Natural class reasoning in segment deletion rules*

Kyle Gorman[1] and Charles Reiss[2]

[1]CUNY Graduate Center, New York
[2]Concordia University, Montréal

NELS 56, New York University

1 Introduction

- Logical Phonology (LP; e.g., Bale et al. 2014, Bale and Reiss 2018, Bale et al. 2020, Reiss 2021, Dabbous et al. 2024, Leduc et al. 2024, Reiss 2024, Gorman and Reiss 2025a,b, Kasenov 2025):
  - develops a formally rigorous definition of natural classes (§2.1), and
  - deconstructs the $\rightarrow$ of classical generative phonology into three novel operators (§2.2).
- Following these ideas to their logical conclusion has interesting but counterintuitive consequences for the analysis of segment deletion.

  (1) Delete The Rich (Reiss 2025): If some—but not all—X's delete in some phonological context Y __ Z, the X's that delete must be **more richly specified** than those which do not.

- After some preliminaries, we illustrate (1) using Hungarian *h*'s (§3) and Turkish *k*'s (§4).

2 Formal preliminaries

- Below we review the treatment of natural classes and rules in LP, noting that:
  - we put aside many details not relevant here, and
  - LP is itself a work in progress.

2.1 Features, segments, and natural classes

- We assume that UG provides a universal, innate, and finite feature set $\mathcal{F}$ (e.g., Chomsky and Halle 1965, Reiss and Volenec 2022).
- We further assume universal binary specification. Thus a *valued feature* is an element of $\{+, -\} \times \mathcal{F}$; e.g., +F, −G, etc.
- A *feature specification* is a (possibly empty) set of valued features; it must be *consistent*.

*We thank Péter Siptár for assistance with the Hungarian data.

(2) Consistency: If a segment is specified +F, it cannot also be specified −F, and vice versa.

- Feature specifications do not need to be *complete*: underspecification is permitted.[1]
- *Segments* are thus (consistent) feature specifications, linked to an X-slot.

(3) Sample segments:

$$/\text{i}/ = \begin{array}{c}\text{X}\\|\\ \left\{\begin{array}{c}+\textsc{Syllabic}\\ -\textsc{Back}\\ -\textsc{Round}\\ +\textsc{High}\\ -\textsc{Low}\\ +\textsc{ATR}\end{array}\right\}\end{array} \quad /\text{e}/ = \begin{array}{c}\text{X}\\|\\ \left\{\begin{array}{c}+\textsc{Syllabic}\\ -\textsc{Back}\\ -\textsc{Round}\\ -\textsc{High}\\ -\textsc{Low}\\ +\textsc{ATR}\end{array}\right\}\end{array} \quad /\text{I}/ = \begin{array}{c}\text{X}\\|\\ \left\{\begin{array}{c}+\textsc{Syllabic}\\ -\textsc{Back}\\ -\textsc{Round}\\ \square\textsc{High}^{a}\\ -\textsc{Low}\\ +\textsc{ATR}\end{array}\right\}\end{array}$$

[a] This □ symbol has no theoretical status; we are just drawing attention to /I/'s lack of specification for High.

- *Natural classes* are also defined by sets of valued features, but are interpreted as **sets of segments**: they match any segment whose specification is a *superset* of their specification (Bale et al. 2020).

(4) $\left[+\textsc{High}\right] = \left\{x : x \supseteq \left\{+\textsc{High}\right\}\right\} = \{\text{i}, \text{y}, \text{ɨ}, \text{ʉ}, \text{ɯ}, \text{u}, \ldots\}$

- For type consistency, we use curly braces for segments and square brackets for natural classes.
- We introduce one additional piece of notational shorthand, a circle used (with square brackets) to translate individual segments to natural classes.

(5) $\left[\textcircled{\text{i}}\right] = \left\{x : x \supseteq \{+\textsc{Syllabic}, -\textsc{Back}, -\textsc{Round}, +\textsc{High}, -\textsc{Low}, +\textsc{ATR}\}\right\} = \{\text{i}\}$

- We assume all rule targets and triggers (i.e., contexts or environments) are defined in terms of natural classes, though some natural classes, like (5), have a single-phoneme extension.
- One consequence of this definition—noted long ago (e.g., Lees 1961:12–14, Lightner 1971:236)—is that one cannot specify a natural class matching an underspecified segment, say /I/, without also matching any segment whose specification is a proper superset of that segment, say, /i, e/.

(6) $\left[\textcircled{\text{I}}\right] = \left\{x : x \supseteq \{+\textsc{Syllabic}, -\textsc{Back}, -\textsc{Round}, -\textsc{Low}, +\textsc{ATR}\}\right\} = \{\text{i}, \text{e}, \text{E}\}$

(7) Specificity: Let f, g be segments (feature specifications) such that $f \subset g$. Then there exists no natural class containing f but excluding g.

- As we'll see below, Delete The Rich follows directly from Specificity.

[1] Note that this is not itself a principle of LP; it is simply a stipulation that LP lacks. The LP model is thus formally simpler than models which adopt completeness, and thus forbid underspecification.

2.2 Rules

- LP decomposes the $\rightarrow$ of classical generative phonology into three novel operators.
- The *subtraction* operator $\setminus$, roughly set difference, removes valued features from a segment.

  (8) Subtraction: $A \setminus B = \{c\text{F} \mid c\text{F} \in A \wedge c\text{F} \notin B\}$

- The *unification* operator $\sqcup$, adapted from syntactic theory (e.g., Shieber 1986), adds a valued feature; it is vacuous if the target already has a specification for that feature.

  (9) Unification: $A \sqcup B = A \cup \{c\text{F} \mid c\text{F} \in B \wedge -c\text{F} \notin A\}$

- In other words, $A \sqcup B$ contains all features of A and all non-conflicting features of B.

  (10) Yield of unification:

  a. "Feature addition": $\left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\end{matrix}\right\} \sqcup \{-\textsc{High}\} \rightsquigarrow \left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\\-\textsc{High}\end{matrix}\right\}$

  b. "Vacuous application": $\left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\\-\textsc{High}\end{matrix}\right\} \sqcup \{-\textsc{High}\} \rightsquigarrow \left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\\-\textsc{High}\end{matrix}\right\}$

  c. "Unification failure": $\left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\\\underline{+\textsc{High}}\end{matrix}\right\} \sqcup \{\underline{-\textsc{High}}\} \rightsquigarrow \left\{\begin{matrix}-\textsc{Back}\\-\textsc{Round}\\\underline{+\textsc{High}}\end{matrix}\right\}$

- For both subtraction and unification, we assume:
  - the target is a natural class, appearing on the left-hand side,
  - the change is a feature specification, appearing on the right-hand side,
  - environments are optionally specified using natural classes.

  (11) Unification schema: $[\ldots] \sqcup \{\ldots\} \;/\; \ldots$

  (12) Subtraction schema: $[\ldots] \setminus \{\ldots\} \;/\; \ldots$

- Subtraction is used to implement processes like debuccalization (cf. autosegmental delinking; e.g., Benz and Volenec 2023) but there is nothing comparable in classical generative phonology.
- Unification is a novel solution to Specificity, i.e., the problem of targeting relatively underspecified segments. As shown in (10), it is non-vacuous only when the target is underspecified for the feature being added. Thus unification corresponds to so-called *feature-filling* processes.
- Furthermore, following prior suggestions (e.g., Poser 1982, Mester and Itô 1989, Inkelas and Cho 1993, Siptár and Törkenczy 2000), we decompose so-called *feature-changing* processes into a subtraction rule followed by a unification rule.[2]
- In contrast, prior approaches (e.g., Kiparsky 1985, Inkelas and Cho 1993, Buckley 1994, Inkelas 1995) use diacritics to distinguish feature-filling from feature-changing rules, whereas LP treats feature-filling as a primitive operation.

[2] Of course this does not exhaust the options. For example, Gorman and Reiss (2025b:§5) decompose a metaphony process in Cervera into a sequence of a unification, a subtraction, and three unifications.

(13) Russian final devoicing:

	nom.sg.	gen.sg.	
a.	t͡sv^{j}et	t͡sv^{j}eta	'color'
b.	prut	pruda	'pond'

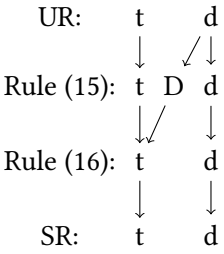
(14) Partial feature specification:

	/t/	/d/	/D/
Voice	−	+	
Sonorant	−	−	−

(15) $\left[-\textsc{Sonorant}\right] \setminus \left\{+\textsc{Voice}\right\} / \_\_ \%$

(16) $\left[-\textsc{Sonorant}\right] \sqcup \left\{-\textsc{Voice}\right\}$

(17) Segment mapping diagram:



(18) Yield of (16):

a. /D/ ⊔ {−Voice} ⇝ /t/
b. /d/ ⊔ {−Voice} ⇝ /d/
c. /t/ ⊔ {−Voice} ⇝ /t/

- Finally, the *segment* operator $\mapsto$, combined with a null symbol ϵ, implements insertion and deletion of full segments.[3]

(19) Insertion schema:

$$\begin{array}{c} X \\ | \\ \epsilon \mapsto \{\ldots\} \ / \ \ldots \end{array}$$

(20) Deletion schema:

$$\begin{array}{c} X \\ | \\ [\ldots] \mapsto \epsilon \ / \ \ldots \end{array}$$

- In insertion rules, the X is linked to a feature bundle and a specific segment is inserted.
- In deletion rules, however, the X is linked to a natural class and any segment matching the natural class is deleted, and thus the targets of deletion rules conform to Specificity.
- With unification rules, the Specificity effect is concealed by vacuous application and unification failure, but there is no such escape hatch for deletion rules.[4]
  - A unification rule of the form $\left[\textcircled{\text{I}}\right] \sqcup \left\{+\textsc{High}\right\}$ will apply non-vacuously only to /I/.
  - However, a deletion rule targeting [Ⓘ] both intensionally and extensionally targets /i, e, I/.
- Delete The Rich follows directly from our definitions, but runs contrary to a common intuition that less richly specified segments are "weaker" and thus are preferential targets for deletion (e.g., van Oostendorp 2003, Silverman 2011; see Reiss 2025 for discussion).
- We now use these tools to reanalyze cases of segment deletion with putative exceptions under the hypothesis that children acquiring language are *epistemically bounded* (in the sense of Fodor 1980:33f.) to analyze segments behaving differently in the same contexts as underlyingly distinct.

[3] Note that we do not model segment deletion via subtraction. Subtraction removes features, not segments, and we do not equate segmental underspecification with segmental absence.

[4] An anonymous reviewer asks whether one could decompose segment deletion into subtraction followed by deletion of the X. However, Delete The Rich entails the second rule—deleting only those X's linked to a null feature bundle—is unstatable in LP.

3 Hungarian *h*'s

- Some Hungarian *h*'s delete in coda position, but other *h*'s are realized as [x] in this position (all data from Siptár and Törkenczy 2000:§8.2.2, henceforth S&T).

(21)

	nom. sg.	abl. sg.	nom. pl.	
a.	t͡ʃɛ	t͡ʃɛ-tøːl	t͡ʃɛɦ-ɛk	'Czech'
	ju	ju-toːl	juɦ-ok	'sheep'
	meː	meː-tøːl	meːɦ-ɛk	'bee'
b.	dox	dox-toːl	doɦ-ok	'musty smell'
	ɛunux	ɛunux-toːl	ɛunuɦ-ok	'eunuch'
	meːx	meːx-tøːl	meːɦ-ɛk	'womb'

- S&T treats deletion in (21a) as exceptional—they write that it is "not phonological (anymore) and is best considered as suppletive allomorphy" (S&T:276)—and derive onset [ɦ] in (21b) from /x/.
- We hypothesize that roots showing the [ɦ]–zero alternation end in /h/ whereas those that show the [ɦ]–[x] alternation end in /H/, a segment underspecified for Consonantal (thus /H/ ⊂ /h/).

(22) Partial feature specification:

	/h/	[ɦ]	/H/	[x]
Consonantal	−	−		+
Dorsal				+
Voice	−	+	−	−

- The following deletion rule targets coda /h/; /H/ is unaffected.

(23) *h*-deletion:

$$\overset{\text{X}}{\underset{|}{\left[\textcircled{\text{h}}\right]}} \mapsto \epsilon \;/\; \_\!\_ \;]_\sigma$$

- Delete The Rich entails that the [h]–zero alternation cannot derive from /H/, because any rule which deletes coda /H/ must also delete coda /h/.
- The following rules derive the allophones of /H/. At this point of the derivation /H/ is the only segment not specified for the relevant features, so they can be stated broadly.

(24) $[\,] \sqcup \left\{ \begin{matrix} +\text{Consonantal} \\ +\text{Dorsal} \end{matrix} \right\} / \_\!\_ \,]_\sigma$

(25) $[\,] \sqcup \{-\text{Consonantal}\}$

- Finally, /h/—whether present underlyingly or derived from /H/ via (25)—is voiced to [ɦ] when between two vowels or between a sonorant and a vowel. This feature-changing process is implemented by subtraction followed by unification.

(26)
a.	/ʧʃɛh-Ek/	⇝	[ʧʃɛɦ-ɛk]	‘Czechs’
b.	/doH-Ek/	⇝	[doɦ-ok]	‘musty smells’
c.	/koɲhɔ/	⇝	[koɲɦɔ]	‘kitchen’

(27) $\left[\textcircled{\text{H}}\right] \setminus \{-\textsc{Voice}\} / [+\textsc{Sonorant}] \_\_ [+\textsc{Sonorant}]$

(28) $[\,] \sqcup \{+\textsc{Voice}\}$

(29) Critical orderings: (23) ≪ (24); (24) ≪ (25); (27) ≪ (28)

(30)
	‘Czech’	(abl. sg.)	(nom. pl.)	‘musty smell’	(abl. sg.)	(nom. pl.)
UR:	ʧʃɛh	ʧʃɛh-tO:l	ʧʃɛh-Ek	doH	doH-tO:l	doH-Ek
Harmony:		ʧʃɛhtø:l	ʧʃɛhɛk		doHto:l	doHok
Rule (23):	ʧʃɛ	ʧʃɛtø:l				
Rule (24):				dox	doxto:l	
Rule (25):						dohok
Rules (27–28):			ʧʃɛɦɛk			doɦok
SR:	ʧʃɛ	ʧʃɛtø:l	ʧʃɛɦɛk	dox	doxto:l	doɦok

- We are thus able to predict the full behavior of the two *h*’s within the narrow phonology, without recourse to the suppletion proposed by S&T.
- Confirmatory evidence for the proposed specification of /H/ comes from its behavior with respect to voice assimilation (Reiss 2021); see Appendix A for details.

4 Turkish *k*’s

- Some—but not all—Turkish *k*’s delete intervocalically (all data from Inkelas et al. 2000).[5]

[5]We set aside a few complexities for ease of exposition. A few nouns, all borrowings, end in a post-vocalic final [g], and most of these delete intervocalically, but we focus our attention root-final *k*’s, which are much more common. Inkelas and Orgun (1995:768) list vowel-initial suffixes, all belonging to a “Level 2” stratum, which never trigger *k*-deletion.

(31)

	nom. sg.	def. acc. sg.	1sg. poss.	
a.	konu<u>k</u>	konu-u	konu-<u>u</u>m	‘guest’
	tyfe<u>k</u>	tyfe-i	tyfe-<u>i</u>m	‘rifle’
b.	soka<u>k</u>	soka-ɯ	soka-<u>ɯ</u>m	‘street’
	tykyɾy<u>k</u>	tykyɾy-y	tykyɾy-<u>y</u>m	‘spit’
c.	hukuk	hukuk-u	hukuk-<u>u</u>m	‘law’
	meɾak	meɾak-ɯ	meɾak-<u>ɯ</u>m	‘curiosity’
d.	fiki<u>ɾ</u>	fikɾ-i	fikɾ-<u>i</u>m	‘idea’
	hyky<u>m</u>	hykm-y	hykm-<u>y</u>m	‘judgment’
e.	joɾum	joɾum-u	joɾum-<u>u</u>m	‘comment’
	sanat	sanat-ɯ	sanat-<u>ɯ</u>m	‘art’
f.	kedi	kedi-ji	kedi-m	‘cat’
	koʤa	koʤa-jɯ	koʤa-m	‘husband’

- The preservation of stem-internal *k* and deletion of stem-final *k* in (31b) suggests this pattern does not reflect morpheme-level exceptionality (cf. Inkelas et al. 1997:§4.2.1).
- The absence of deletion in (31cd) suggests this is not a traditional example of *non-derived environment blocking* (NDEB; cf. Inkelas 2000, 2009, 2014) either.
- Although Inkelas rejects “irregular” *k*-deletion as an NDEB effect, she also doubts the differential behavior of velars can be handled by the underspecification logic she and colleagues propose for feature-filling processes (e.g., Inkelas and Cho 1993, Kiparsky 1993, Buckley 1994, Inkelas 1995).

> Velar Deletion deletes whole segments. One might attempt various strategies for featural prespecification of nonalternating /k, g/ and underspecification of alternating /k, g/, but since the alternation itself is not featural, these attempts would be *far-fetched and uninsightful.* (Inkelas 2000:25, emphasis ours)

- Yet it is trivial to extend Delete The Rich reasoning we applied to Hungarian *h*’s to Turkish *k*’s: a *k* that deletes must be more richly specified than a *k* that does not.
- For concreteness, we hypothesize that non-deleting [k] is /K/, a segment underspecified for Dorsal, and deleting [k] is the fully specified /k/ (thus /K/ $\subset$ /k/).[6]
- The 1sg. poss. /-m/ triggers epenthesis of a harmonizing +High vowel after a stem-final consonant.[7]

(32) Epenthesis:

$$\epsilon \mapsto \begin{Bmatrix} \overset{\text{X}}{\mid} \\ +\textsc{Syllabic} \\ +\textsc{High} \end{Bmatrix} \; / \; \left[-\textsc{Syllabic}\right] \_\_ \left[-\textsc{Syllabic}\right] \; \%$$

- However, in (31ab), the epenthetic vowel also appears after a vowel that becomes stem-final due to velar deletion; thus epenthesis precedes—and is counterbled by—*k*-deletion.

[6] See Appendix B for a prosodic alternative.

[7] The paradigms of vowel-final stems in (32f) suggest this harmonic segment is epenthetic, not part of the suffix.

(33) *k*-deletion:

$$\overset{\text{X}}{\underset{|}{\left[\textcircled{\text{k}}\right]}} \mapsto \epsilon \;/\; \left[+\textsc{Syllabic}\right] \_\_ \left[+\textsc{Syllabic}\right]$$

- A final unification rule specifies the remaining /K/s as +Dorsal; other segments are unaffected.

(34) $\left[+\textsc{Consonantal}\right] \sqcup \left\{+\textsc{Dorsal}\right\}$

(35) Critical orderings: (32) ≪ Harmony, (33); (33) ≪ (34)

(36)

UR:	'street' soKak	'my street' soKak-m	'curiosity' meraK	'my curiosity' meraK-m
Rule (32) + Harmony:		soKakɯm		meraKɯm
Rule (33):		soKaɯm		
Rule (34):	sokak	sokaɯm	merak	merakɯm
SR:	sokak	sokaɯm	merak	merakɯm

- We are thus able to salvage a form of the underspecification analysis Inkelas saw little promise in.
- Under this analysis, /k/ does not occur intervocalically within roots, but the phonology of Turkish is such that there **cannot** be evidence for /k/ in this position (cf. Prince and Smolensky 1993:209).
- Inkelas and Orgun (1995), among others, claim that monosyllables do not undergo *k*-deletion; e.g., [kœk]–[kœkym] '(my) root'. They appeal to *ad hoc* notions—Bimoraic Minimality and Final Consonant Invisibility—to exempt velars in monosyllables from *k*-deletion.
- However, it turns out that there **are** monosyllables which **undergo** velar deletion. These analytically-challenging exceptions for Inkelas and Orgun pose no issues for our analysis.

(37)

	nom. sg.	1sg. poss.		
a.	t͡ʃok̲	t͡ʃo-um	'a lot'	
	gœk̲	gœ-ym	'sky'	
b.	brik̲	bri-im	'brik (Tunisian pastry)'	(UniMorph; Kirov et al. 2018)
	frak̲	fra-ɯm	'tailcoat'	
	plak̲	pla-ɯm	'vinyl record'	

(38)

UR:	'my root' kœK-m	'my sky' gœk-m
Rule (32) + Harmony:	kœKym	gœkym
Rule (33):		gœym
Rule (34):	kœkym	
SR:	kœkym	gœym

5 Conclusions

- Alternations affecting Hungarian *h*'s and Turkish *k*'s are located entirely within the narrow phonology, without reference to morphemic identity, morphemic exceptionality, or NDEB.
- LP principles like the admittance of underspecification, Specificity, and Delete The Rich follow from LP's minimal ontological commitments—specifically, traditional natural class reasoning made explicit—not stipulations of the theory.
- Delete The Rich may be counterintuitive, but it poses no empirical problems for LP.
- It remains to be seen whether all putative NDEB effects can be reanalyzed in a similar fashion.
- LP austerity is consonant with the pursuit of minimalist explanatory models in other sciences:

> The simpler the assumptions, the deeper the explanation. (N. Chomsky, "Fundamental Issues in Linguistics", 4/10/2019)[8]

Postscript

If you want to learn more about LP, attend the Workshop on Logical Phonology on Friday, January 23, 2026 at the CUNY Graduate Center.[9]

References

Bale, Alan, Maxime Papillon, and Charles Reiss. 2014. Targeting underspecified segments: a formal analysis of feature-changing and feature-filling rules. *Lingua* 148:240–253.

Bale, Alan, and Charles Reiss. 2018. *Phonology: A Formal Introduction.* MIT Press.

Bale, Alan, Charles Reiss, and David Ta-Chun Shen. 2020. Sets, rules and natural classes: {} vs. [ ]. *Loquens* 6:e06.

Benz, Johanna, and Veno Volenec. 2023. Two logical operations underlie all major types of segmental alternations. Paper presented at the 30th Manchester Phonology Meeting.

Buckley, Eugene. 1994. Prespecification of default features: The two /i/'s of Kashaya. In *NELS 24: Proceedings of Twenty-Fourth Annual Meeting of the North East Linguistic Society*, 17–30.

Chomsky, Noam, and Morris Halle. 1965. Some controversial questions in phonological theory. *Journal of Linguistics* 1:97–138.

Dabbous, Rim, Marjorie Leduc, Charles Reiss, and David Ta-Chun Shen. 2024. Locality is epiphenomenal: Adjacency is opaqueness. In *Actes du congrès annuel de l'Association canadienne de linguistique 2024 / Proceedings of the 2024 annual conference of the Canadian Linguistic Association.*

Fodor, Jerry. 1980. Reply to Putnam. In *Language and Learning: The Debate between Jean Piaget and Noam Chomsky*, ed. Massimo Piattelli-Palmarini, 325–334. Harvard University Press.

Gorman, Kyle, and Charles Reiss. 2025a. How not to acquire exchange processes in Logical Phonology. In *Actes du congrès annuel de l'Association canadienne de linguistique 2025 / Proceedings of the 2025 annual conference of the Canadian Linguistic Association*, in press.

Gorman, Kyle, and Charles Reiss. 2025b. Metaphony in Substance Free Logical Phonology. *Phonology* in press.

[8] https://youtu.be/r514RhgISv0?si=fbJ56Vo-R5oAHaRn&t=2940

[9] https://wellformedness.com/wolp/

Inkelas, Sharon. 1995. The consequences of optimization for underspecification. In *Proceedings of the North East Linguistic Society 25*, 287–302.

Inkelas, Sharon. 2000. Phonotactic blocking through structural immunity. In *Lexicon in Focus*, ed. Barbara Stiebels and Dieter Wunderlich, 7–40. De Gruyter.

Inkelas, Sharon. 2009. Another look at velar deletion in Turkish, with special attention to the derived environment condition. *UC Berkeley Phonology Lab Annual Report* 5:387–403.

Inkelas, Sharon. 2014. *The Interplay of Morphology and Phonology*. Oxford University Press.

Inkelas, Sharon, and Young-Mee Yu Cho. 1993. Inalterability as prespecification. *Language* 69:529–574.

Inkelas, Sharon, Aylin Küntay, C. Orhan Orgun, and Ronald Sprouse. 2000. Turkish Electronic Living Lexicon (TELL). *Turkic Languages* 4:253–275.

Inkelas, Sharon, and Cemil Orhan Orgun. 1995. Level ordering and economy in the lexical phonology of Turkish. *Language* 71:763–793.

Inkelas, Sharon, Orhan Orgun, and Cheryl Zoll. 1997. The implications of lexical exceptions for the nature of grammar. In *Derivations and Constraints in Phonology*, ed. Iggy Roca, 393–418. Oxford University Press.

Kasenov, Daniar. 2025. Polish /v/: Underspecified word-internally, specified word-externally. Paper presented at NAPhCxiii.

Kiparsky, Paul. 1985. Some consequences of Lexical Phonology. *Phonology Yearbook* 2:85–138.

Kiparsky, Paul. 1993. Blocking in non-derived enviroments. In *Studies in Lexical Phonology*, ed. Sharon Hargus and Ellen Kaisse, 277–313. Academic Press.

Kirov, Christo, Ryan Cotterell, John Sylak-Glassman, Géraldine Walther, Ekaterina Vylomova, Patrick Xia, …, and Mans Hulden. 2018. UniMorph 2.0: Universal morphology. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, 1868–1873.

Leduc, Marjorie, Charles Reiss, and Veno Volenec. 2024. Votic vowel harmony in Substance Free Logical Phonology. In *Oxford Handbook of Vowel Harmony*, ed. Harry van der Hulst and Nancy A. Ritter, 425–436. Oxford University Press.

Lees, Robert B. 1961. *The Phonology of Modern Standard Turkish*. Indiana University Publications.

Lightner, Theodore M. 1971. On Swadesh and Voegelin's 'A Problem in Phonological Alternation'. *International Journal of American Linguistics* 37:227–237.

Mester, Armin, and Junko Itô. 1989. Feature predictability and underspecification: Palatal prosody in Japanese mimetics. *Language* 65:258–293.

van Oostendorp, Marc. 2003. Schwa in phonological theory. In *The Second Glot International State-of-the-Article Book: The Latest in Linguistics*, ed. Lisa Cheng and Rint Sybesma, 431–461. De Gruyter Mouton.

Poser, William. 1982. Phonological representation and action at-a-distance. In *The Structural of Phonological Representations*, ed. Harry van der Hulst and Norval Smith, 121–58. Foris.

Prince, Alan, and Paul Smolensky. 1993. Optimality Theory: Constraint interaction in generative grammar. Technical report TR-2 and CU-CS-696-93. Published by MIT Press, 2004.

Reiss, Charles. 2021. Towards a complete Logical Phonology model of intrasegmental changes. *Glossa* 6:107.

Reiss, Charles. 2024. Specificity in rule targets and triggers: Two v's in Hungarian. In *Actes du congrès annuel de l'Association canadienne de linguistique 2024 / Proceedings of the 2024 annual conference of the Canadian Linguistic Association*.

Reiss, Charles. 2025. Delete the rich: On the non-existence of 'weak' schwa deletion. Ms. LOA-006. URL: `https://lingbuzz.net/lingbuzz/008747`.

Reiss, Charles, and Veno Volenec. 2022. Conquer primal fear: Phonological features are innate and substance free. *Canadian Journal of Linguistics* 67:581–610.
Shieber, Stuart. 1986. *An Introduction to Unification-Based Approaches to Grammar*. CSLI Publications.
Silverman, Daniel. 2011. Schwa. In *Blackwell Companion to Phonology*, ed. Marc van Oostendorp, Colin J. Ewen, Beth Hume, and Keren Rice, chapter 26. Wiley Online Library.
Siptár, Péter, and Miklós Törkenczy. 2000. *The Phonology of Hungarian.* Oxford University Press.

A Hungarian /H/ and voice assimilation

- Adjacent consonants undergo regressive voice assimilation.[10]

(39) Regressive voice assimilation (S&T:§4.1.1; Péter Siptár, p.c.):

	nom. sg.	abl. sg.	iness. sg.	all. sg.	
a.	kɔlɔp	kɔlɔp-to:l	kɔlɔb̲-bɔn	kɔlɔp-hoz	'hat'
	se:f	se:f-tø:l	se:v̲-bɛn	se:f-hɛz	'safe'
	re:s	re:s-tø:l	re:z̲-bɛn	re:s-hɛz	'part'
	ʒa:k	ʒa:k-to:l	ʒa:g̲-bɔn	ʒa:k-hoz	'sack'
b.	rɔb	rɔp̲-to:l	rɔb-bɔn	rɔp̲-hoz	'captive'
	ka:d	ka:t̲-to:l	ka:d-bɔn	ka:t̲-hoz	'bathtub'
	mɛlɛg	mɛlɛk̲-tø:l	mɛlɛg-bɛn	mɛlɛk̲-hɛz	'warmth'
c.	dox	dox-to:l	dox-bɔn	dox-xoz	'musty smell'
	me:x	me:x-tø:l	me:x-bɛn	méx-xez	'womb'

- /H/ shows a curious behavior with respect to voice assimilation:
  - It is not a **target** for voice assimilation; i.e., it is never realized as *[ɣ] in the iness. sg.
  - But it is a **trigger** of voice assimilation, devoicing preceding obstruents.
- /H/'s behaviors are predicted under the following assumptions:
  - /H/ is underspecified for Consonantal but is −Voice, à la (22).
  - /H/ is not targeted by voice assimilation because it is not +Consonantal.
  - /H/ s *catalytic* w.r.t. voice assimilation because the process is triggered by the presence of a Voice specification.
- Voice assimilation can thus be stated by the following rules (see Reiss 2021:§6.2):

(40) $\begin{bmatrix} -\textsc{Sonorant} \\ +\textsc{Consonantal} \end{bmatrix} \setminus \{\alpha\textsc{Voice}\} \; / \_\_ \begin{bmatrix} -\textsc{Sonorant} \\ -\alpha\textsc{Voice} \end{bmatrix}$

(41) $\begin{bmatrix} -\textsc{Sonorant} \end{bmatrix} \sqcup \{\alpha\textsc{Voice}\} \; / \_\_ \begin{bmatrix} -\textsc{Sonorant} \\ \alpha\textsc{Voice} \end{bmatrix}$

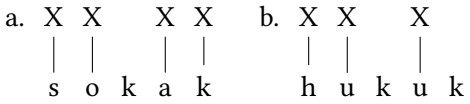
- One remaining question: what accounts for [xx] in the all. sg. in (39)?

[10] We set aside the complex behavior of *v* with respect to voice assimilation. Reiss (2021, 2024) uses a similar set of arguments to argue that Hungarian has two underlying sources for *v*.

B A prosodic alternative for Turkish *k*'s

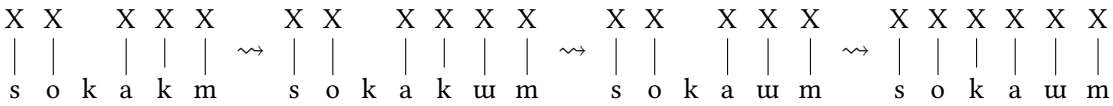
- We assume above that Turkish /K/ is underspecified for Dorsal, but alternatively, consider the possibility that non-deleting velars are prosodically underspecified.

(42) Schematic URs for 'street' and 'law':



- Then, (34) could be replaced by a rule or rules associating unassociated segments with X's.

(43) Schematic derivation of 'my street':



- Arguably this account is in the same spirit as Delete The Rich. Is there any reason to prefer prosodic over featural underspecification here?