The Almeida & Brown system

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This document describes the feature system of Almeida and Braun (1986) as it has been adapted by the authors of this document and implemented in LED-A.

Vowels

vowel=1, consonant=0, semivowel=0

adv	height	round
1=front, 2=central, 3=back	1=close, 2=between close and close-mid, 3=close-mid, 4=between close-mid and open-mid 5=open-mid 6=between open-mid and open-mid 7=open	0=not rounded 1=rounded

Consonants

vowel=0, consonant=1, semivowel=0

place	manner	voiced
1=bilabial 2=labiodental 3=dental 4=alveolar 5=postalveolar 6=retroflex 7=palatal 8=velar 9=uvular 10=pharyngeal 11=glottal	0=implosive 1=plosive 2=nasal 3=trill 4=tap or flap 5=fricative 6=lateral fricative 7=approximant 8=lateral approximant	0=not voiced 1=voiced

Semivowels

[i], [u]: vowel=1, consonant=0, semivowel=1
[j], [w]: vowel=0, consonant=1, semivowel=1
For semivowels both vowel and consonant feature values are given.

Silence

Used for insertions and deletions.

Vowel silence is defined as a schwa that is half rounded.

```
vowel      = 1
adv        = 2    (central)
height     = 4    (between close-mid and open-mid)
round      = 0.5  (half rounded)
```

Consonant silence is defined as a retroflex (place=6) and between 'tap or flap' and 'fricative' (manner=4.5) and half voiced (voice=0.5).

```
consonant = 1
place       = 6    (retroflex)
manner      = 4.5  (between 'tap or flap' and 'fricative')
voiced      = 0.5  (half voiced)
semivowel = 0
```

Segment distance calculation

pair	measure
vowel vs silence	vowel feature distance
consonant vs silence	consonant feature distance
vowel vs. vowel	vowel feature distance
consonant vs consonant	consonant feature distance
i vs. j, i vs. w, u vs. j, u vs. w	(vowel feature distance +
(if checked in the settings menu)	consonant feature distance)/2
vowel vs. semivowel	vowel feature distance
consonant vs semivowel	consonant feature distance

The vowel feature distance is calculated as the absolute sum of vowel feature value differences divided by the maximum vowel feature distance.

The consonant feature distance is calculated as the absolute sum of consonant feature value differences divided by the maximum consonant feature distance.

Scaling of segment distances

The segment distance are scaled so that vowel distances and consonant distances become more comparable to each other. In LED-A you can choose from two approaches.

A&B sub. ≤ 1 indel ≤ 0.5

This approach causes vowel substitutions and consonant substitutions be separately scaled between 0 and 1, and vowel indels and consonant indels be separately scaled between 0 and 0.5.

For scaling we need the maximum vowel substitution, the maximum vowel indel, the maximum consonant substitution and the maximum consonant indel. When finding these maxima only those segments are considered that are found in the data.

A&B cost ≤ 1

This approach causes vowel substitions and vowel indels together be scaled between 0 and 1, and consonant substitutions and consonant indels together be scaled between 0 and 1.

For scaling we need the maximum vowel distance (substitutions and indels are considered together) and the maximum consonant distance (substitutions and indels are considered together). When finding these maxima only those segments are considered that are found in the data.

Allowed matches

Basic rule: vowels may only match with vowels, consonants may only match with consonants.

The user can allow extra matches: [i], [u], [j], [w] may match with any segment
(When using 'Plain' or 'PMI' the user can also allow the [ə] and [ɐ] to match with any sonorant)

References

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