

Denominal and deverbal eventuality-related nominalizations from a discriminative perspective

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Eventuality-related nominalizations



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 - (1) *employee, trainee*
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 - (2) *Markham sets down the rules about park befoulment.* (Plag et al. 2018: 474)
 - whole eventuality reading
- Semantic representation provides eventualities and participants for word formation process (e.g., Plag et al. 2018, Kawaletz 2023, Schneider 2023)
- Research tends to focus on deverbal nominalizations (e.g., Barker 1998; Alexiadou 2010; Kawaletz & Plag 2015; Plag et al. 2018; Kawaletz 2023)



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- Aim of this paper: explore potential semantic differences between deverbal and denominal eventuality-related nominalizations



Research questions

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RQ1

Do denominal and deverbal derivatives show the same degree of semantic similarity to their bases?

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RQ2

Which factors influence the semantic similarity of derivatives and bases?



Method: linear discriminative learning

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- Computational methods proved to be useful for semantic analyses, e.g., linear discriminative learning – LDL (e.g., Chuang et al. 2021, Schmitz et al. 2021, Stein & Plag 2021, Schmitz et al. 2022, Schmitz et al. 2023)

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- In this usage-based approach, morphology resides in the semantic and phonological relationships between entries in the mental lexicon

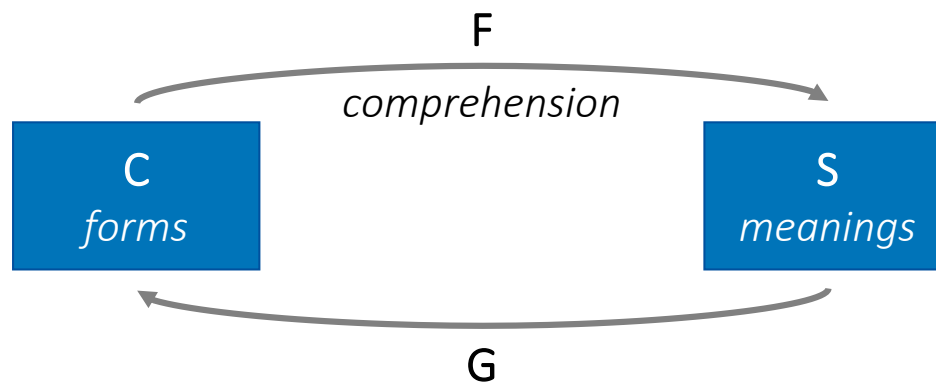
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- In this usage-based approach, morphology resides in the semantic and phonological relationships between entries in the mental lexicon
- LDL simulates an individual's mental lexicon incl. all entries and target words (e.g., Baayen et al., 2019)
- Measures extracted from the simulated lexicon express semantic and phonological relationships of the entries

Method: linear discriminative learning



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- Form matrix C contains information on word forms
 - Here: trigrams

	#dr	dre	res	ess	ss#	#pe	pea	eac	ach	ch#
<i>dress</i>	1	1	1	1	1	0	0	0	0	0
<i>peach</i>	0	0	0	0	0	1	1	1	1	1

Method: linear discriminative learning

- Semantic matrix S contains word vectors
 - From naive discriminative learning

(NDL, Baayen & Ramscar 2015; vectors from Baayen et al. 2019)

	skirt	t-shirt	apple	banana
dress	0.45	0.26	0.03	0.008
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← word vectors

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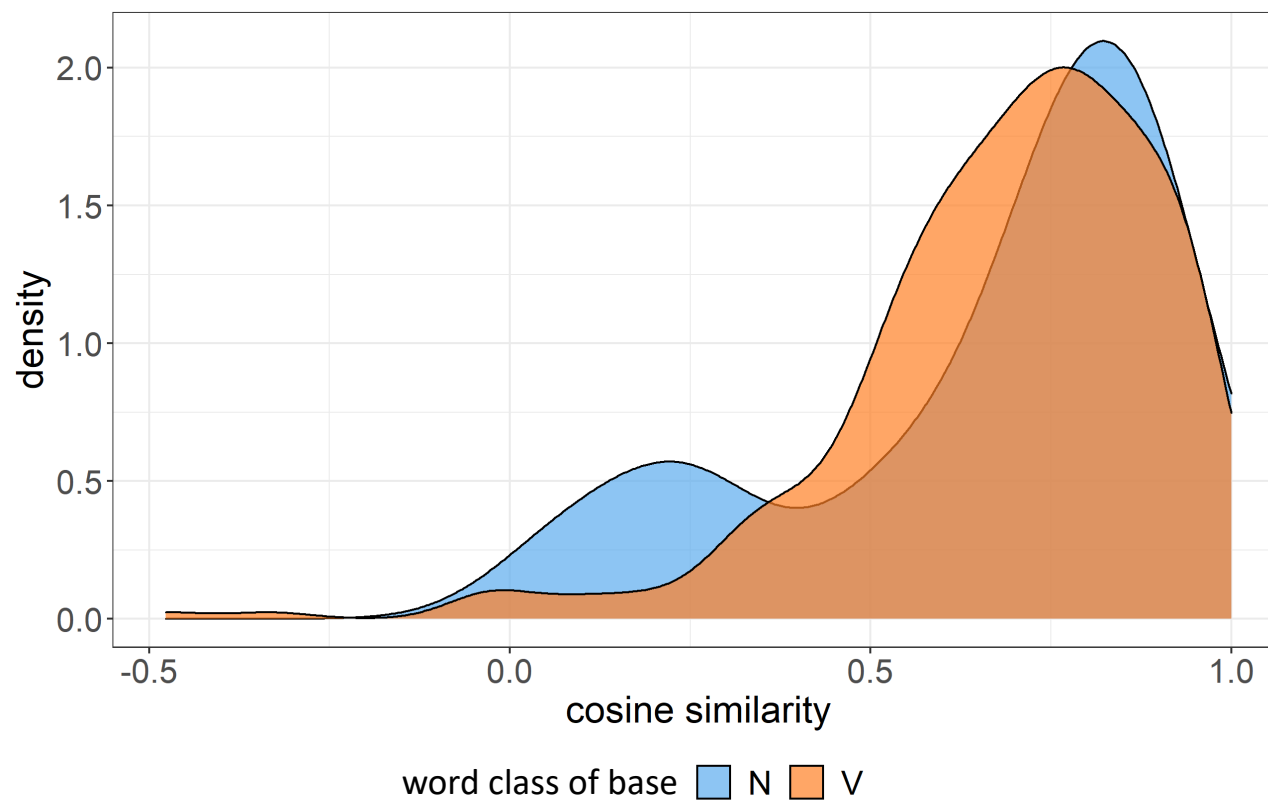
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- Higher cosine similarity values indicate a higher degree of similarity

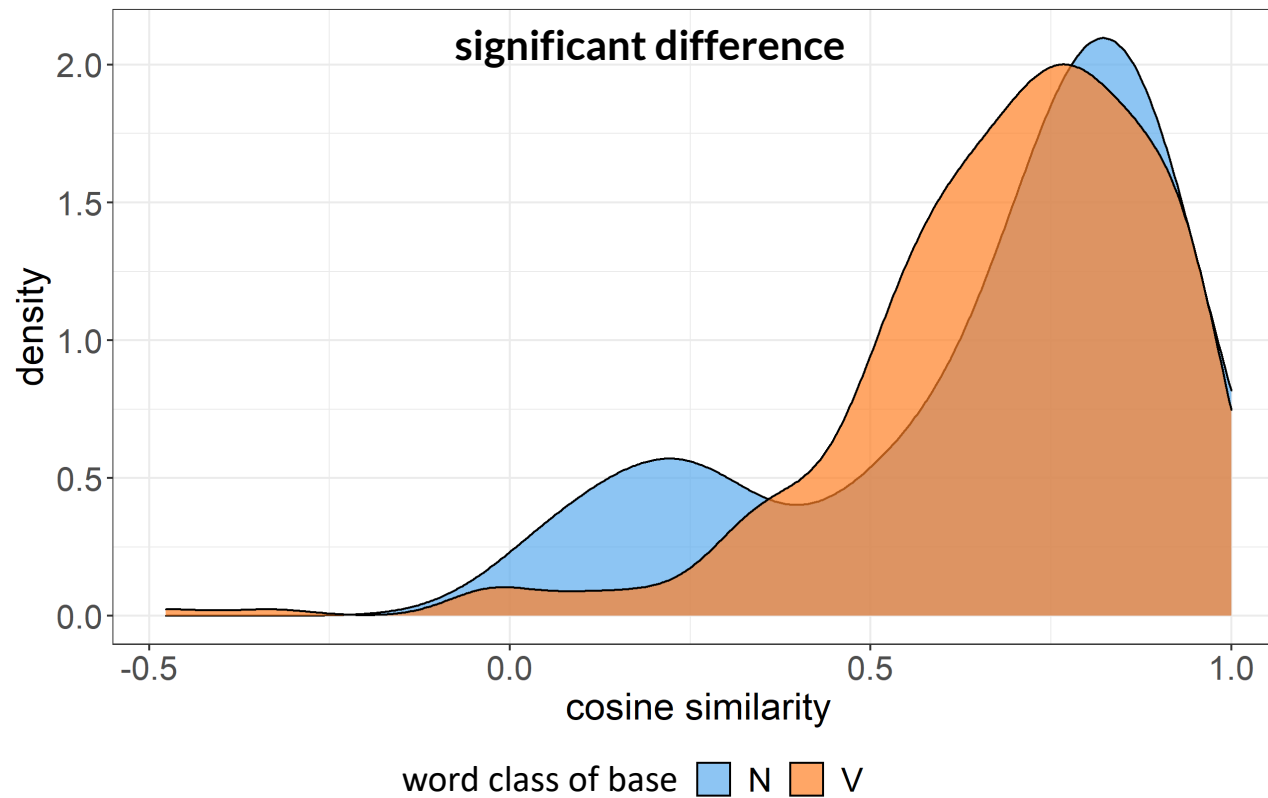


Cosine similarities: $-ee$

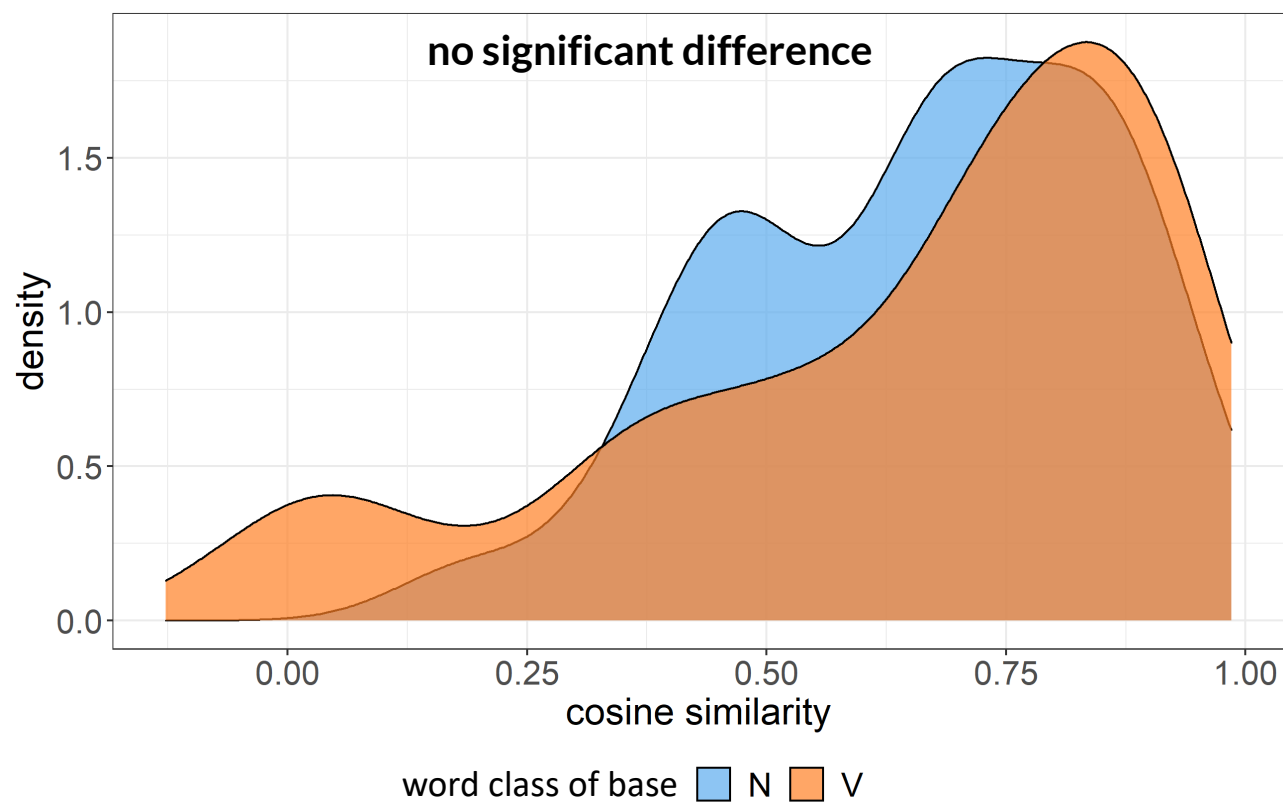
Cosine similarities: -ee



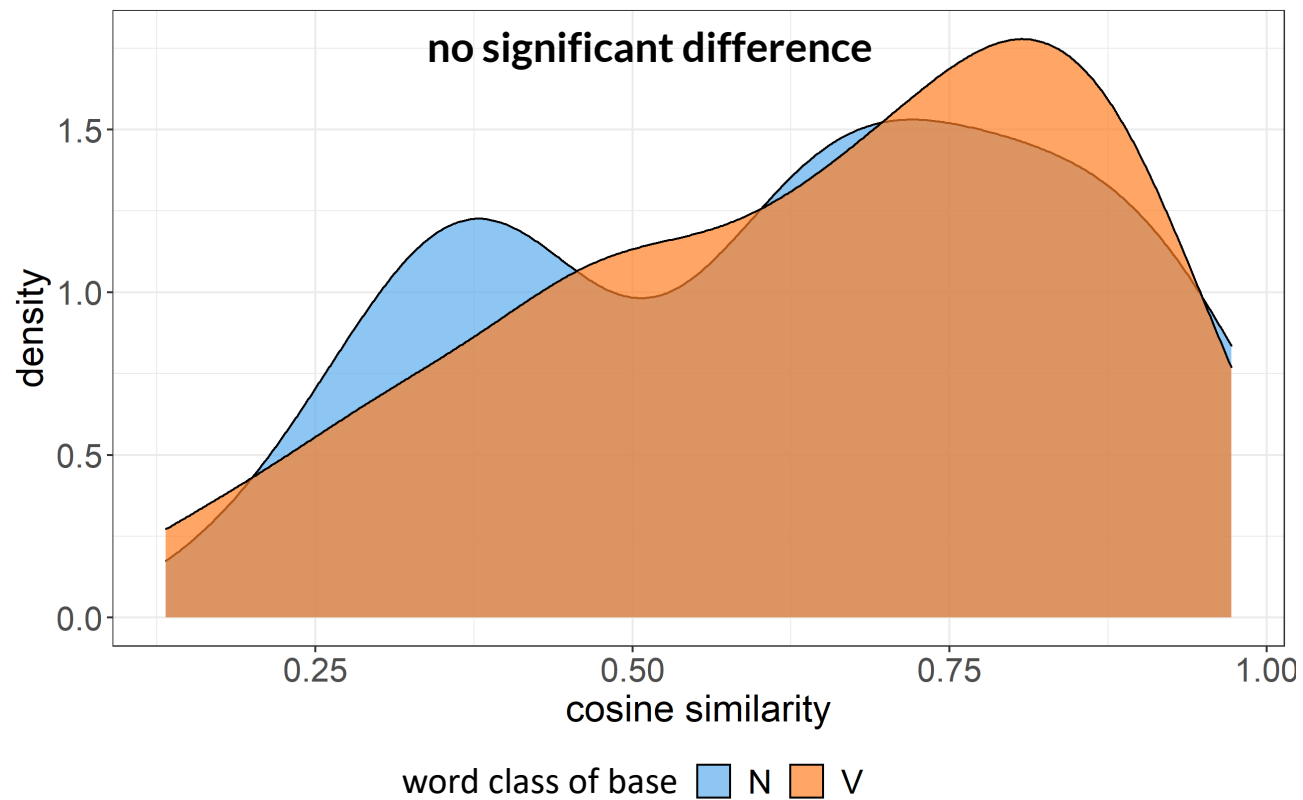
Cosine similarities: -ee



Cosine similarities: *-ment*



Cosine similarities: *-ation*



Analysis 2

Which factors influence the semantic similarity of derivatives and bases?



Measures



Measures

- **Traditional measures**
 - base polysemy
 - relative frequency
 - word class of base

Measures

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- base polysemy
- relative frequency
- word class of base

- **LDL measures**

- Semantic co-activation
higher = higher degree of co-activation in the lexicon
- Neighborhood density
denser = more other words have similar semantics



Beta regression



Beta regression

- Beta regression statistical tool as cosine similarity in range of (0,1)



Beta regression

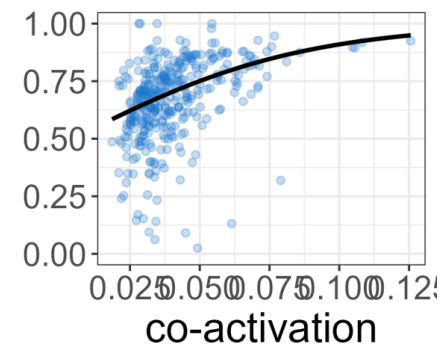
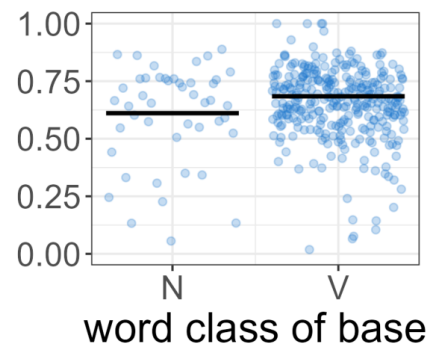
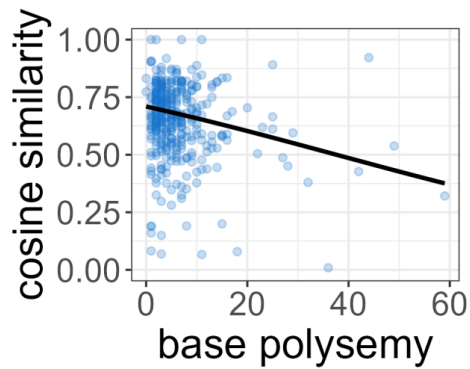
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- *cosine similarity* ~

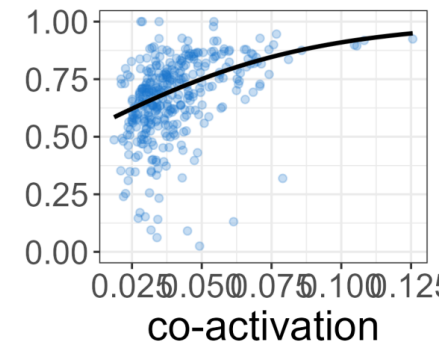
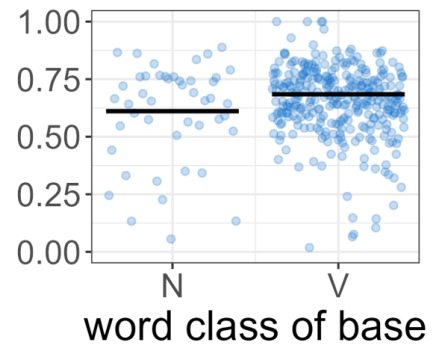
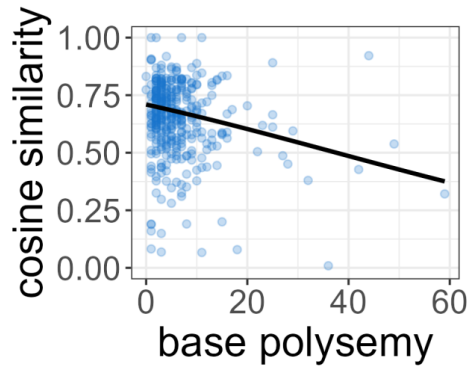
*semantic co-activation +
neighborhood density +
base polysemy +
relative frequency +
word class of base*

Beta regression results: -ee



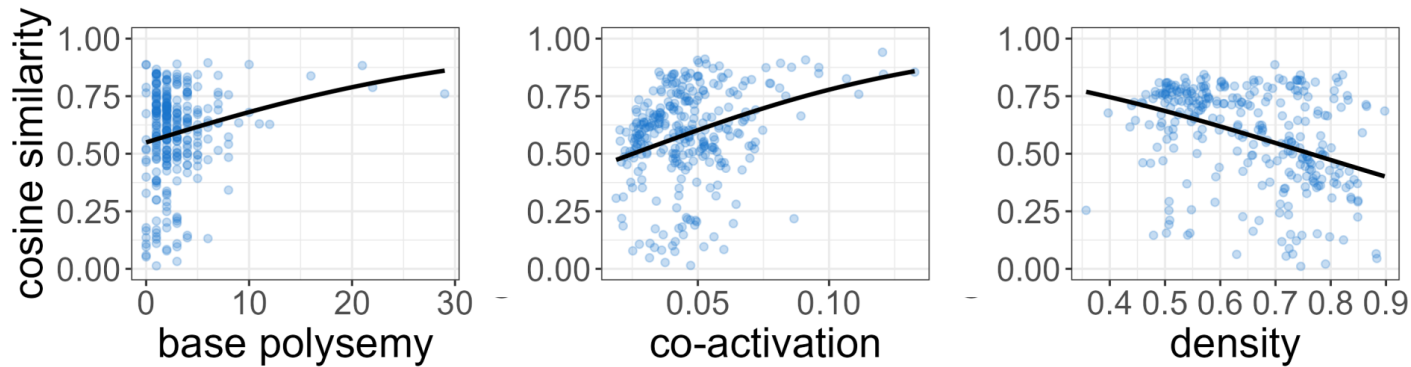
Beta regression results: -ee

- Significant effects
 - Base polysemy
 - Word class of base
 - Semantic co-activation



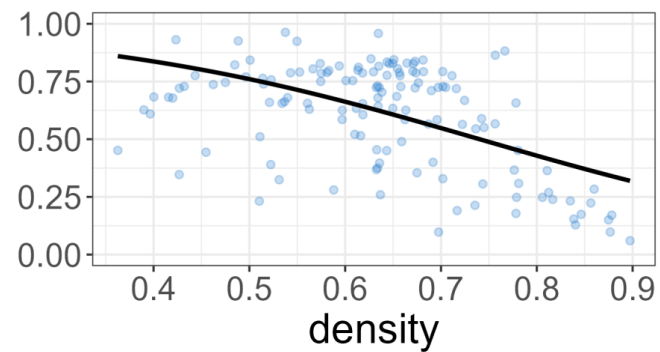
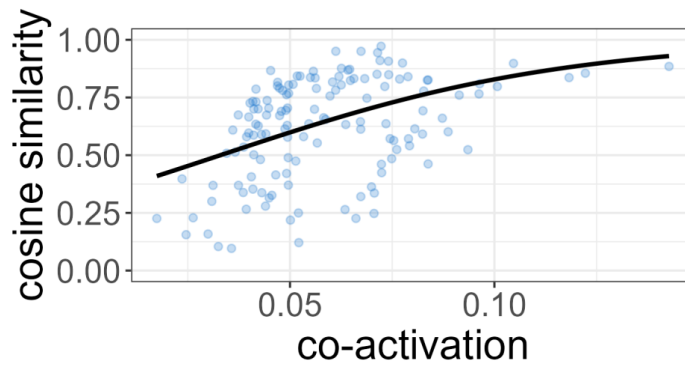
Beta regression results: *-ment*

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Beta regression results: *-ation*

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Discussion

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Do denominal and deverbal derivatives show the same degree of semantic similarity to their bases?

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Do denominal and deverbal derivatives show the same degree of semantic similarity to their bases?



no
for *-ee*



yes
for *-ment*



yes
for *-ation*



Discussion

RQ2

Which factors influence the semantic similarity of derivatives and bases?

Discussion

RQ2

Which factors influence the semantic similarity of derivatives and bases?



-ee

Word class of base
Base polysemy
Semantic co-activation



-ment

Base polysemy
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Neighborhood density



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Conclusion



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THANK YOU!

References

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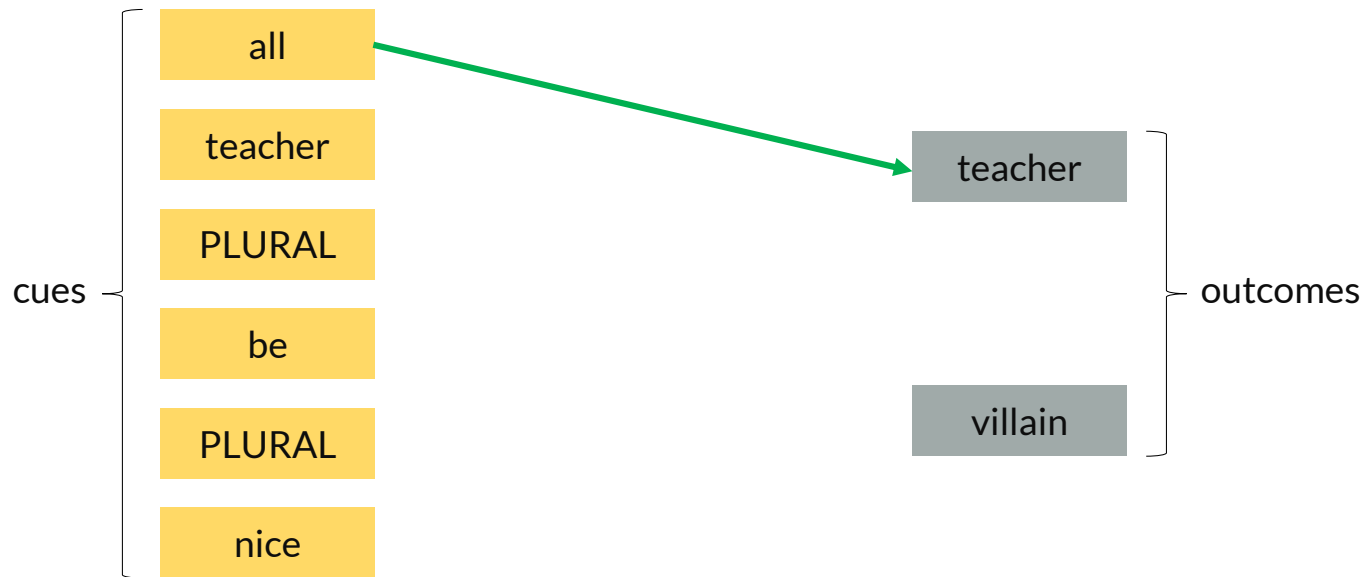
Method



Example: *All teachers are nice.*

	all	teacher	PLURAL	be	nice	villain	evil
teacher							
villain							

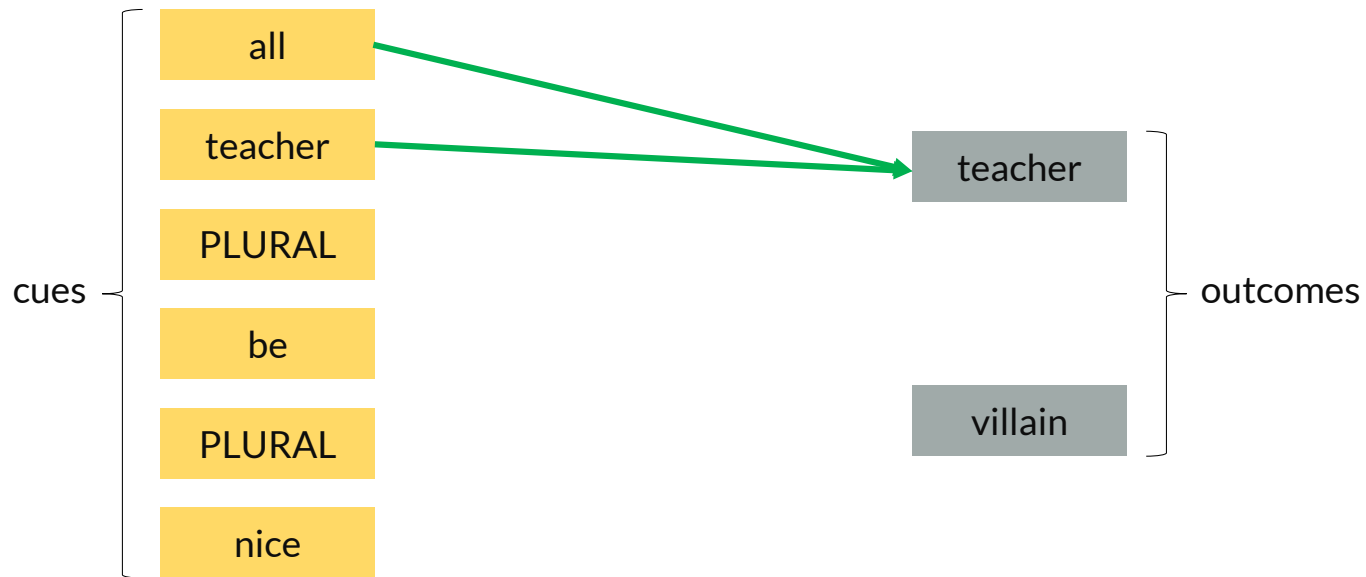
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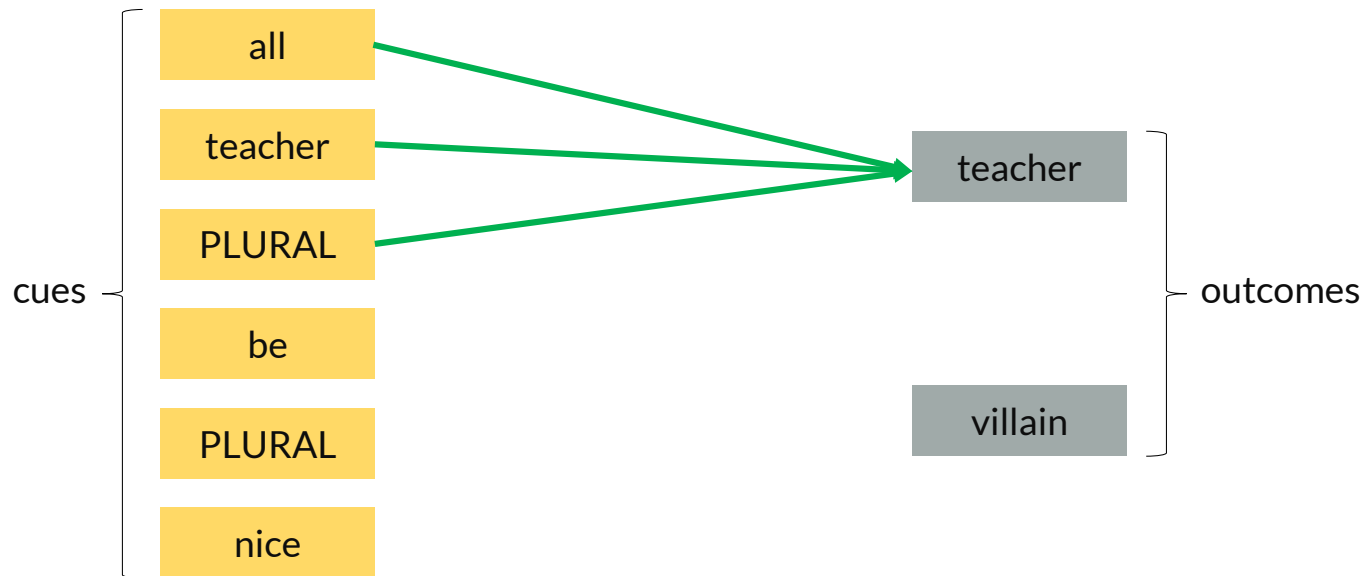
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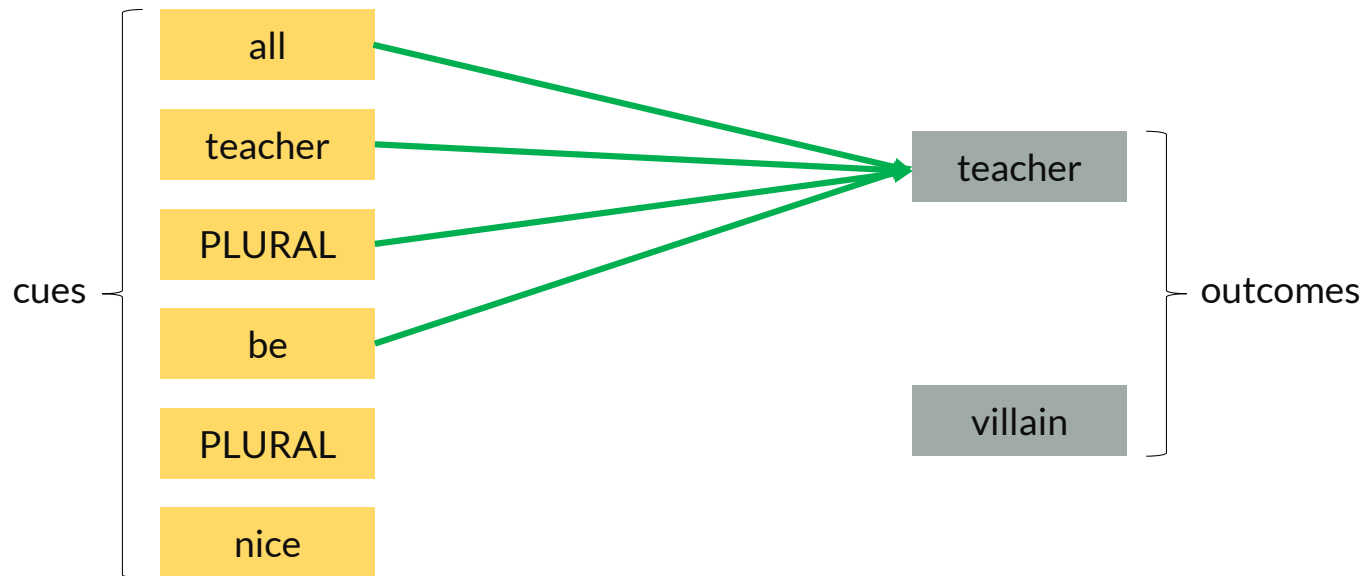
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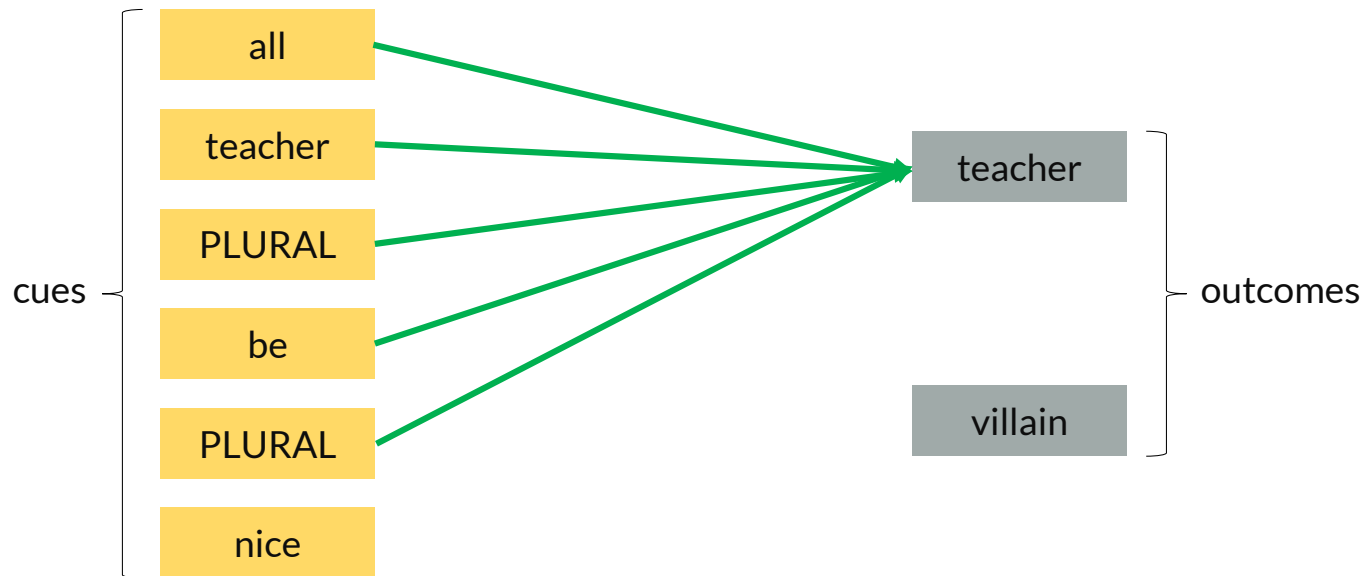
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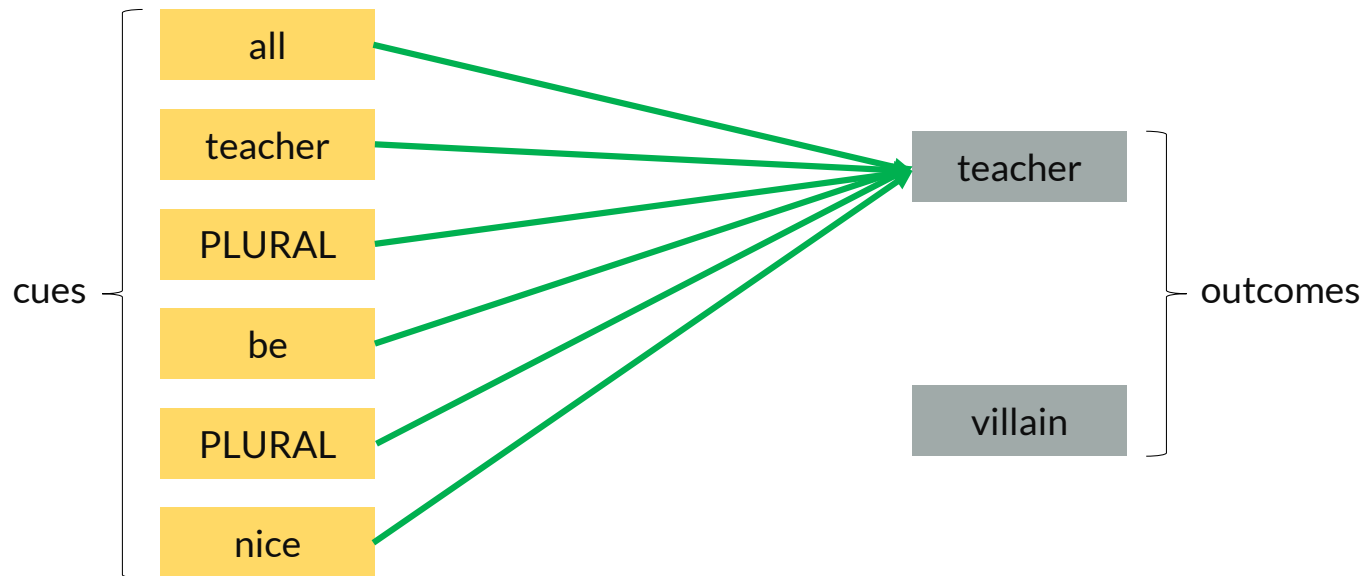
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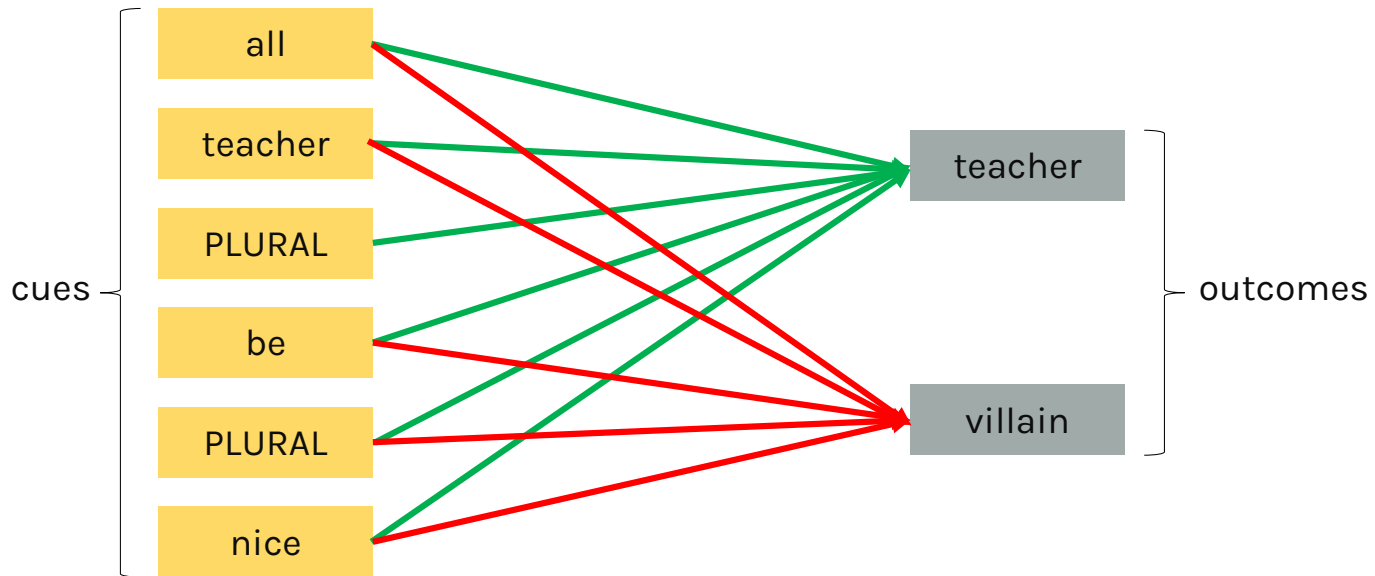
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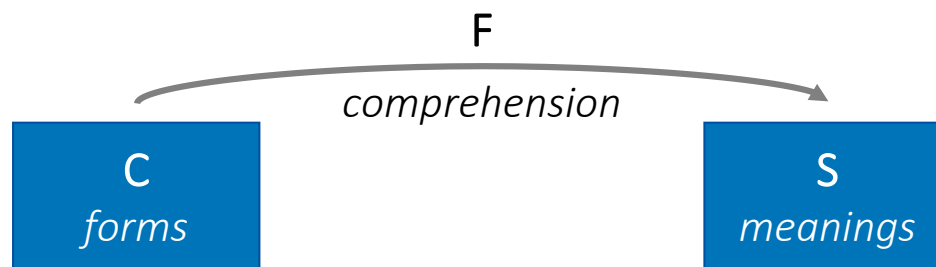
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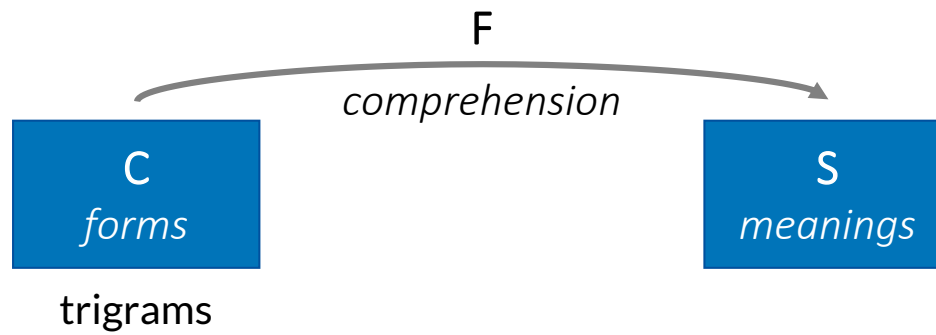
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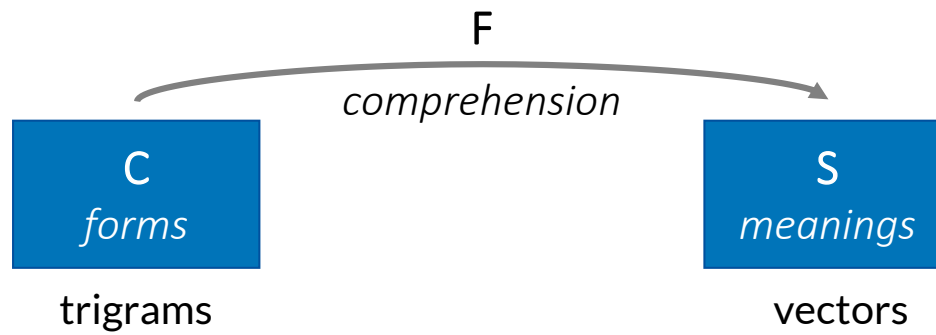
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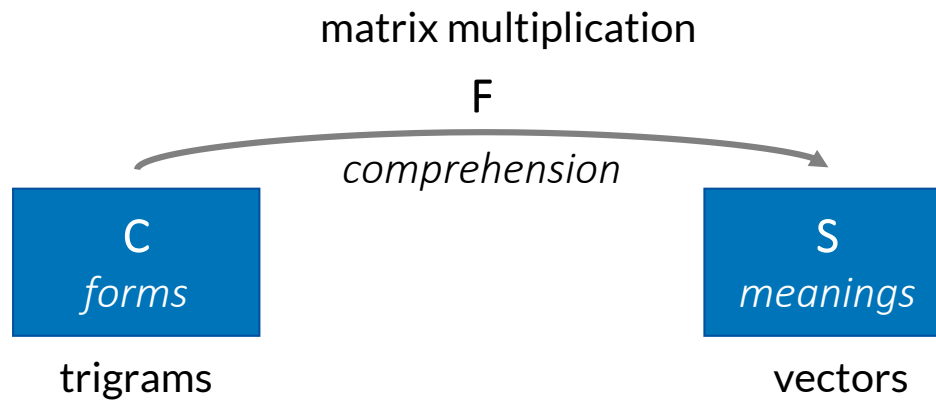
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