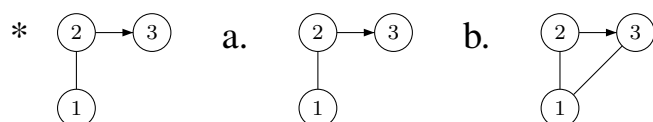


Overview

- Many markedness constraints identify illicit **substructures** of a representation

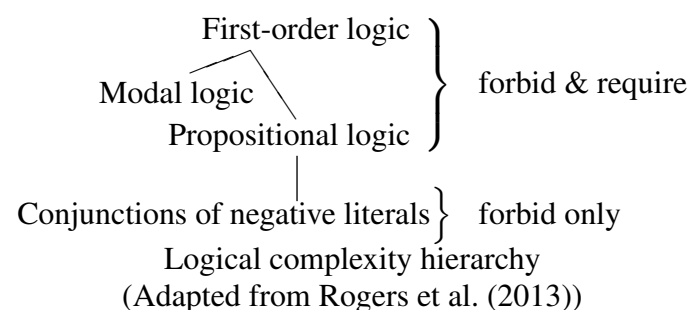
Ex., *NC, *CODA, *[voice]



- The **superstructure problem**: a pattern in which a well-formed structure is a **superstructure** of an ill-formed one (Jardine and Heinz, in press; Jardine, 2016; Danis, 2017)
- We propose a strong (and mathematically natural) definition of substructure from **logic** and **model theory** that can capture these cases in a unified way and maintains a restrictive, **negative** conception of markedness

Negative Markedness

- From a logical perspective, the most restrictive constraints can only **forbid substructures** (Jardine and Heinz, in press)



- Example of first-order:

$\forall x, \exists y [+nasal](x) \rightarrow [-voice](y)$
“If there is a nasal, there must be a voiceless segment (somewhere in the word)”

- Example negative (string) literal:

$\neg *NC$
“Don’t contain a *NC sequence”

The Superstructure Problem

- Given non-linear representations, some constraints appear to **require** structure

- Aghem** (Hyman, 2014)

- When H tone is followed by L, it spreads to the right:
 - /é - nòm/ → [é - nòm] ‘to be hot’
 - /fú - kía/ → [fú - kía] ‘your sg. rat’
 - e-nom → e-nom [é - nòm] ‘to be hot’



- Constraint: “H must spread to a following L-toned mora”
- The well-formed structure includes the ill-formed structure



- CODACOND** (Ito 1986, Ito and Mester, 1994)



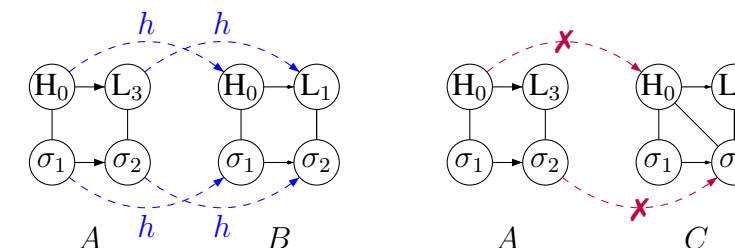
- Other examples:

- Ngbaka cooccurrence restrictions on complex consonants (Sagey 1986, Danis 2017)
- Spreading in Tingrinya and other languages (Hayes 1986)

Defining Substructure

- Substructure**: For two structures A and B in \mathcal{S} , A is a substructure of B iff there is a **mapping** h from D^A to D^B such that
 - for every unary relation R_i , $d^A \in R_i$ in A **iff** $h(d^A) \in R_i$ in B , and
 - for every **binary relation** R_j , $(d_1^A, d_2^A) \in R_j$ in A **iff** $(h(d_1^A), h(d_2^A)) \in R_j$ in B
- This definition is standard in logic and model theory (Libkin, 2004)
- This **strong definition** differs from earlier (for phonology) **weak definition**, which uses **if** instead (Hayes, 1986; Jardine and Heinz, in press; Jardine, 2017)

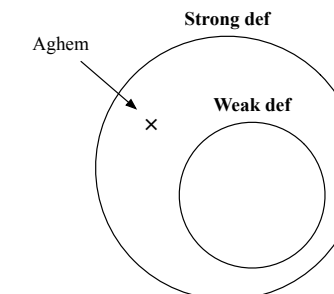
Aghem Tone Spreading



- The mapping h from A to B satisfies the definition, but there is no such mapping from A to C
- Thus, B is not grammatical for Aghem, but C is.

Discussion

- The strong definition is more expressive than the weak, but still **negative**
- Constraints like SPEC-T (“Syllables must be specified for tone”; Yip, 2002)) are different; they warrant further study
- The right formal definitions of markedness and representations can unify distinct phenomena.



Acknowledgements & References

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