation. However, as the rate of migration is dependent upon the token frequency of the individual verb (such that the verbs with the highest token frequency are the last to migrate), it is possible that the two paradigm-types lose or gain members at unequal rates. It is, therefore, possible that the frequency ratio between the paradigm-types will grow until one paradigm-type becomes significantly larger than the other. When this happens, we expect the bidirectional migration to cease, and unidirectionality to take over.

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