Notational equivalence in tonal geometry

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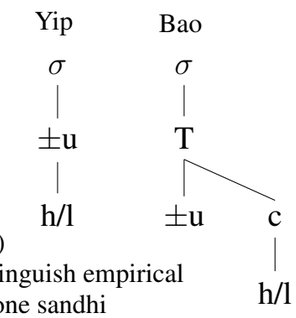
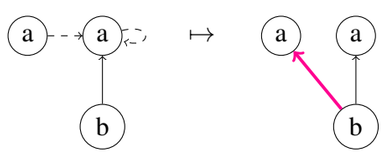
Overview

- Two competing feature geometric models of tone are **notationally equivalent**
  - do not differ in their empirical predictions
  - structural differences are superficial
- **Method**: Model-theoretic analysis (Enderton, 2001; Courcelle, 1994) of models using mappings between graph structures.
- **Target of study**:
  - Yip (1989) and Bao (1990)
  - differences claimed to distinguish empirical coverage of assimilatory tone sandhi
  - formalized as *spreading* (**H1**)

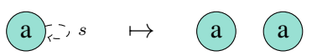


Graph mappings

- Models as graph **structures**
  - *nodes* labeled with features (σ, $\pm$u, etc.)
  - connected by *edges* (association, dominance, linear order; **H2**)
- Input/output graph **mappings**
  - determine output structure using *local, input substructures*
  - Ex: **local spreading** using connected substructures



- Two **hypotheses** about complexity (**H3**)
  - size-preserving mappings (no copying)
  - non-size-preserving mappings (copying allowed)

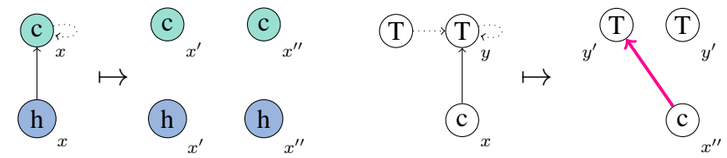


  - still restricted by *locality* requirement
- Non-size-preserving mappings needed to model full range of assimilatory tone sandhi over *both* models

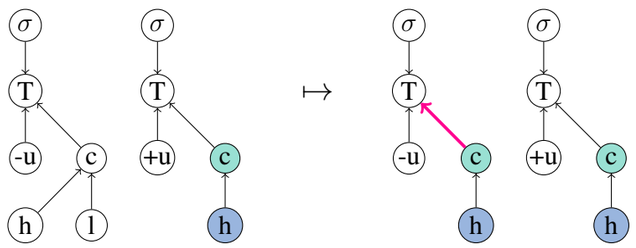
Empirical predictions

- **Claimed cases**: contour assimilation in Zhenjiang (**H4**) and register assimilation in Pingyao (**H5**)

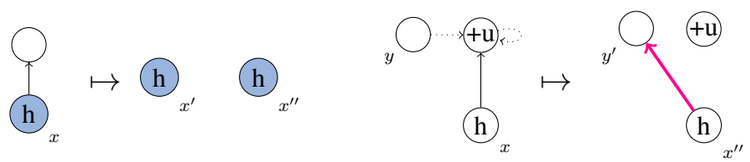
Zhenjiang: penult syllable adopts *contour* of following syllable
Bao: 2 copies of final **c**/**h**, edge b/t penult T and input *successor*
Local substructures:



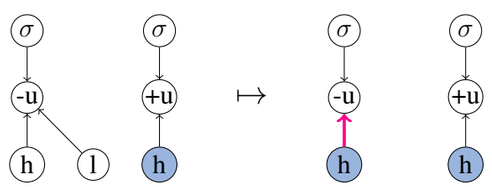
Full mapping:



Yip: 2 copies of final **h**, edge b/t penult T and input *successor*
Local substructures:



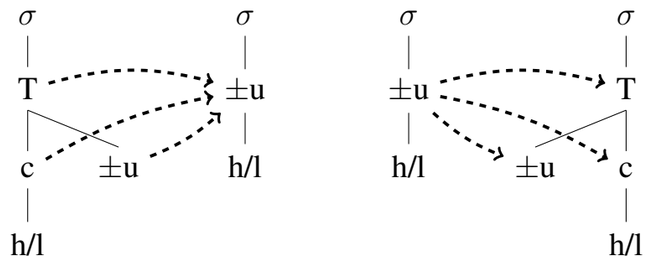
Full mapping:



- **Result**: Yip's model *can* model this process; both require copying

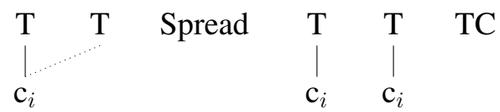
Structural differences

- Bi-interpretability (Friedman and Visser, 2014)
  - intertranslatability (**H6**)
  - contrast-preservation (**H7**)



Discussion

- (Non)-size-preserving mappings correspond to autosegmental theories w/(out) copying
- **Tier conflation** (TC) and necessity for tone sandhi representation



- More *restrictive* definition of bi-interpretability than earlier studies (Danis and Jardine, 2018; Strother-Garcia and Heinz, 2017)
- Address Zhang (2014)'s sentiment that representational work is at a standstill
  - Re-examine hypothesis space
- Reason over empirical predictions and structural differences using *single formalism*

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