The Interplay of Morpho-Phonological and Semantic Influences of Modifiers on the Processing of Conceptual Subject-Verb-Number Agreement with Collective Noun Constructions In German

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Collective Noun Constructions and Agreement

For collective nouns, there is a mismatch between grammatical singularity and conceptual plurality, licensing both singular- and plural verbforms for agreement (Corbett 2000)

1. *[Eine Vielzahl der jungen Kinder] (sg., pl.) kauft (sg.)/?kaufen (pl.) einen Kuchen.*

   '[The multitude of the young children] (sg., pl.) buys (sg.)/?buy (pl.) a cake.'

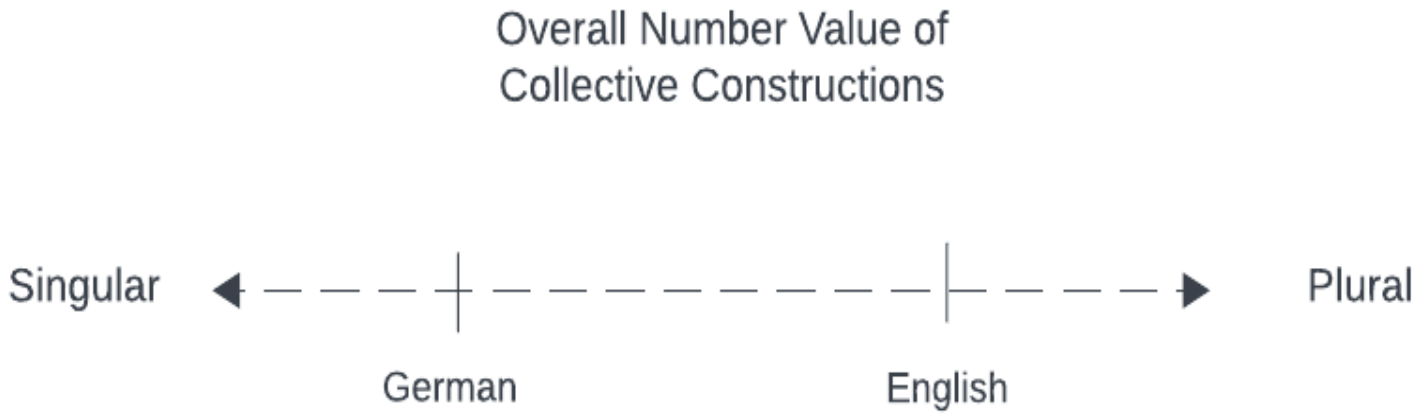
In a collective construction, the collective noun itself denotes plurality while the modifier-type denotes the type of entity.

The acceptability of conceptual agreement with collective construction is influenced by the interplay of semantic, morpho-phonological and syntactic factors

Marking and Morphing and Conceptual Agreement

The marking and morphing account (Bock et al. 2001) assumes that DP's have an overall continuous number value with singular and plural at its extremes. The overall number value is determined by the interplay of all relevant morpho-phonological, semantic and syntactic factors of the phrase

The higher the overall number value of the collective constructions shifts towards plural, the more acceptable conceptual agreement becomes



Conceptual Agreement and Modifier-Type

This talk investigates the influence of the modifier-type of collective constructions (the complement) on the overall number value.

1. Eine [**Vielzahl [der grünen Bäume]]**…

   ‘A multitude of the green trees…’

When considering the modifier-type, both semantic and morpho-phonological influences have to be taken into account as they cannot be separated

Modifier-Types for Collective Constructions in German

German Collective Noun Modification is determined by:

1. Phrase structure type (±PP):

Genitive attributes vs. PP attributes

2. Definiteness (±DEF)

(1) [+DEF, +PP]: Eine Vielzahl **von den grünen Bäumen**…

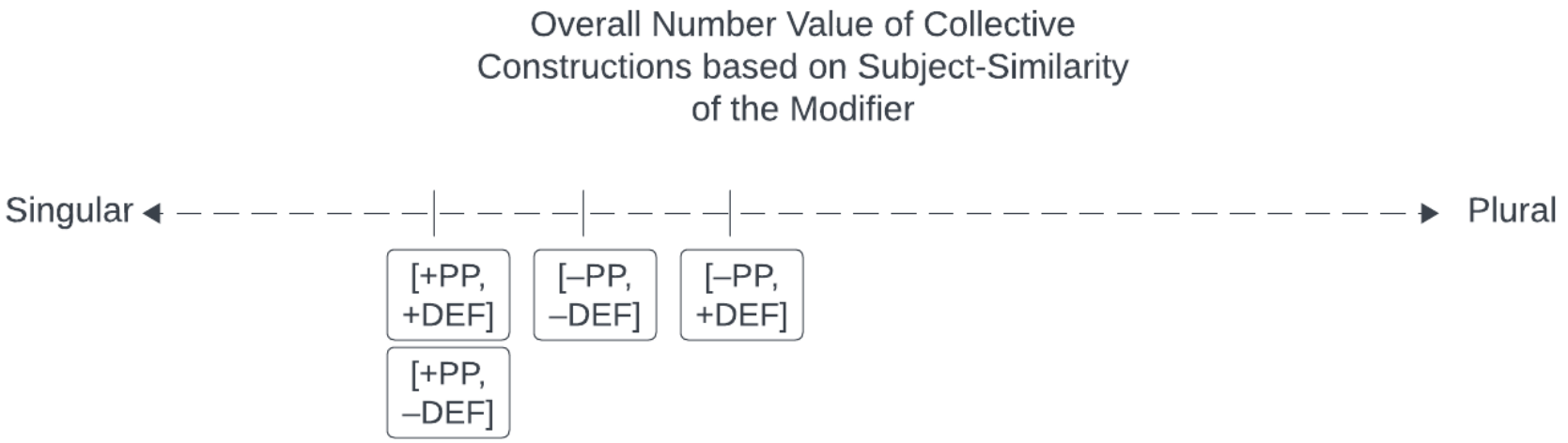
(2) [–DEF, +PP]: Eine Vielzahl **von grünen Bäumen**…

(3) [+DEF, –PP]: Eine Vielzahl **der grünen Bäume**…

(4) [–DEF, –PP]: Eine Vielzahl **grüner Bäume**…

'A multitude of (the) green trees'

Modifier-Type and Morpho-Phonological Influences



Goldberg's principle of no synonymy (1995: 67): "if two constructions are syntactically distinct, they must be semantically or pragmatically distinct"

Question: What are potential meaning differences between the modifier-types?

Modifier-Type and Morpho-Phonological Influences

In the marking and morphing paradigm (Bock et al. 2001), it is assumed that syncretisms to a nominative plural form increase the overall plurality of a phrase

- Processing a syncretic form leads to exhaustive functional activation (even unintended functions, particularly nominative plural get activated to a certaing degree)
- Collective constructions headed by the syncretic definite article *die* (e.g. *Die Mehrheit)* show significantly more conceptual agreement than when starting with *der* or *das* (e.g. Der Großteil) (Hartsuiker et al. 2001)

Essentially, the more closely the modifier resembles a subject-DP, the more acceptable conceptual agreement becomes.

- Number of syncretic forms + Phrase structure/Depth of embedding

(1)	[–PP, +DEF]… der **grünen Bäume**.	Syncretisms: Adjective + Noun; Phrase Structure: DP
(2)	[–PP, –DEF]… grüner **Bäume**.	Syncretisms: Noun; Phrase Structure: DP
(3)	[+PP, +DEF]… von den **grünen** Bäumen.	Syncretisms: Adjective; Phrase Structure: PP
(4)	[+PP, –DEF]…von **grünen** Bäumen.	Syncretisms: Adjective; Phrase Structure: PP
	'…of (the) green trees.'	

Modifier-Type and Partitivity

One potential meaning difference between the different types of modifiers that could be relevant for conceptual plurality is their degree of partitivity, i.e. the salience (or the probability) of a superset implicature triggered by the modifier

- How likely is it that processing the modifier evokes a complement set for which the main predication of the sentence does not hold

(1) Eine Vielzahl pinker Wulus fliegen über dem Dorf.

'A multitude of the pink wulus are flying above the village.'

+PP and +DEF are associated with higher degrees of partitivity (Löbel 1990, Lindauer 1995)

Prestudy: Modifier-Type and Partitivity

Participants were orally presented with sentences containing collective constructions manipulated by modifier type (2x2 within-subject design).

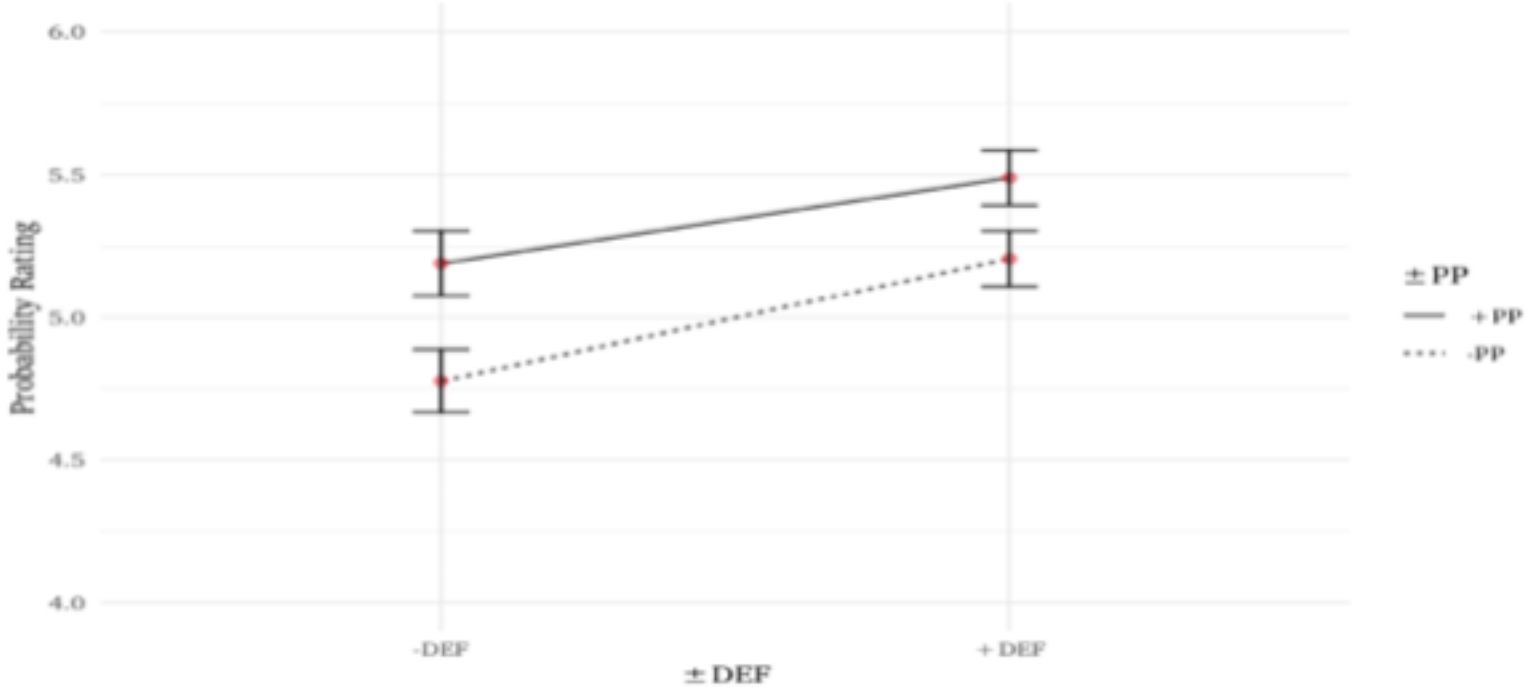
> *Sentence: 'A multitude of the pink wulus are flying above the village.'*
>
> *Question: 'How likely do you think it is that there exists at least one more pink wulu apart from those flying above the village'*

Participants were instructed to imagine being in a fantasy word where world knowledge does not apply and to determine the probability of the existence of other entities as those denoted by the collective construction but not referred to by it on a scale from 1 to 7.

48 participants participated

Each participant provided 4 observations per condition

Prestudy: Results



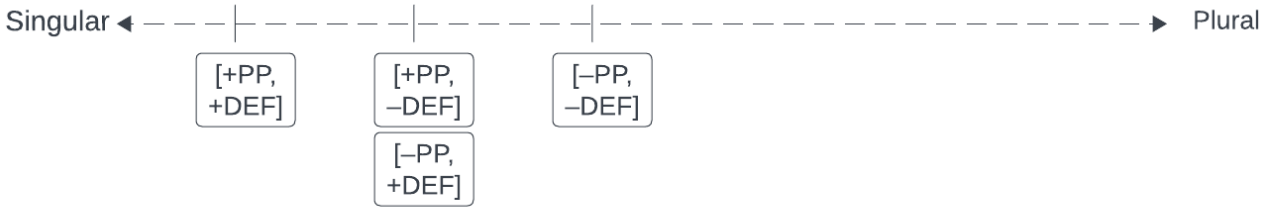
The data was analyzed using a linear mixed-effects model with random intercepts for participants, predicting the probability rating as a function of the factors ±PP, ±DEF and their interaction

The model indicates significant main effects (<.05) for ±PP and ±DEF, with positive values increasing partitivity.

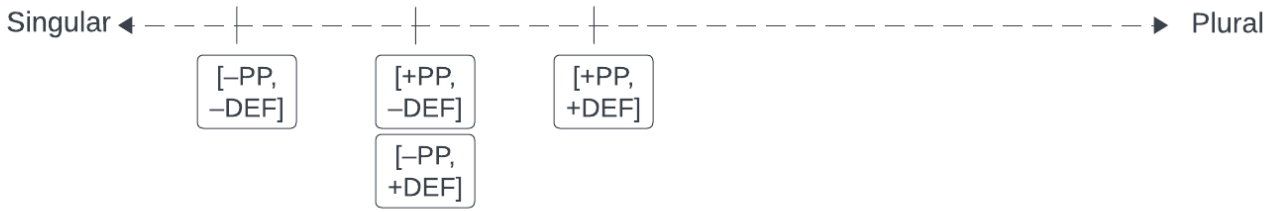
Prestudy: Discussion

While it can be shown that different modifier-types differ in partitivity, it is not clear how partitivity influences conceptual plurality (and therefore the overall number value)

Option 1: Overall Number Value of Collective Constructions based on Partitivity of the Modifier



Option 2: Overall Number Value of Collective Constructions based on Partitivity of the Modifier



Experiment: Hypothesis

Hypothesis: Different modifier-types with collective-constructions influence acceptability based on the interplay between morpho-phonological- (subject-similarity) and semantic factors (partitivity)

The Hypothesis is vague because:

1. The relative influence of the two factors is not predictable
2. The direction of the influence of the degree of partitivity is not predictable

Experiment: Method

Method: Speeded- grammaticality judgement procedure with rapid serial visual word presentation.

Each word is sequentially displayed for 425ms before automatically disappearing.

Task: The participants were instructed to read the sentence and judge as quickly as possible whether the sentence is grammatical or ungrammatical

Experiment: Items

Items: Each sentence consists of a matrix-clause embedding a subordinate clause with a sentence-final plural verb establishing conceptual-agreement. The subordinate clause contains a collective construction manipulated by modifier-type (2x2 repeated measures design) as the subject.

Item: Der | Lehrer | weiß, | dass | eine | Vielzahl | der | jungen | Schüler | in | der | Pause | Bier | trinken.

'The teacher knows that a multitude of the young students drink beer during the break'

- 4 experimental items per condition per list
- 24 filler-items per list (14 grammatical, 10 ungrammatical)

Participants: 70 participants prescreen for German as a native language and a submission rejection rate of ≤1% were recruited on Prolific

The experiment was constructed and data collected using Magpie

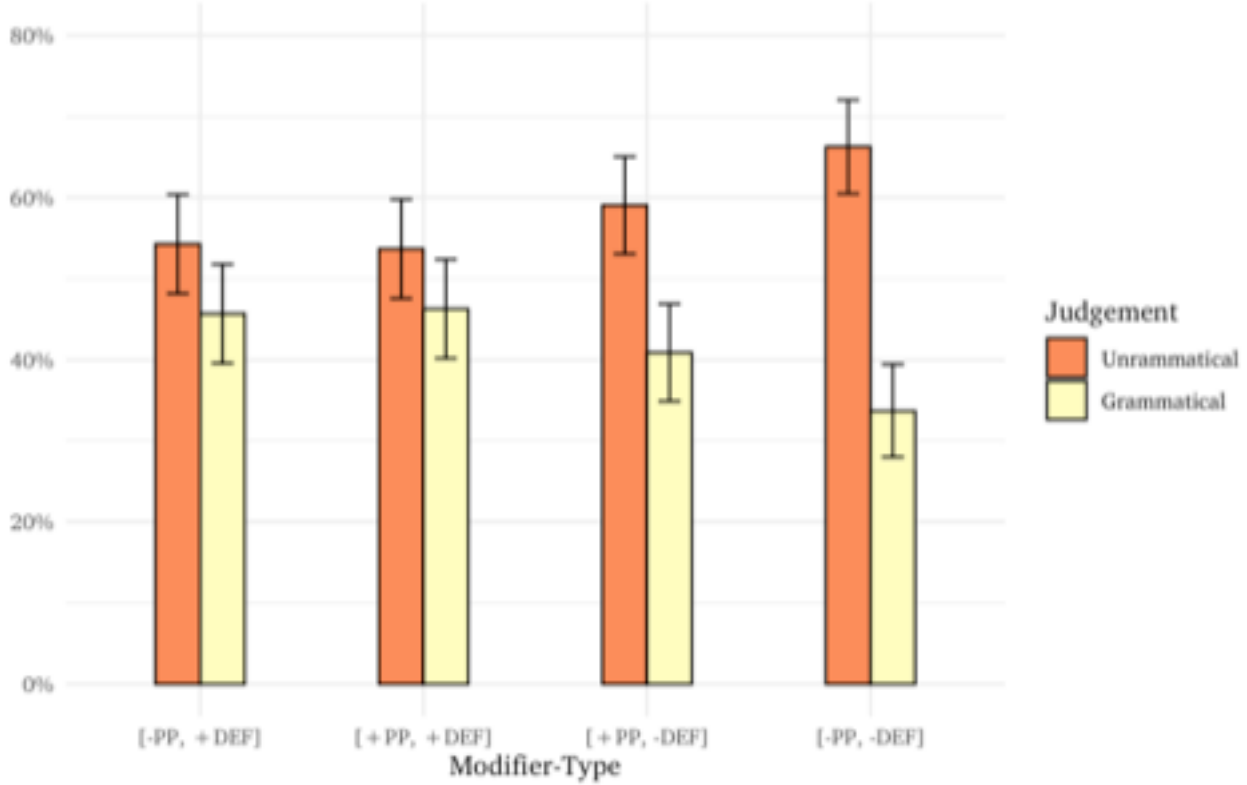
Experiment: Interpretation of Outcome Variables

Outcome Variables: Grammaticality Judgements and Reaction Times of *ungrammatical*-judgements

The stronger the modifier-type biases the overall number value of the collective construction towards plurality, the:

1. Higher the proportion of *grammatical*-judgements is expected to be
2. Slower the reaction times for *ungrammatical*-judgements are expected to be due to increased competition between grammatical- and conceptual agreement

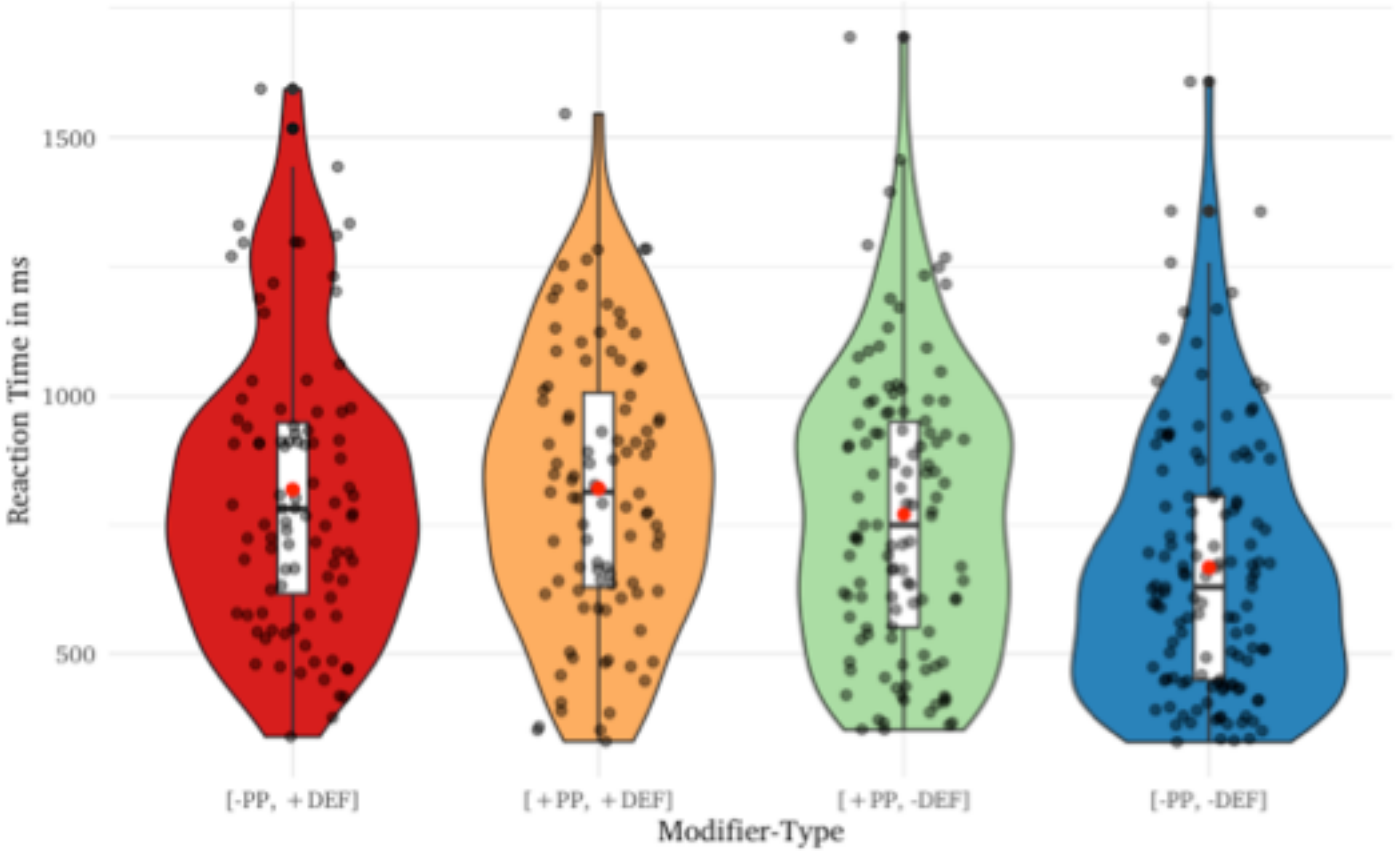
Experiment: Grammaticality Judgements Results



Analysed using a generalized linear mixed-effects model with random intercepts for participants, predicting the probability of grammatical-judgements as a function of the factors ±PP, ±DEF and their interaction.

A pairwise comparison of the conditions indicates that the conditions [–PP, +DEF] and [+PP, +DEF] differ significantly ($p \leq .05$) from condition [–PP, –DEF], with [–PP, –DEF] having fewer *grammatical*-judgements

Experiment: Reaction Times Results



Analysed using a linear mixed-effects model with random intercepts for participants, predicting the reaction time as a function of the factors ±PP, ±DEF and their interaction.

A pairwise comparison of the conditions indicates that the conditions [–PP, +DEF] and [+PP, +DEF] differ significantly ($p \leq .05$) from condition [–PP, –DEF], with [–PP, –DEF] showing a significantly lower reaction time

Discussion

In regard to the degree of partitivity, the data indicates that a higher degree of partitivity increases conceptual plurality

- Condition [–PP, –DEF] differing significantly from the other options in both outcome variables despite the subject-similarity relatively biasing towards plurality
- While there are no significant differences [+PP, –DEF] descriptively patterns differently from [+PP, +DEF]

The data indicates that neither morpho-phonological nor semantic factors of different modifier-types in collective constructions alone can account for the differences in acceptability of conceptual agreeement

- The same behavior between [+PP, +DEF] (maximal partitivity) and [–PP, +DEF] (maximal subject-similarity)

Thank you for your attention!

Conclusion

- While it is interesting to investigate phenomena where different levels of linguistic processing cannot be separated, this considerable complicates the predictability and interpretability of the results

- One the other hand, some factors like the degree of partitivity cannot be investigated in isolation as they are the result of different formal realizations