Modeling gradient acceptability of left-peripheral movement

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Main claim

My claim

It is useful to model obligatory/optional/illicit (left-peripheral) movement in terms of **numerical costs** associated with violations of grammatical principles.

$\rightarrow$ This allows to derive **precise predictions** that can be tested against gradient judgment data.

Example: object-initial sentences in German

(Toy) example: object-initial sentences in German

Observation:
Object-initial sentences often show degraded acceptability in German.

Hypothesis:
The movement operation is fully optional, but interface problems can emerge.

Example for illustration:
One particular realization: sentence stress on fronted object, broad focus.

[$\underline{S}$ $\underline{\underline{O}}$ V]$_{focus}$:   unproblematic canonical order

[$\underline{\underline{O}}$ V S]$_{focus}$:   violates preference to stress a new phrase (S)

                + violates preference for rightward sentence stress

single underlining = prominence at the level of the phonological phrase
double underlining = prominence at the level of the intonation phrase

Towards precise acceptability predictions: numerical costs

The predictions of the hypothesis can be made more precise by associating each violation of a grammatical principle (be it interface- or syntax-related) with a cost (following the basic idea of Linear Optimality Theory, Keller 2000).

Example

principle	violation cost
1. a discourse-new phrase is stressed	?
2. sentence stress falls to the right	?

Towards precise acceptability predictions: numerical costs

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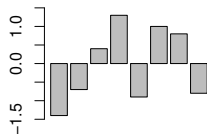
Example

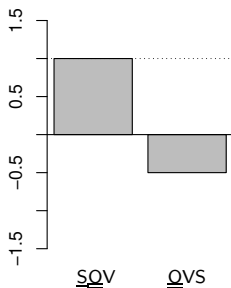| principle	violation cost
1. a discourse-new phrase is stressed	0.2 (in terms of z-scores)
2. sentence stress falls to the right	0.5 (in terms of z-scores)

The costs can be estimated based on a data set of acceptability judgments.

(hypothetical values for the ease of illustration)

Testing the hypothesis against gradient data

Can the independently estimated violation costs for the interface-related problems fully explain the acceptability differences in the crucial conditions?
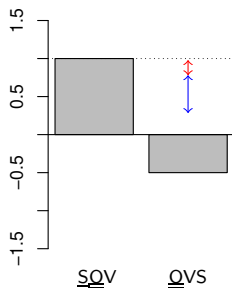

↕ independent estimate for violation cost of principle 1

↕ independent estimate for violation cost of principle 2

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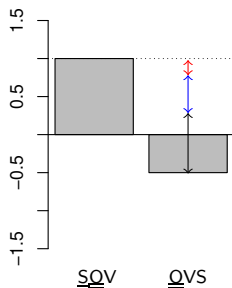

$\updownarrow$ independent estimate for violation cost of principle 1

$\updownarrow$ independent estimate for violation cost of principle 2

$\updownarrow$ unexplained part of acceptability difference
(could correspond to the cost of
a non-minimal fronting operation)

The proposed model is related to the idea that costly operations need to be motivated by a benefit at the interfaces (Reinhart 2006). It allows to express costs and benefits in precise terms.

Modeling obligatory / optional / illicit movement

Obligatory movement:

costs of structure with movement $<$ costs of structure without movement

Optional movement:

costs of structure with movement $=$ costs of structure without movement

Illicit movement:

costs of structure with movement $>$ costs of structure without movement

Advantages

Benefits of a model with gradient costs:

- It allows **precise testing** of theoretical models, and to make use of the information offered by gradient data efficiently.
- It helps to **see through complex data patterns** in which many factors influence acceptability.

  See Wierzba (forthcoming) for a modeling study on a data set with object-initial structures in German, and Šimík & Wierzba (2017) for a study on West-Slavic.

Thank you for your attention!

References:

Keller, Frank. 2000. Gradience in grammar. PhD thesis, University of Edinburgh.
Reinhart, Tanya. 2006. Interface strategies. Optimal and costly operations. MIT Press.
Šimík, Radek, and Marta Wierzba. 2017. Modeling the impact of prosodic and word order factors. Language 93:3.
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