Phonetic Reduction in NNN Compounds: The Role of Boundary Strength

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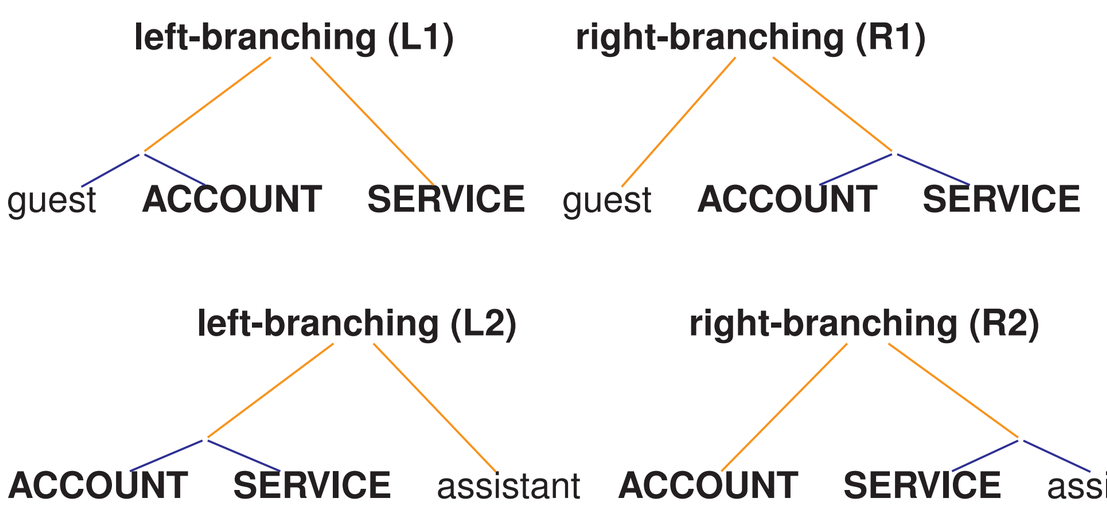
Does the morphological structure of NNN affect the acoustic signal in W1W2?

W1 = ACCOUNT, W2 = SERVICE



Method:
production experiment with 42 native speakers of North American English, 25 W1W2 pairs (***account service***) triggering 4 conditions:
42 x 25 x 4 = 4200 data points

W1W2 pairs: nasal + /t,d/ + fricative, or fricative + /t,d/ + nasal:
/nts/ (***account service***), /nds/ (***fund support***), /ntf/ (***tent fabric***), /stn/ (***quest narrative***), /stm/ (***activist movement***), /ftm/ (***shift managers***)

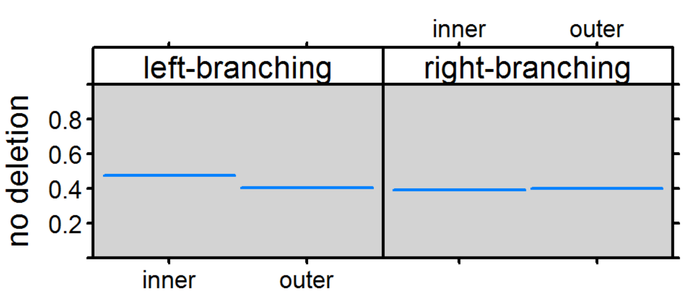
Lexical Phonology:
articulation cannot access the morphological structure of complex words (cf. Kiparsky 1982, Mohanan 1986)

Recent counter-evidence:
morphological structure of NNN compounds affects the acoustic signal (cf. Kunter & Plag 2016, Schebesta & Kunter (in prep.))

Embedded Reduction Hypthesis (Kunter & Plag):
In a complex word [X Y] Z,
the inner boundary between X and Y is weaker and therefore more prone to phonetic reduction than the outer and stronger boundary between Y and Z.

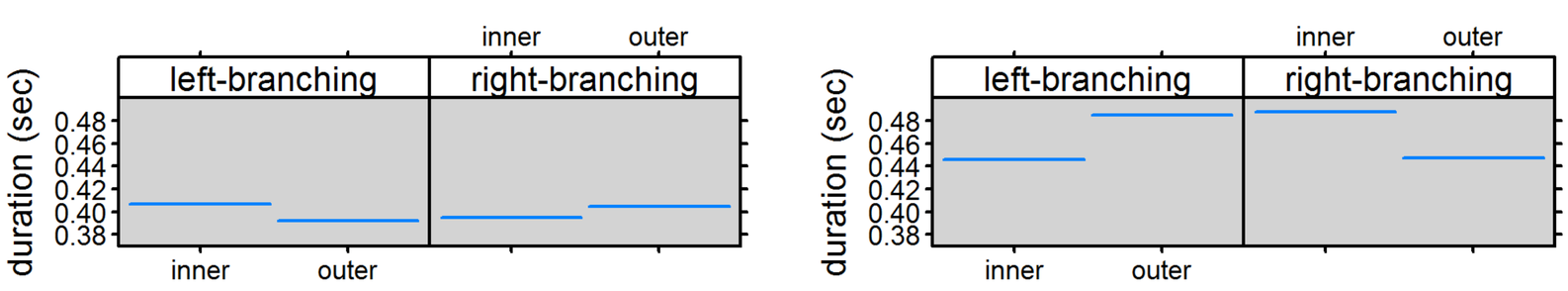
Predictions of the ERH:
1. There is less plosive deletion between W1 and W2 in L1 than in L2.
2. There is more plosive deletion between W1 and W2 in R1 than in R2.
3. W1 is longest in R2, because it is the free constituent.
4. W2 is longest in L1, because it is the free constituent.

Results: Plosive Deletion



Analysis Predictions 1 + 2:
logistic regression model (glmer),
dependent variable = plosive deletion
interaction = boundary * branching direction
Results:
less plosive deletion in left-branching inner boundary than outer boundary;
as much plosive deletion at right-branching inner boundary as at outer boundary.

Results: Acoustic Duration



Analysis Predictions 3 + 4:
linear regression model (lmer), dependent variable = acoustic W1/W2 duration, interaction = boundary * branching direction
Results Prediction 3:
W1: longer RB-outer (R2) than RB-inner (R1) & LB-outer (L1); RB-outer as long as LB-inner (L2).
Results Prediction 4:
W2: longer LB-outer (L1) than LB-inner (L2) & RB-outer (R2); LB-outer as long as RB-inner (R1).

Discussion & Conclusion

Prediction 1: not confirmed.
Prediction 2: not confirmed.
Prediction 3: not confirmed.
Prediction 4: not confirmed.

N3 is special: W2 in N3 positions longest irrespective of branching direction or type of boundary → final lengthening effect (cf. Turk & Shattuck-Hufnagel 2007)

Plosive deletion: Experiment design suitable for testing plosive deletion → deletion occurs; consonant sequences show expected tendency towards plosive deletion (cf. Tagliamonte & Temple 2005)

Embedded Reduction Hypothesis cannot account for majority of results:
- plosive deletion not connected to morphological boundary strength
- W1W2 behave independent from morphological structure
- W1W2 durations within embedded compound not predicted by ERH

Lexical Phonology cannot account for the results either: → acoustic differences of constituents within a compound exist
- W1 duration differs across branching directions and position within the compound
- W2 duration differs across branching directions and position within the compound
- W2 durations overall higher than W1 durations

References

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