

# Sub-optimal Paradigms in Yiddish

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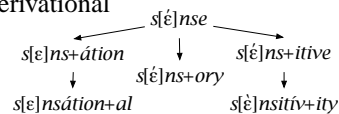
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## 1. Introduction

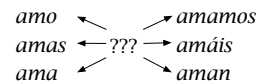
It is well known that the phonological form of a word can depend on its morphological structure. In serial approaches, this follows naturally from the fact that words have derivational histories: morphologically complex words undergo successive levels of phonology as they are constructed. A crucial distinction is typically made, however, between derivational and inflectional morphology. Whereas derived forms generally have clear “bases of affixation”, inflected forms are usually not obviously constructed from one another. For this reason, they do not have the same formal influence on one another.

### (1) Traditional inflectional/derivation distinction

#### a. Derivational

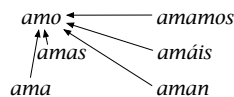


#### b. Inflectional

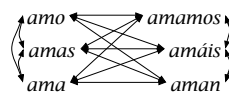


In a fully parallel model such as standard OT (Prince & Smolensky, 1993), morphological structure influences phonology not by stages of derivation, but by constraints on relations between forms—for example, via output-output (OO) constraints demanding identity to morphologically related forms (Burzio, 1996; Benua, 1997; Steriade, 2000; Kenstowicz, 2002). OO constraints are widely used in the literature, but there is no agreement as to evaluate them. Within derivational paradigms, it is clear that derived forms should be constrained to match their bases (Benua, 1997). In inflectional paradigms, however, there have been conflicting approaches. Some have argued that inflectional paradigms may also have privileged bases which the remaining forms must be faithful to (2a) (e.g., Benua, 1997; Kenstowicz, 1997), while others have assumed the more egalitarian structure in (2b).

### (2) a. Base Identity



### b. Uniform Exponence



\* This work has benefitted greatly from the helpful comments and suggestions of many people, including especially Bruce Hayes, Junko Itô, Armin Mester, Jaye Padgett, Donca Steriade, Michael Wagner, and audiences at MIT and WCCFL 23. All remaining errors and oversights are, of course, my own.

McCarthy’s “Optimal Paradigms” (OP) proposal aims to resolve the issue by codifying the distinction between inflection and derivation: derivational paradigms, which have intuitive bases of affixation, have a hierarchical structure as is traditionally assumed (2a), while inflectional paradigms have the democratic structure in (2b) (McCarthy, to appear, p. 5). McCarthy formulates OO constraints for inflectional paradigms (called OP constraints) such that every member of the paradigm must match every other member. No member of the paradigm is designated as a privileged base form (*ibid.*).

The OP hypothesis promises several advantages: first, it avoids the need to assign bases in inflectional paradigms, where there are often no obvious “derived from” relations. In addition, it yields strong and novel predictions. In particular, it predicts that if phonology affects one member of the paradigm, it may potentially spread to the rest of the paradigm (overapplication). The only way for phonology to underapply, spreading marked allomorphs, is if the language loses the process altogether. McCarthy dubs these predictions “overapplication only” and “attraction to the unmarked”.

To see why these predictions hold, consider the final devoicing example in (3). (I use FINDEVOI as a shorthand for the group of constraints motivating final devoicing—e.g., IDENT<sub>Pre-sonorant</sub>(voi)  $\gg$  \*VOIOBST (Steriade, 1997; Lombardi, 1999; Baković, 1999). When final devoicing applies without any additional OP effect (FINDEVOI  $\gg$  IO-IDENT(voi), OP-IDENT(voi) ranked low), the paradigm with voicing alternations wins (3a). When an OP effect is introduced (OP-IDENT(voi) ranked high), the paradigm with devoicing throughout is selected (3b); the OP constraint causes final devoicing to overapply, and the less marked allomorph to prevail. Crucially, the only way for candidate (c) (underapplication) to win is by reranking IO-IDENT  $\gg$  FINDEVOI—that is, by allowing voiced obstruents everywhere.

(3) A language with final devoicing:

a. No OP effect				
/bund/, /bund-ə/		FINDEVOI	IO-ID(voi)	OP-ID(voi)
☞ a.	[bunt], [bundə]		*	* (t~d)
b.	[bunt], [buntə]		**!	
c.	[bund], [bundə]	*!		
b. OP effect				
/bund/, /bund-ə/		OP-ID(voi)	FINDEVOI	IO-ID(voi)
a.	[bunt], [bundə]	* (t~d)		*
☞ b.	[bunt], [buntə]			**
c.	[bund], [bundə]		*	

The goal of this paper is to show that the overapplication-only prediction, though appealing in its strength, is false. The counterexample comes from a

change in the history of Yiddish, involving the “loss of final devoicing”. I will show that this change, of the *bunt*, *bunde*  $\Rightarrow$  *bund*, *bunde* type, was in fact paradigmatically motivated, and represents an example of underapplication and extension of marked forms. Although such a change is unexpected under the OP approach, it follows naturally from a theory in which inflectional paradigms also have bases, with the direction of leveling determined not by markedness or global harmony, but by which form in the paradigm serves as the base (in this case, the plural). Finally, I will sketch how the choice of base can be determined externally and non-circularly, using a procedure proposed in Albright (2002)—namely, by selecting the *maximally informative* member of the paradigm. I will show that this procedure correctly predicts the use of the plural as the base form in Yiddish.

## 2. Paradigm leveling in Yiddish nouns: Loss of final devoicing

### 2.1. Description of the change

Middle High German (MHG), the ancestor of Modern Yiddish, had a regular process of final devoicing (Paul, Wiehl & Grosse, 1989, §62)<sup>1</sup> This can be seen by comparing the forms in (4a), which exhibit voicing alternations, against the forms in (4b), which are voiceless throughout.

#### (4) Final devoicing in Middle High German

##### a. Voiced obstruents are devoiced in singular

	Stem	Nom. sg.	Gen. sg.	Nom. pl.	Gloss
/b/	lob-	lop	lobes	lobe	‘praise’
/d/	rad-	rat	rades	reder	‘wheel’
/g/	wëg-	wëc [k]	wëges	wëge	‘way’
	tag-	tac [k]	tages	tage	‘day’
/z/	hûs-	hûs [s]	hûses [z]	hiuser [z]	‘house’
/v/	briev-	brief	briefes	briefe	‘letter’

##### b. Voiceless obstruents throughout the paradigm

	Stem	Nom. sg.	Gen. sg.	Nom. pl.	Gloss
/t/	blat-	blat	blates	bleter	‘leaf’
/k/	druc-	druc	druckes	drucke	‘pressure’
/s/	sloz- [s]	sloz[s]	slozes [s]	sloze	‘lock’
/f/	schif-	schif	schiffes [f]	schiffe [f]	‘ship’

Early Yiddish also had final devoicing, seen in 13th-14th century spellings like *tak* ‘day’ (MHG *tac*), *vip* ‘wife’ (MHG *wîp*), etc. (King, 1980,

1. The MHG contrast is often thought to have involved aspiration, and only secondarily voicing; see Paul, Wiehl & Grosse (1989). Paul et al. note that although the alternation was nonetheless motivated by loss of voicing in syllable-final position.

p. 374). In Modern Northeast Yiddish (NEY), however, there is no general process of final devoicing (Sapir 1915, p. 237; Kiparsky 1968, p. 177; Vennemann 1972, pp. 188-189; Sadock 1973; King 1980).. Thus, words which showed alternations in MHG (4a) are consistently voiced in Modern NEY:<sup>2</sup>

(5) Modern NEY shows no final devoicing

	Stem	Sg.	Pl.	Gloss	cf:	MHG sg.
/b/	loyb-	loyb	loybən	‘praise’		lop
/d/	rɔd-	rɔd	reder	‘wheel’		rat
/g/	veg-	veg	vegən	‘way’		wēc
	tɔg-	tɔg	teg	‘day’		tac
/z/	hoyz-	hoyz	hoyzer	‘house’		hūs
/v/	briv-	briv	briv	‘letter’		brief

As King (1980, p. 383) states, “[g]enerally speaking NEY has restored phonetically a final voiced obstruent wherever MHG had a voiceless obstruent alternating morphophonemically with a voiced obstruent.” Words which were consistently voiceless in MHG (4b) remain so in NEY (*blat*, *druk*, *shlɔs*, *shif*), as do words with no paradigmatically related forms –e.g., *honik* ‘honey’ (no plural), *avek* ‘away’ (etymologically, but not paradigmatically related to *veg*).

How did words like (earlier) [vek] come to be pronounced as [veg]? One possibility is that the change was caused by blanket loss of final devoicing—that is, demotion of FINDEVOI. Under such an account, words like *veg* regained surface [g] simply because the relevant faithfulness constraint (IO-IDENT(voi)) was now above FINDEVOI. Words like *druk* and *avek* had no voiced allomorph in MHG, and thus had underlyingly voiceless final segments (due to the Alternation Condition, or Lexicon Optimization)—thus remaining voiceless even after the change. I will call this the “markedness demotion” account, since it is based on the idea that the only change in NEY was an increased tolerance of final voiced stops.

This can be contrasted with a paradigmatic account, in which the change of *vek* to *veg* was due to leveling of voicing from the plural to the singular, leading only secondarily to the demotion of FINDEVOI. Under this view, words like [vek] imported voicing from the plural and came to be pronounced as [veg]. Words like *druk* were voiceless in the plural, while words like *avek* had no plurals, and thus neither group was eligible to become voiced in NEY.

The markedness demotion and paradigmatic accounts are similar, since in both, the restoration of voicing is enabled by alternations. The difference

2. For Yiddish examples, I use YIVO transliteration (<http://www.yivoinstitute.org/yiddish/alefbeyts.htm>), with two minor modifications: I use the IPA symbol ɔ instead of YIVO *o* for *komets-aleph*, and I will use -ən instead of YIVO -en/-n for the infinitive/1pl/3pl suffix. For MHG forms, I use the standardized orthography of Paul, Wiehl & Grosse (1989, §§18–20), in which ^ marks length, ɐ is short open [e], and ʒ is a coronal sibilant fricative (Paul et al, §151).

is the mechanism: in the markedness demotion account, alternations provide evidence for URs, but the mechanism for change is increased tolerance for final voiced obstruents. In a paradigmatic account, learners fail to learn or stop tolerating alternations; the markedness consequences are secondary.

In fact, most treatments have assumed a paradigmatic explanation. In the first modern treatment of the change, Sapir (1915) hypothesized that leveling happened quite early in the history of NEY, and was followed by other changes affecting the shape of noun paradigms, such as final apocope and adding additional plural endings; this account, found also in Sadock (1973), is illustrated in (6). An alternate possibility, shown in (7), is that leveling was actually a later change, instigated by apocope, which rendered final devoicing opaque; this hypothesis was advanced by Kiparsky (1968, p. 177), and has been pursued by many subsequent authors (Vennemann 1972; King 1980).

(6) Early leveling from the plural

Stage 1:	MHG	Sg.	vek	Pl.	vegə
Stage 2:	Leveling of voicing		veg		vegə
Stage 3:	Apocope of final schwa		veg		veg
Stage 4:	Plural marking restored		veg		vegən

(7) Leveling induced by apocope

Stage 1:	MHG	Sg.	vek	Pl.	vegə
Stage 2:	Apocope of final schwa		vek		veg
	***Final devoicing is active, but counterfed by apocope				
Stage 3:	Leveling of voicing		veg		veg
Stage 4:	Plural marking restored		veg		vegən

Either way, the hypothesized leveling leads to underapplication of final devoicing, and creates more marked paradigms (a wider occurrence of voiced obstruents). Thus, if the traditional paradigmatic explanation is correct, the Yiddish change represents a counterexample to the “overapplication only” and “attraction to the unmarked” predictions of the OP hypothesis.

My goal in the following sections is to show that the paradigmatic account is indeed correct, and that the Yiddish change cannot be attributed to a simple loss of final devoicing. In particular, I will show that the “loss of final devoicing” did not introduce voicing contrasts in all positions, as might be expected from simple rule loss or markedness demotion. Even in modern NEY, coda voicing is contrastive only in places where there was paradigmatic pressure from the plural for voicing, while elsewhere, devoicing prevails.

## 2.2. Persistence of final devoicing in forms outside the paradigm

It is often emphasized that although final voicing was restored in noun paradigms, derivationally related forms continued to obey final devoicing;

some examples are shown in the last column of (8).

(8) Persistence of devoicing in derivationally related forms

Gloss	NEY sg.	pl.	Related to
‘way’	veg	vegn	avek ‘away’
‘enemy’	faynd	faynd	faynt hobən ‘hate’
‘friend’	fraynd	fraynd	(ge)fraynt ‘relatives’

The logic of the argument is that the relation between *veg* and *avek* was transparent enough to set up the UR /aveg/ (supported also by other pairs, such as *heym* ‘home’ ~ *aheym* ‘homewards’), but since ‘away’ is not part of the inflectional paradigm of ‘way’, it does not level, but continues to undergo final devoicing. If this is right, then it is strong evidence that the change from [vek] to [veg] was not purely phonotactic, but was due to paradigmatic pressure from the plural. An important caveat, however, is that the argument rests on the assumption that *avek* had not been relexicalized as /avek/ by the time of the change (making it immune from revoicing under any account). Thus, the argument from derivationally related words must be treated cautiously.

A stronger argument comes from the fact that although voicing contrasts were reintroduced at the ends of lexical roots, affixes went in the opposite direction, leveling to the *voiceless* variant. The MHG adjectival suffix *-ic, -ige* (with [k] ~ [g]) yielded NEY *-ik, -ike*, with [k] throughout—for example, the inflected forms of *lebedik* ‘lively’ include *lebedikə*, *lebedikən*, and *lebedikər*. Similarly, the MHG prefix *abe/ab/ap* yielded NEY *əp* in all positions (e.g., *əpesn* ‘eat up’), rather than restoring the voiced [b]. This is unexpected under the markedness demotion account, since these affixes had alternations, and thus must have had underlying voiced obstruents (/–ig/, /ab–/); a general loss of final devoicing should have allowed them to surface faithfully.

More generally, a survey of Katz (1987) reveals that Yiddish has no affixes with final voiced obstruents. This is a Richness of the Base problem (Smolensky, 1996); in principle, ranking IDENT-IO(voi) ≫ FINDEVOI should allow the possibility of a voicing contrast *anywhere*, including in affixes. It must be acknowledged that languages do not freely create/acquire new affixes, and furthermore, that the primary source languages for Yiddish have had final devoicing during much of the contact period. Nonetheless, it appears that the restoration of final voicing was blocked in the few cases where it should have applied (*\*-ig, \*ab-*), and that the change distinguished roots from affixes, perhaps via greater faithfulness to material in roots (Casali, 1997; Beckman, 1998; Alderete, 2001; Alderete, 2003): IDENT-IO<sub>LexCat</sub>(voi) ≫ FINDEVOI ≫ IDENT-IO(voi).

The “loss of final devoicing” was thus subject to a curious restriction: voicing was restored only in roots (perhaps only in noun and adjective roots, at that). Simply demoting FINDEVOI should have restored them everywhere.

### 2.3. Persistence of devoicing in word-final obstruent clusters

Another case in which devoicing persisted in NEY was in assimilation effects in clusters created by suffixation, as seen in the paradigm of the verb ‘to say’: [zɔg], [zɔkst], [zɔkt], [zɔgən], [zɔkt], [zɔgən] (Katz, 1987, p. 29).

How should we capture this devoicing? It is instructive to compare Yiddish with English and German. In English, there is no final devoicing, and the root controls the voicing of the suffix: *sacked* [sæk-t] vs. *sagged* [sæg-d]. This could be handled by a constraint against disagreeing sequences like \*[gt], \*[kd] (AGREE; Lombardi, 1999), combined with greater faithfulness to roots than to affixes (favoring /sæk-d/ → [sækt], not \*[sægd]). In German, on the other hand, the opposite pattern holds: the 3sg suffix is voiceless (-t), and root-final obstruents devoice to agree with the suffix (*packt* [pakt] ‘packs’, *sagt* [zakt] ‘says’). Superficially, it appears that the choice of [zakt] over \*[zagd] displays an unnatural preference to maintain suffix voicing over root voicing; however, the choice of [zakt] over \*[zagd] could also be attributed to the general process of final devoicing in German, which independently rules out \*[zagd].

Now compare NEY, which is putatively like English in lacking final devoicing, but is like German in fixing AGREE violations by regressive devoicing. In Yiddish, the incorrect form \*[zɔgd] cannot be ruled out by a general ban on final voiced obstruents. One possibility is to accept the ranking IDENT-IO<sub>Affix</sub>(voi) ≫ IDENT-IO<sub>LexCat</sub>(voi), counter to the usual claim that faithfulness for lexical categories universally outranks other types of faithfulness (Alderete, 2003; Smith, 2003). A more appealing possibility, which I adopt here, builds on the intuition that although Yiddish tolerates underlyingly voiced final obstruents to surface faithfully, it does not allow them to be created by voicing (/zɔg-t/ → \*[zɔgd], voicing the /t/). Baković (1999) proposes to handle such “grandfathering” effects with constraint conjunction—e.g., \*VOIOBST & IDENT(voi). This correctly derives the Yiddish pattern, as shown in (9).

(9) Analysis of regressive assimilation in suffixed forms

a. Underlying final voiced obstruents surface faithfully

/zɔg/	*VOIOBST & IDENT(voi)	AGREE	ID <sub>Lex</sub> (voi)	ID(voi)	*VOIOBST
a. [zɔg]					**
b. [zɔk]			*!	*	*

b. Voicing of underlyingly voiceless obstruents is blocked

/zɔg-t/	*VOIOBST & IDENT(voi)	AGREE	ID <sub>Lex</sub> (voi)	ID(voi)	*VOIOBST
a. [zɔgt]		*!			**
b. [zɔgd]	*!			*	***
c. [zɔkt]			*	*	*

The upshot is that the “loss of final devoicing” was subject to another odd restriction: why was final devoicing lost only for single obstruents, not for obstruent clusters? Straightforward demotion of the ban on voiced codas should have created a pattern more like English, rather than the complex pattern seen in NEY.

#### 2.4. Resistance to voicing in medial clusters

Further evidence that voiced obstruents are not freely allowed in codas in NEY comes from the way that voicing disagreements are resolved in medial clusters. According to the standard description, obstruent clusters are subject to regressive voicing assimilation, both within words and (to a lesser extent) across word boundaries: /vɔg + shəl/ → [vɔkshəl] ‘weight-scale’, /briv + treger/ → [briftreger] ‘letter carrier’, /kɔp + veytik/ → [kɔbveytik] ‘headache’ (Katz 1987, pp. 29-30; Lombardi 1999, p. 279).

In point of fact, regressive voicing is weaker and less frequent than regressive devoicing. Katz states: “[v]oiced consonants *usually* undergo devoicing,” but “[v]oiceless consonants *may* undergo voicing” (emphasis mine). He elaborates further: “Voicing assimilation [i.e., regressive voicing] is less consistent than devoicing assimilation, but it is frequently heard in natural speech.” Relatedly, King (1980, p. 387) notes: “My own impression is that a sound like the *t* in *halt zi* [dz] is not identical with the [d] in *vald* ‘forest’; rather, it is a semivoiced (or even voiceless) lenis.”<sup>3</sup> As with assimilation in suffixed forms, it appears that Yiddish shows some reluctance to create voiced coda obstruents.

In order to get a quantitative estimate of the asymmetry, I performed a study of Hebrew loans in Yiddish. Hebrew loans are a good test case, since they permit a large assortment of word-internal clusters, and they are not contaminated by bilingualism or influence of a native L1 phonology (since they were borrowed through texts, not living speakers). In addition Hebrew orthography is often opaque to Yiddish speakers, so loans are listed with romanized transcription (reflecting voicing agreement) in Weinreich’s (1968) dictionary. For example, a word written <bdkenen> in Hebrew letters is transcribed as [BATKENEN] ‘inspect (slaughter)’, whereas a nearby related word is listed as <bdikh> [BDIKE].

I compiled a database of all Hebrew words in Weinreich (1968) containing disagreeing obstruent clusters, along with their transcriptions. Multiple occurrences of the same root were removed, as were clusters involving [x] (since there is no romanization for [χ], thus no way to indicate voicing). The results show that all combinations are attested word-medially ((10)). However, as the graph in (11) shows, devoicing (on the right) is far more common

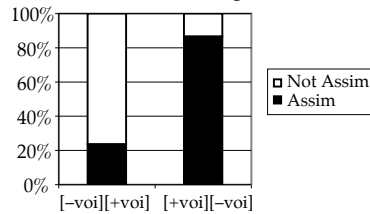
3. A similar pattern is found in Dutch, and is discussed by Jansen (2001).

than voicing, at least according to Weinreich's (NEY) intuitions:

(10) Obstruent clusters with and without assimilation

C1	C2	Pattern	Example		
[+voi]	[−voi]	Assim. No assim.	/plugte/ /kod <del>s</del> he/	[plukte] [kod <del>s</del> he]	'dispute' 'Holy of'
[−voi]	[+voi]	Assim. No assim.	/hek <del>d</del> esh/ /mak <del>d</del> im/	[hegdesh] [mak <del>d</del> im]	'poorhouse' 'ahead'

(11) Relative occurrence of regressive voicing and devoicing

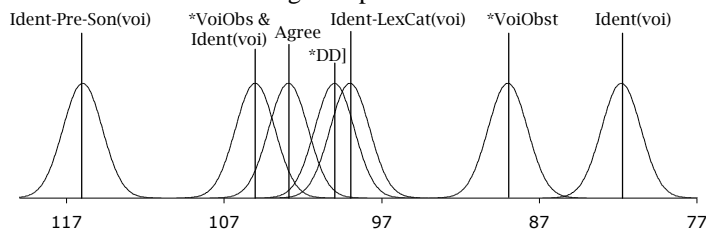


Although it is not a categorical effect, we see that even in Modern NEY, voiced obstruents are strongly dispreferred in coda (really, not pre-sonorant) position. As with the suffixed forms, we see that when they are present underlyingly, they may surface, but there is a strong tendency not to create them by voicing. This presents a third unusual restriction: if the loss of final devoicing was accomplished by demoting the ban on voiced codas, why is there this reluctance to create them root-internally?

## 2.5. Capturing this distribution with gradient constraint ranking

We have seen so far that voiced obstruents do not freely occur in codas in Modern NEY; rather, they are avoided in affixes, in final clusters, and, where possible, in medial clusters as well. A full analysis of these facts, including the detailed gradience, would be too long to include here; in the interest of concreteness, however, I sketch in (12) a ranking using the Gradual Learning Algorithm (GLA; Boersma & Hayes, 2001). This analysis shows a complex gradient interaction between specialized IDENT constraints and markedness constraints governing the distribution of voicing.

(12) Stochastic constraint ranking to capture these facts



The main point here is to observe that the “loss of final devoicing” did *not* yield a language that freely allows voicing in all positions. In fact, *even in the modern language*, there are only two places where voiced obstruents freely occur: (1) before sonorants, where they have always been possible, and (2) in root-final position, where there were paradigmatic alternations. The ranking in (12) is hardly a phonological simplification; the only thing that got simpler about Yiddish is that paradigms lack alternations, with modern forms preserving the voicing values previously seen only in the plural.

## 2.6. Further evidence for leveling from pl. → sg.

There is one other source of evidence that the restoration of voicing was due to paradigmatic pressure from the plural, and not merely a blanket markedness demotion: in addition to final voicing, vowel length was also imported from plural to singular.

In late MHG, a sound change lengthened vowels in open syllables (Paul, Wiehl & Grosse, 1989, §23)<sup>4</sup>. This created paradigmatic alternations such as [tak] ‘day (nom.sg.)’ ~ [ta:gə] (nom.pl.). In the development from MHG to NEY, short [a] remained [a] (seen in *makhən* ‘make’, *haltən* ‘hold’, *vartən* ‘wait’), while long [a:] became [ɔ] (*fərən* ‘travel’, *tsələn* ‘count’, *shlögən* ‘strike’). If MHG [tak] had survived into NEY with only the voicing restored, we would expect [tag]; in fact, the NEY form is [tɔg], with the reflex of a long [a:]. And, as Sapir (1915, p. 238) points out, the most plausible source for length in such words is by leveling from the plural.

Thus, we see that final obstruent voicing was not the only feature to be imported from the plural to the singular. If we attribute the loss of final devoicing to a voicing-specific markedness demotion, we have no account for the leveling of vowel length.

## 2.7. Summary of loss of final devoicing

We have seen so far that the outcome of nouns and adjectives in Modern NEY depended on the properties of their plural form. When there was a plural with a root-final voiced obstruent, this was “restored” to the singular (final devoicing *underapplied*)—e.g., sg. *veg* ‘way’ instead of expected *vek*. When the plural had a long vowel, that too was imported to the singular. When there was no paradigmatic pressure, the effects of final devoicing can still be seen in various ways through the reluctance to create voiceless codas.

This provides support for the idea that the Yiddish change was, at its root, a paradigmatic change. The result, however, was overall more marked

4. This is not the only possible formulation of lengthening in MHG; see Reis (1974) for an overview and critique.

paradigms, precisely of the type that OP predicts should never be favored: [bund], [bundə] in (3) above. Yiddish shows *attraction to the marked*, with final devoicing underapplying. It is a case in which the outcome of leveling is clearly determined not by markedness, but by the value of a particular paradigm member (the plural).

This is not the only case in which paradigms have apparently leveled to a particular slot in the paradigm, regardless of markedness; see, for example, Kraska-Szlenk (1995) on over- and underapplication of *jer* deletion in Polish diminutives, Sturgeon (2003) on over- and underapplication of depalatalization in Czech nouns, and Albright (2002) on leveling of vowel alternations in Yiddish verb paradigms. These cases pose a challenge to the OP architecture, and argue in favor of privileged bases within inflectional paradigms.

### 3. Analysis of the change using plural as the inflectional base

The problem with the OP approach is that the singular and plural get equal say in determining the outcome of the paradigm. This would be easily solved if, instead of an OP constraint, we used faithfulness to a pre-selected plural base form, by transderivational correspondence (Benua, 1997), or Base-Identity (Kenstowicz, 1997).<sup>5</sup>

(13) Plural form has no devoicing:

/bund-ə/ (pl.)	BASE-ID <sub>pl.</sub>	FINDEVOI	IO-ID(voi)
a. [bundə]			
b. [bunte]			*!

Singular form constrained to match plural:

/bund/ (sg.)	BASE-ID <sub>pl.</sub>	FINDEVOI	IO-ID(voi)
a. [bund]		*	
b. [bunt]	*!		*

This analysis rests on the assumption that the plural may serve as the base of noun paradigms. Such an assumption seems unappealing, since in this case the plural is suffixed, and can in no way be seen as the “base of affixation” for the singular. This raises numerous questions: can any form in the paradigm be designated as the base? If so, is there any rhyme or reason to which form serves as the base? In the next section, I show briefly how the use of the plural as a base form in Yiddish represents a principled choice, and

5. In actuality, the change was somewhat more complex than this, because of the opaque interaction of final devoicing and apocope. I have argued elsewhere that such levelings are not necessarily the result of OO constraints at all, but rather the result of how learners learn to project alternations, and how they assess the productivity of alternating and non-alternating patterns (Albright, To appear). For present purposes, the exact mechanism of leveling is not critical; all that matters is that it must refer to the plural as a privileged base form.

is correctly predicted by the base selection algorithm proposed in Albright (2002).

#### 4. Base forms as a language-particular choice

The use of the plural as a base form in Yiddish may be unusual, but it seems to serve a purpose. As Vennemann (1972, p. 189) notes: "...no contrasts are lost in the process ...:  $k/k : g/g$  is a better solution of  $k/k : k/g$  than  $k/k : k/k$  would have been. This seems to be true in general: Sound change neutralizes contrasts, analogy emphasizes contrasts by generalizing them." The intuition is that in this case, the plural is the form that most clearly exhibits lexical contrasts, and extended the plural variant would do the least violence to recoverability.

This idea is developed in detail in Albright (2002), in which it is proposed that bases are selected by language learners as part of a strategy to enable them to learn paradigms on the basis of incomplete information. The premise of this proposal is that learners must ideally be able to understand and produce whole paradigms of inflected forms, and in order to do this, they need to learn the morphological and phonological properties of each word. Not every part of the paradigm is equally informative, however, and learners do not have complete paradigms available to them. The hypothesis, then, is that learners identify the part of the paradigm with the most information, and focus on that form to learn the properties of words. (See Albright (2002) for details and algorithmic implementation.)

As applied to a stage of Yiddish prior to leveling, we can see that the plural most clearly displayed lexical contrasts. Most notably, it maintained the root-final voicing contrast for obstruents, which was neutralized in the singular.<sup>6</sup> In addition, it also revealed other unpredictable information, such as how the word pluralized. Although a complete computational simulation confirming this result is beyond the scope of this paper, it seems clear that the principles laid out in Albright (2002) would favor the plural as the base form in early Yiddish.

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6. We will never know whether final devoicing in early Yiddish was completely neutralizing, or whether the contrast was partly preserved through secondary cues, as has been argued for languages like Modern German (Fourakis, 1984; Port & O'Dell, 1986) or Catalan (Dinnsen & Charles-Luce, 1984)). In MHG and early Yiddish, devoicing was represented orthographically, raising the possibility that these languages were more like Modern Turkish, in which the neutralization is argued to be complete (Kopkalli, 1993). No matter whether the neutralization was complete or partial, however, it is undeniable that the singular afforded less evidence about stem final voicing than the plural did.

## 5. Conclusion

In this paper, I have presented several new arguments that the change known as the “loss of final devoicing” in early Yiddish was paradigmatically motivated, as traditional accounts have supposed. This change constitutes a counterexample to some key predictions of the Optimal Paradigms approach—namely, that leveling should always favor overapplication, and extension of less marked allomorphs. This is not a negative result, however. Such cases show that inflectional paradigms have more complex structure than is often supposed, and in particular, that they have privileged base forms, just like derivational paradigms. Furthermore, I have argued that the base form can be identified by independent procedures, as part of a separate learning algorithm that seeks to focus on the most informative parts of the paradigm. Thus, the proposed model actually represents a simplification, not a complication, in how output-output correspondence is computed in OT.

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