The approach of tier-based strictly local (TSL) phonology has shown non-local processes locally over the tier. The strong tendency is to fit double vowel harmony on a single tier! Starring in this poster: Stony Brook University Alėna Aksėnova

To Achieve Harmony We Only Need One Tier

1 Subregular Phonology

For many decades it already was known that regular languages are enough to capture natural language phonological patterns [3], but recent results show that even less power is required: phonology subregular [1, 2]. Most phonological processes are strictly local and tier-based strictly local.

The Strictly Local (SL) grammar G consists of the alphabet Σ and the set of prohibited α-tiers E.

In German, /i/ is realized as [ɛ] in-between two vowels:
(1) Faßer → [faʃɚ] ‘father’ (2) reizen → [ɾjɪˈzɛn] ‘to travel’

Other consonants are unaffected:
(3) Wasser → [ˈwaːzɐ] ‘water’

The Tier-based Strictly Local (TSL) grammar G consists of the tier alphabet T and the set of prohibited α-tiers E over that tier, i.e. only tier elements of the original tier are projected on the tier, whereas non-tier items are ignored. This approach allows to analyze non-local processes locally over the tier.

2 Double Harmony In Kirghiz (Turkic)

The rule of the double vowel harmony in Kirghiz (Turkic) is to spread features of frontness and rounding simultaneously: all vowels within a word must agree in these two features, see the rule in (A1).

(A1) [consonantal / front / round] → [consonantal / front / round]  / [consonantal / front / round]...

Both harmonies affect the same set of vowels, all vowels undergo both spreadings, the set of transparent items is the same, therefore only one tier is required to capture Kirghiz pattern.

3 Double Harmony In Buyrят (Mongolian)

In Buyrят (Mongolian), all vowels within a word must agree in ATR. All tier-adjacent non-high vowels agree in rounding, unless there is an intervening high vowel that blocks this assimilation. Vowel /i/ is transparent for both harmonies. The rules in (B1-3) summarize this pattern.

(B1) [consonantal / time / tense] → [consonantal / time / tense]  / [consonantal / time / tense]...

One tier is sufficient only if the two harmonies operate over the same tier alphabet. If the alphabet differs (see [5] for examples of such consonantal harmonies), projection of more than one tier is necessary.

5 Rules For Fitting On The Same Tier

Two abstract harmonies A and B can fit on the same tier iff:
• The set of transparent items for the harmonies A and B is identical;
• Both blockers and undergoers for the harmony A play some role in the harmonic process B, i.e. they are either blockers or undergoers.

Conclusion

In this poster, I showed that the strong tendency, at least among double vowel harmonies, is to fit both harmonies on the same tier. This result is important both from typological and computational points of view because limiting vowel harmonies to one tier puts strong restriction on how such systems can look like, thereby providing the possibility for a new typological universal.

Questions to be answered:
• What about double consonantal harmonies (INDIAN TASHIHAYT, SLOVENIAN)?
• What about separate vowel and consonantal harmonies in the same language (KIKONGO, BURUNDI)?
• More generally, what are the natural language limitations on the choice of the tier alphabets?

References


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