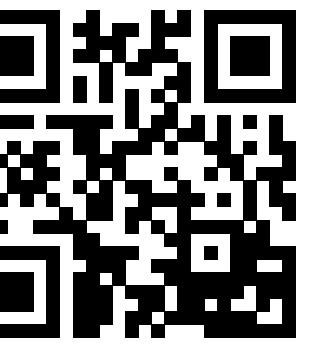


The trace of categorical structure in gradient judgments

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Goal

Statistical comparison of gradient and categorical models of grammar
Case study: island effects

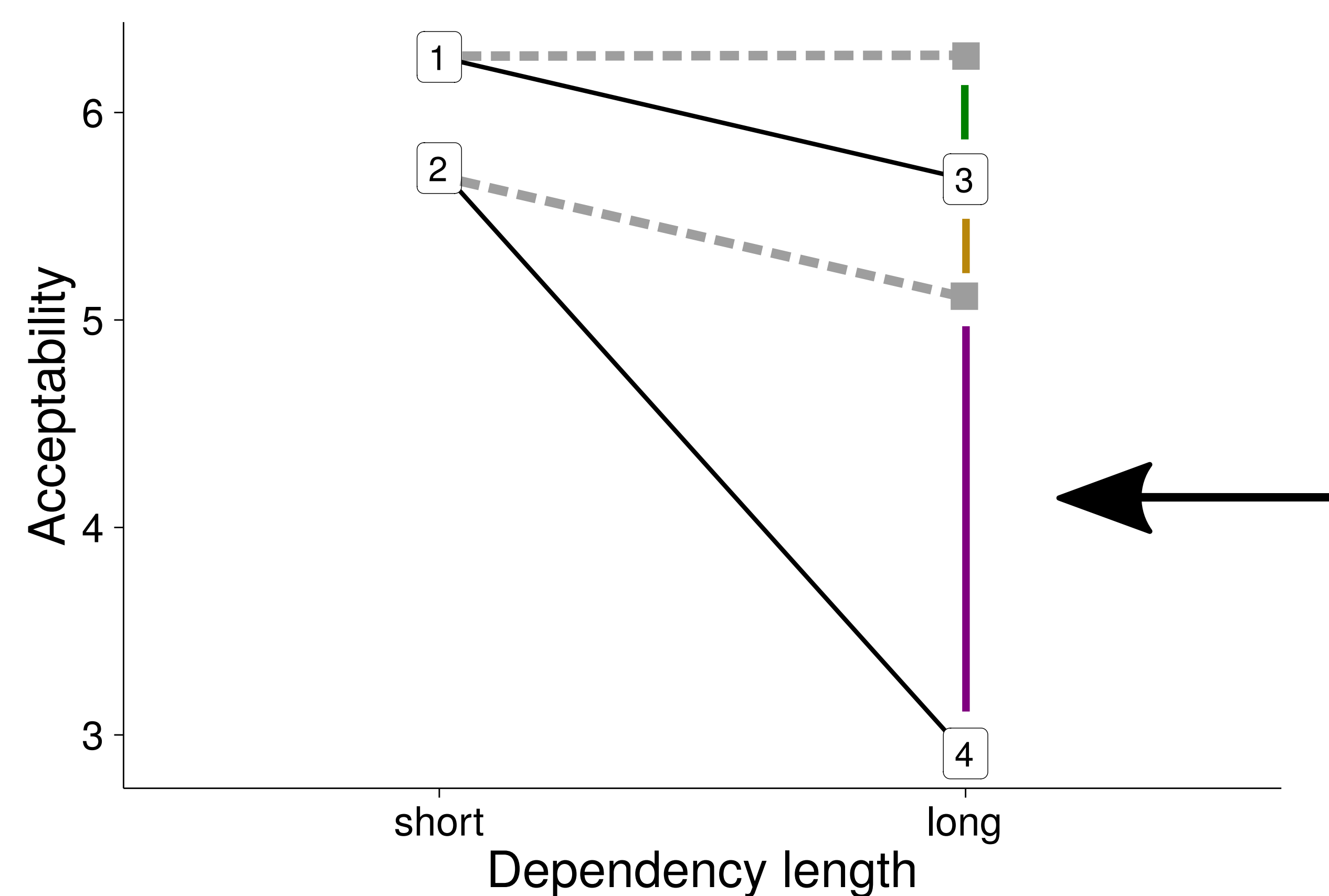
Finding

Controlling for processing/task effects, simple categorical grammar models outperform gradient grammar models

Preliminaries

Acceptability judgments display gradience
does not imply
grammars are gradient

1. Who _ thinks that John bought a car?
2. Who _ wonders whether John bought a car?
3. What do you think that John bought _ ?
4. What do you wonder whether John bought _ ?



Dependency length and other **grammatically irrelevant properties** give rise to gradience, likely due to processing, task, typicality, etc. effects

Sprouse 2007, Sprouse et al. 2012

Grammatical effects

Grammatical effects can be isolated by controlling for these processing effects in a 2 x 2 factorial design and measuring their superadditive interaction

Sprouse et al. 2012

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Question

Are these **grammatical effects** on acceptability **gradient** or **categorical**?

Possibilities

gradient, with magnitude proportional to interaction size, or **categorical**, with interaction size indicating one "unit" of acceptability, or a **hybrid** of the two

Ross 1967, Chomsky 1973, 1986, Keller 2000, Featherston 2005a,b, Sorace & Keller 2005, Sprouse 2007, Sprouse et al. 2012

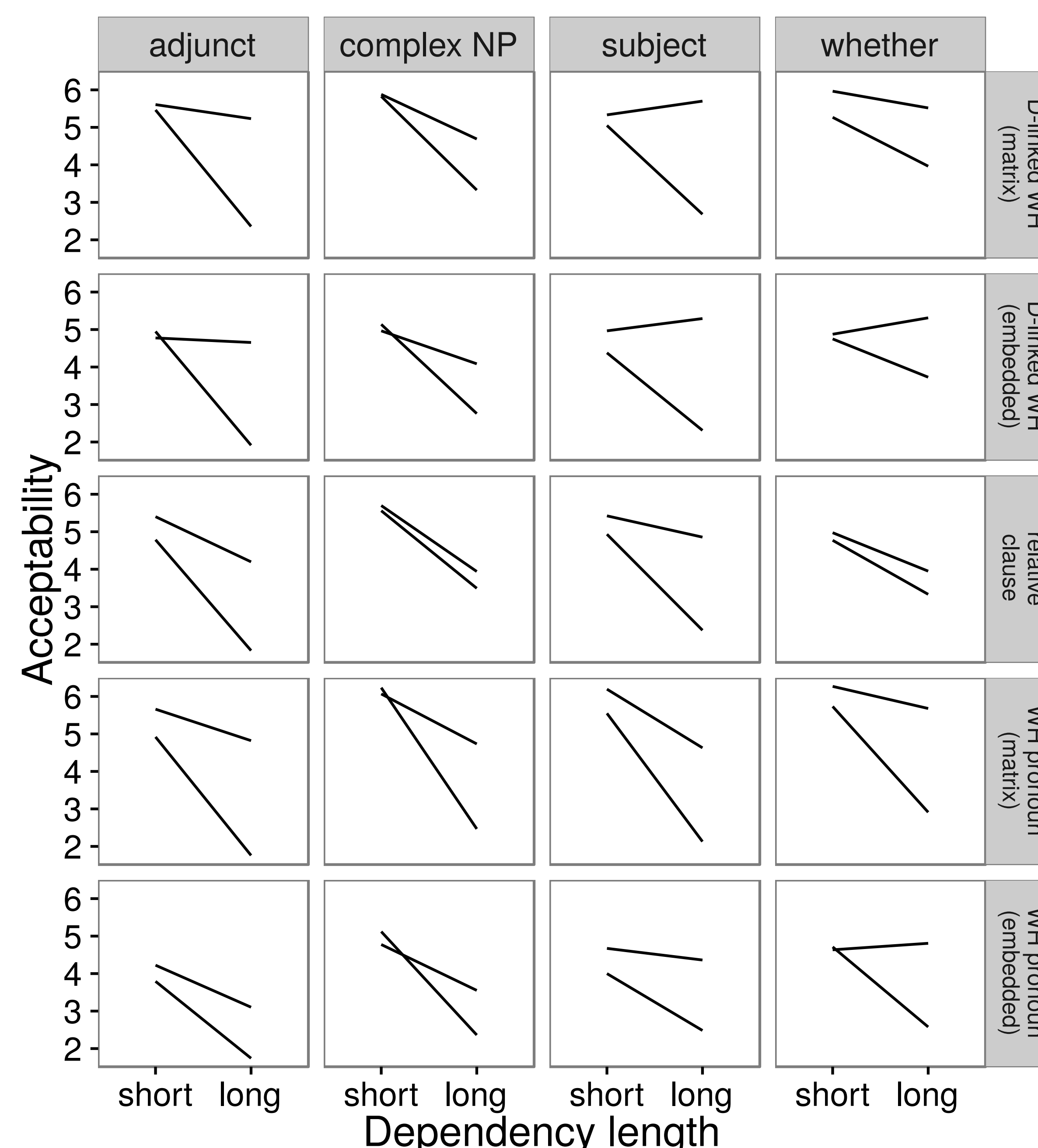
Obstacle

Impossible to tell from one experiment; need observations of different interactions

Data

20 experiments with 2 x 2 factorial design
columns = island structure
rows = dependency type

Sprouse & Messick 2015



Baseline model

Represent effects of **dependency length** and other **grammatically irrelevant properties** for each pairing of island structure and dependency type

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Operationalization

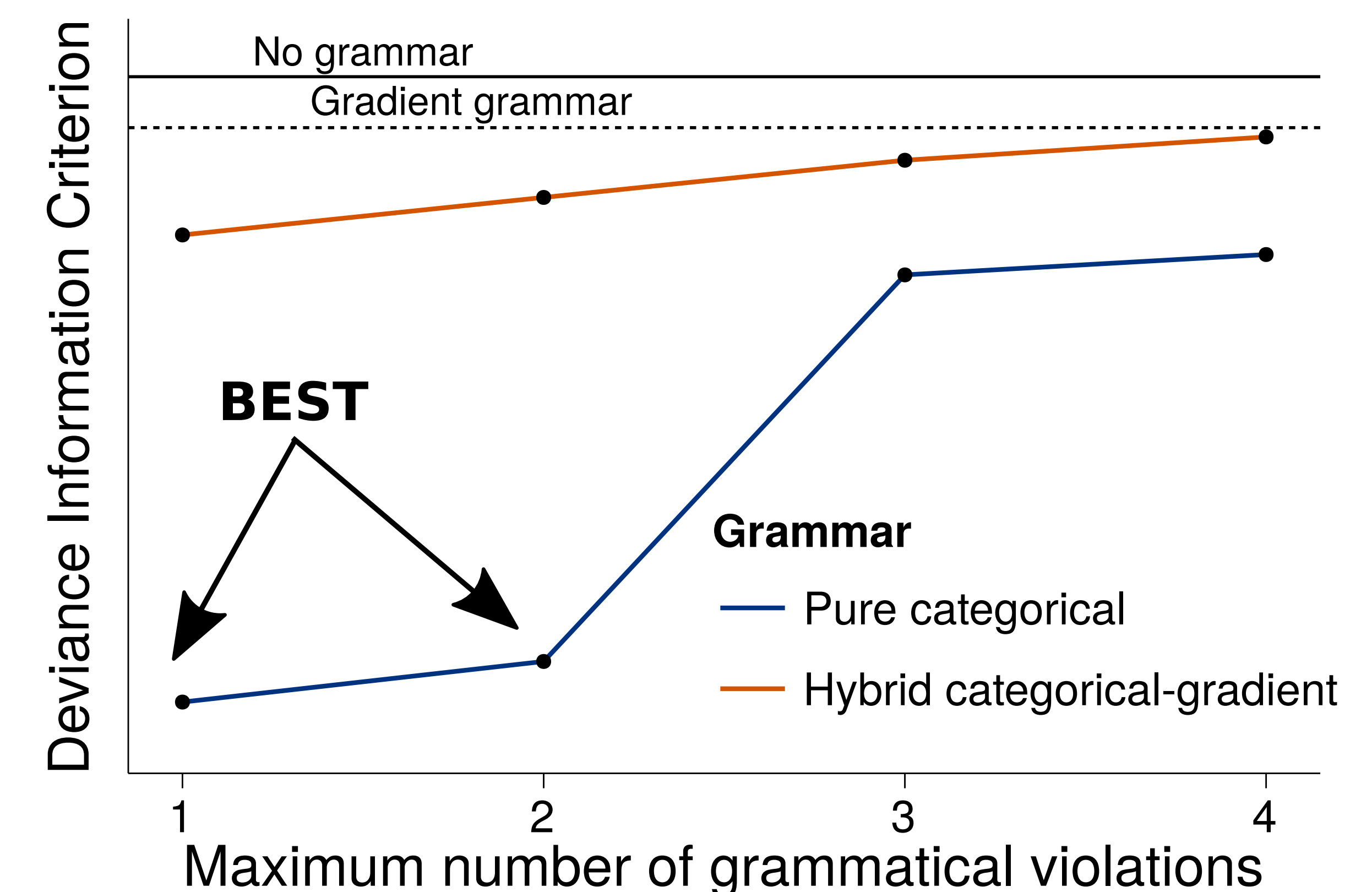
Are **grammatical effects** best represented as real-valued (0.54, 3.46, etc.) or natural-valued (0, 1, 2, 3, etc.)?

Models

No grammar: baseline model
Gradient: baseline + real-valued **effects**
Categorical: baseline + nat-valued **effects**
Hybrid: baseline + both kinds of **effects**

Statistical model comparison

Deviance Information Criterion (DIC)
model complexity - data fit (lower = better)
Data fit
No < **Categorical** < **Hybrid** < **Gradient**
Complexity
No < **Categorical** < **Hybrid** < **Gradient**



Conclusion and future directions

Categorical grammars are superior to **gradient grammars** for island effects
We plan to deploy the categorical model to study violation stacking phenomena

Chomsky 1986

Selected references

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Poster available at <http://aswhite.net> (or use QR code)