

Denominal and deverbal eventuality-related nominalizations from a discriminative perspective

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- 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

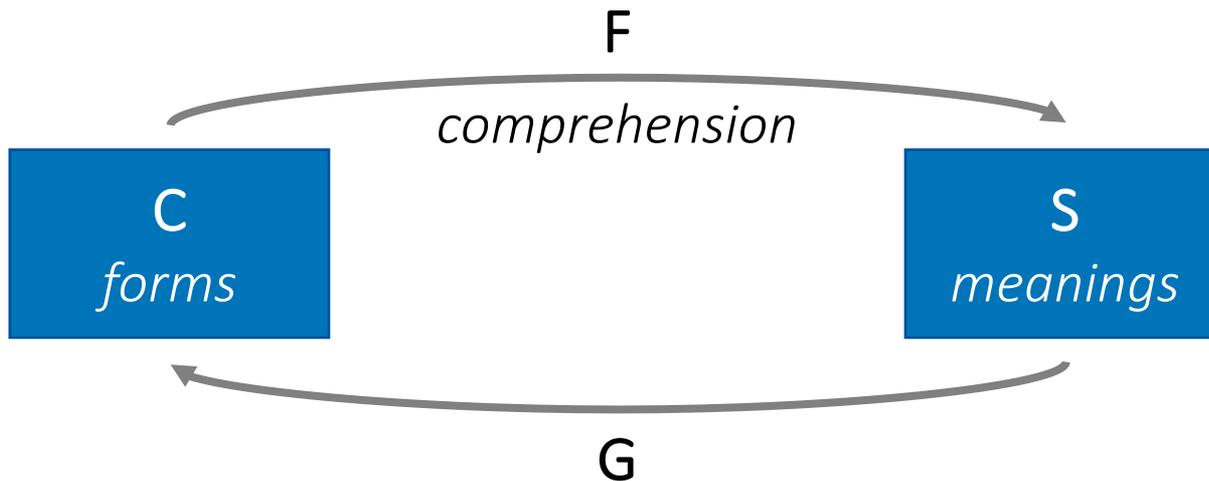
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- In this usage-based approach, morphology resides in the semantic and phonological relationships between entries in the mental lexicon
- LDL simulates an individual's mental lexicon incl. all entries and target words (e.g., Baayen et al., 2019)
- 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
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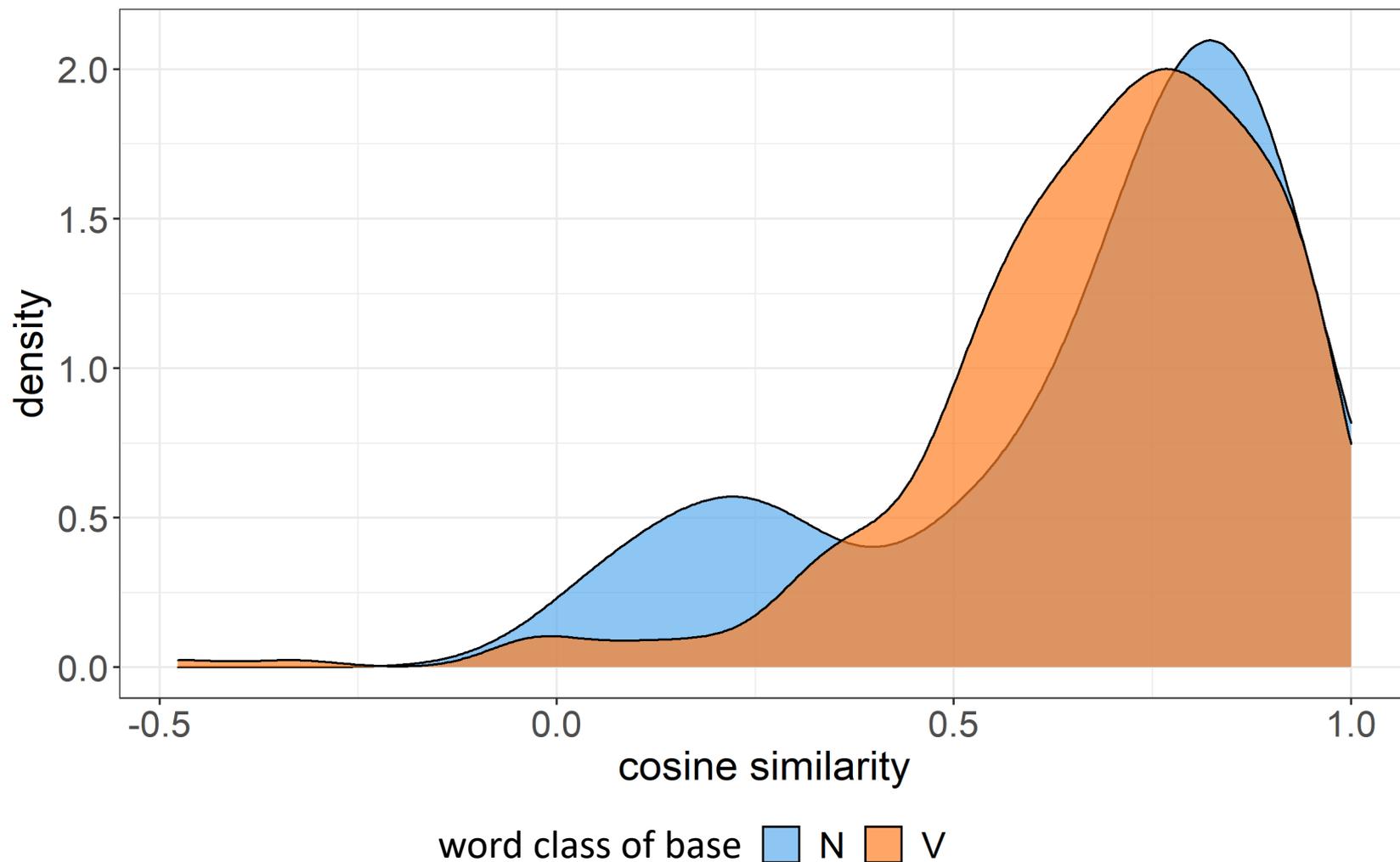
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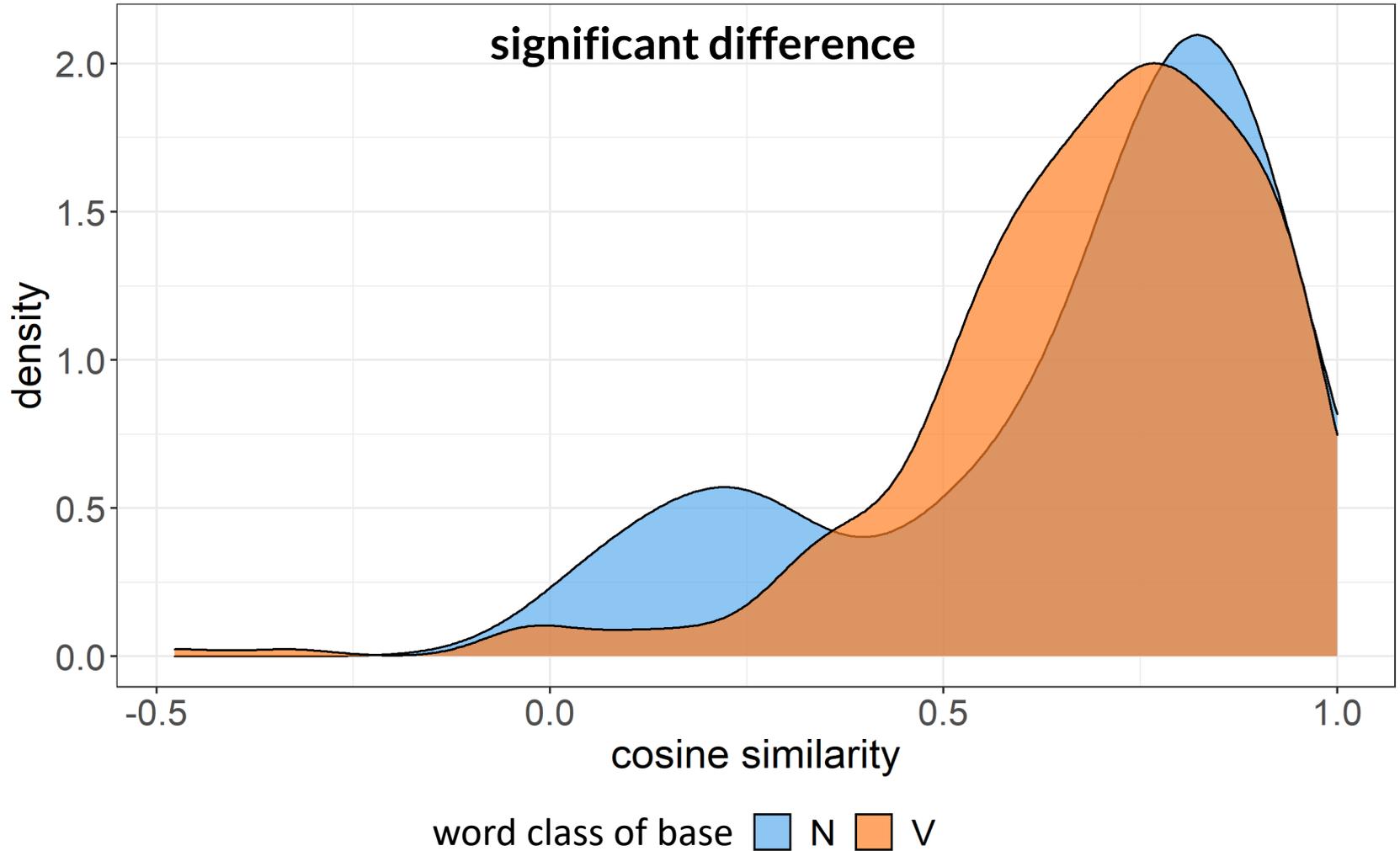
- The similarity of bases and derivatives is computed via their vectors
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- Higher cosine similarity values indicate a higher degree of similarity

Cosine similarities: $-ee$

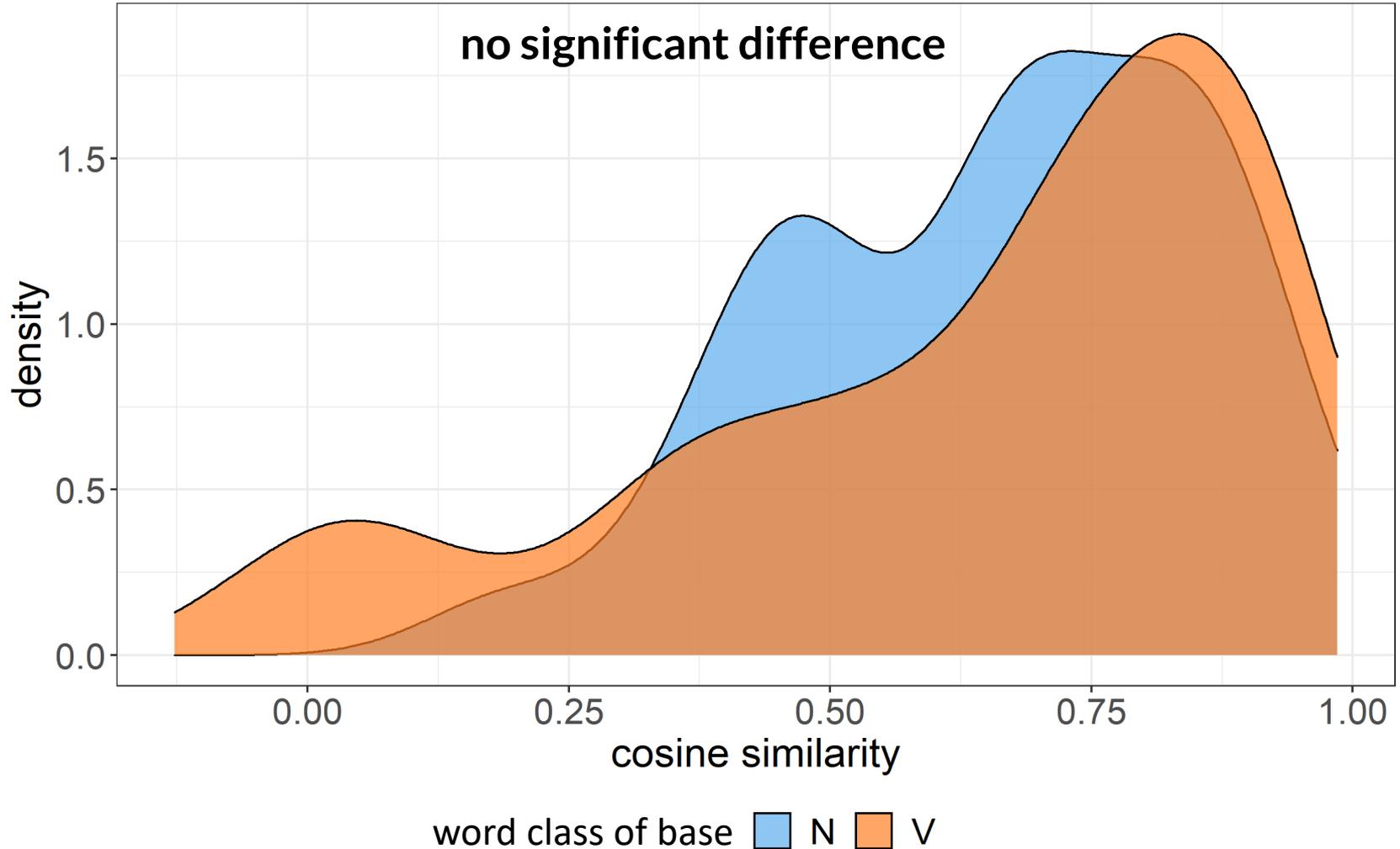
Cosine similarities: -ee



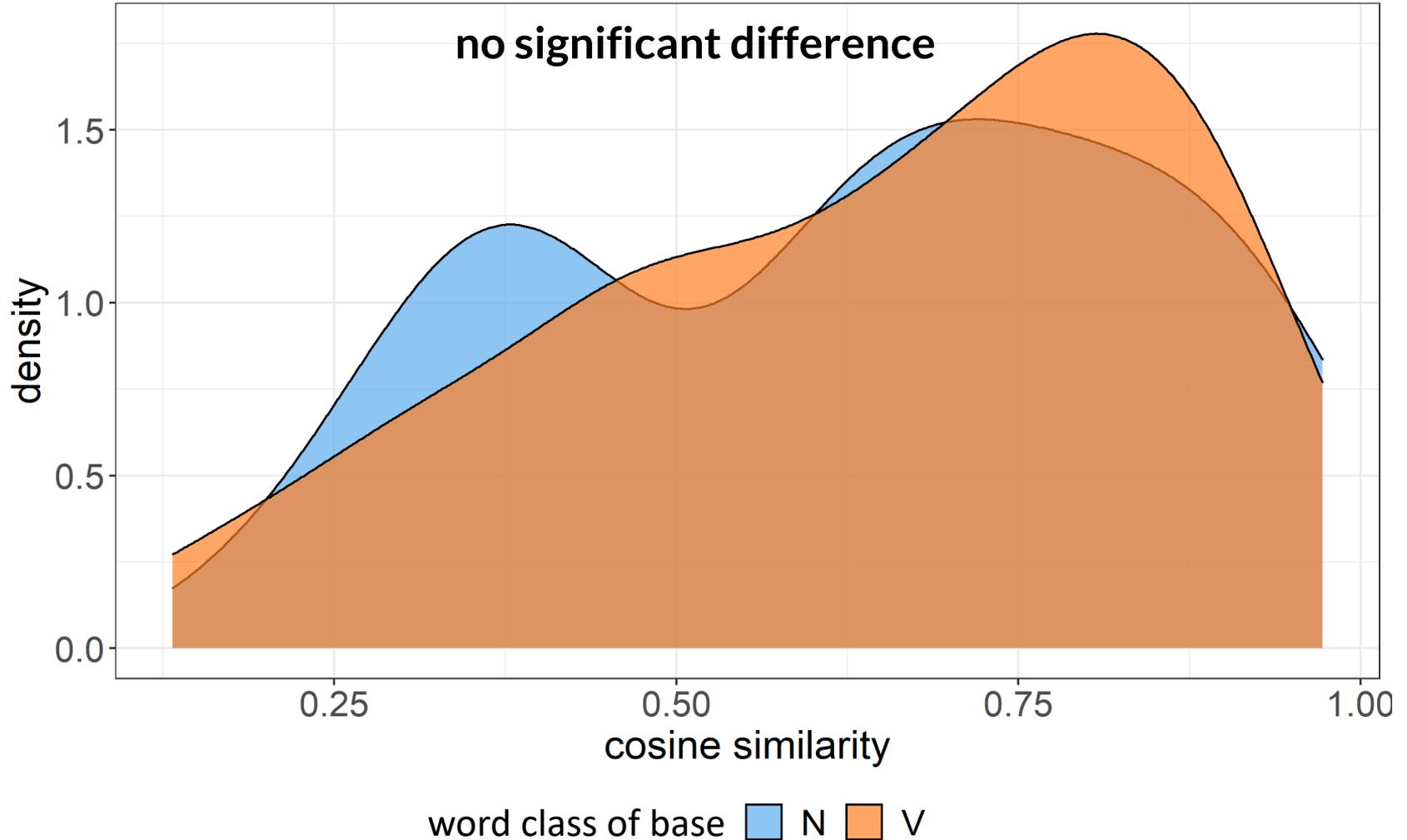
Cosine similarities: -ee



Cosine similarities: *-ment*



Cosine similarities: *-ation*



Analysis 2

Which factors influence the semantic similarity of derivatives and bases?

Measures

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

Measures

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- base polysemy
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- 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

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semantic co-activation +

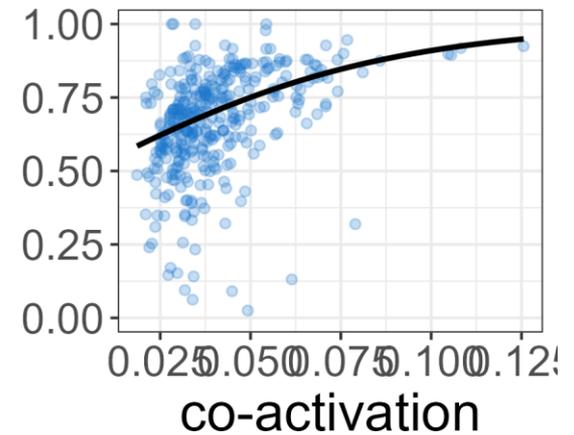
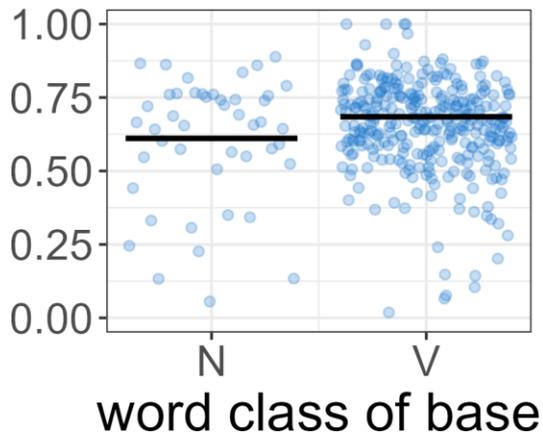
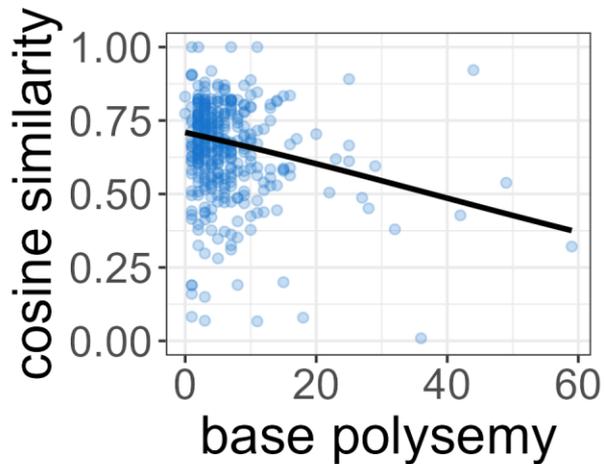
neighborhood density +

base polysemy +

relative frequency +

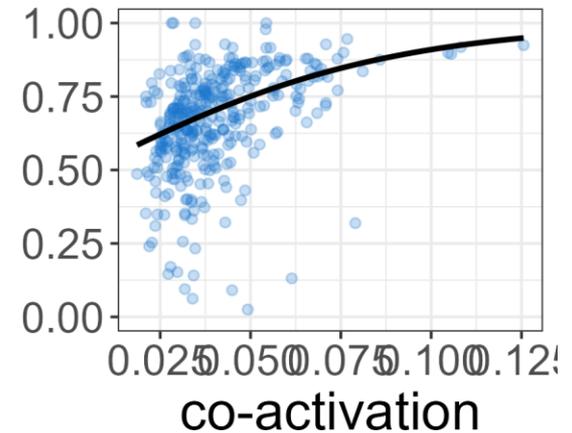
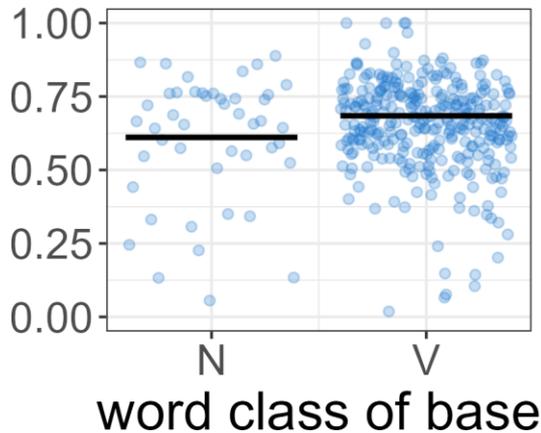
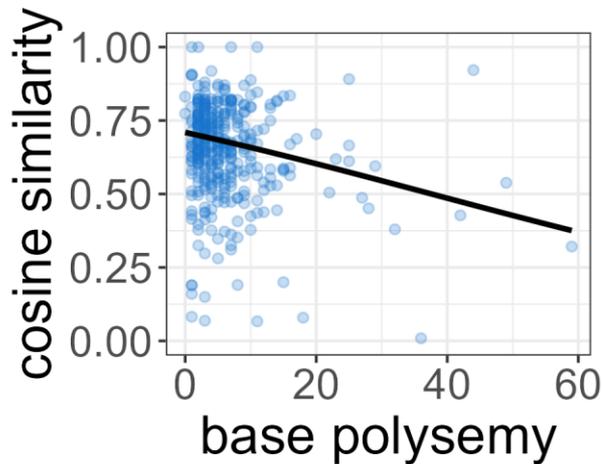
word class of base

Beta regression results: -ee



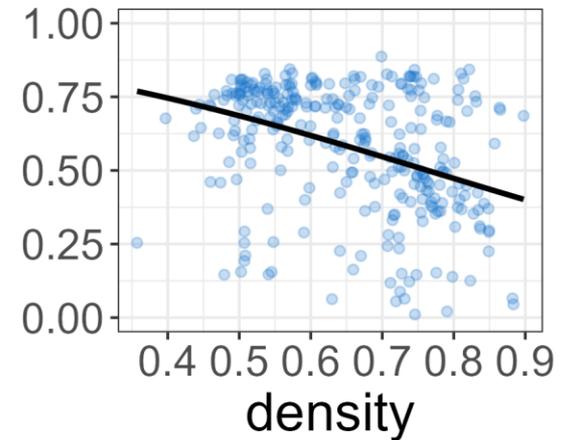
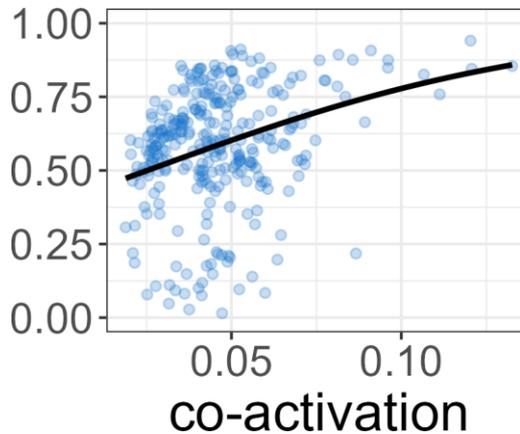
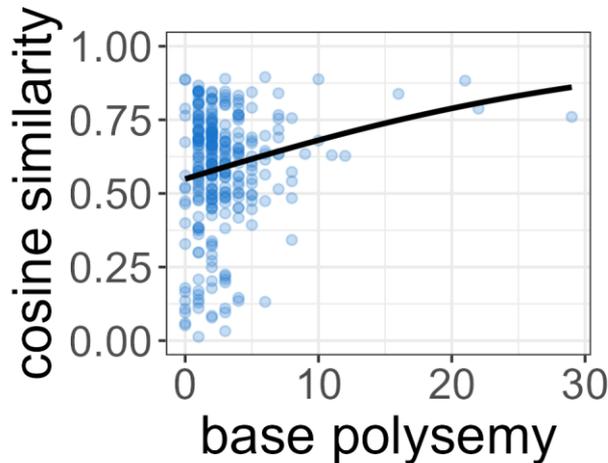
Beta regression results: -ee

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



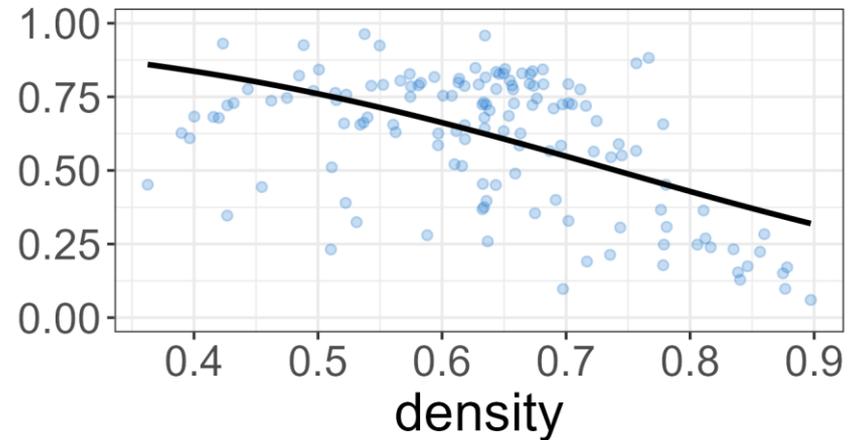
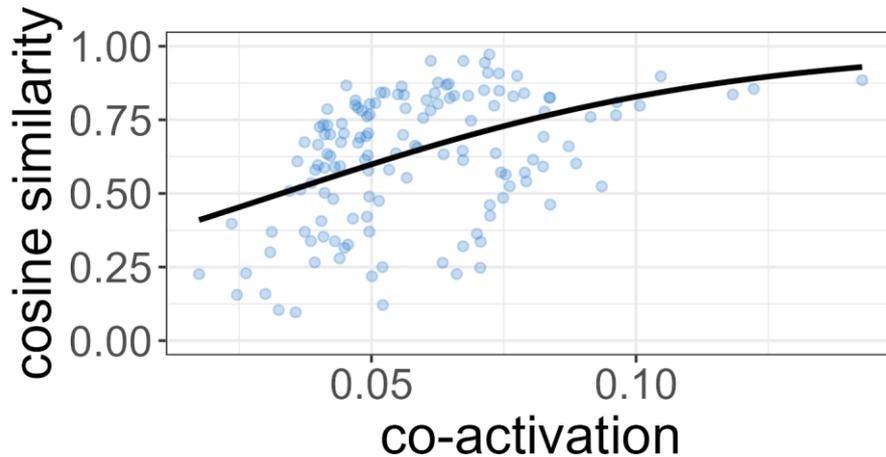
Beta regression results: *-ment*

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Discussion

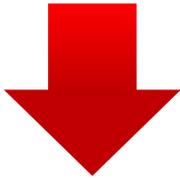
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Do denominal and deverbal derivatives show the same degree of semantic similarity to their bases?



no
for *-ee*



yes
for *-ment*



yes
for *-ation*

Discussion

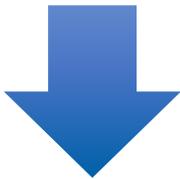
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Discussion

RQ2

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-ee

Word class of base
Base polysemy
Semantic co-activation



-ment

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THANK YOU!

References

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Thank you!

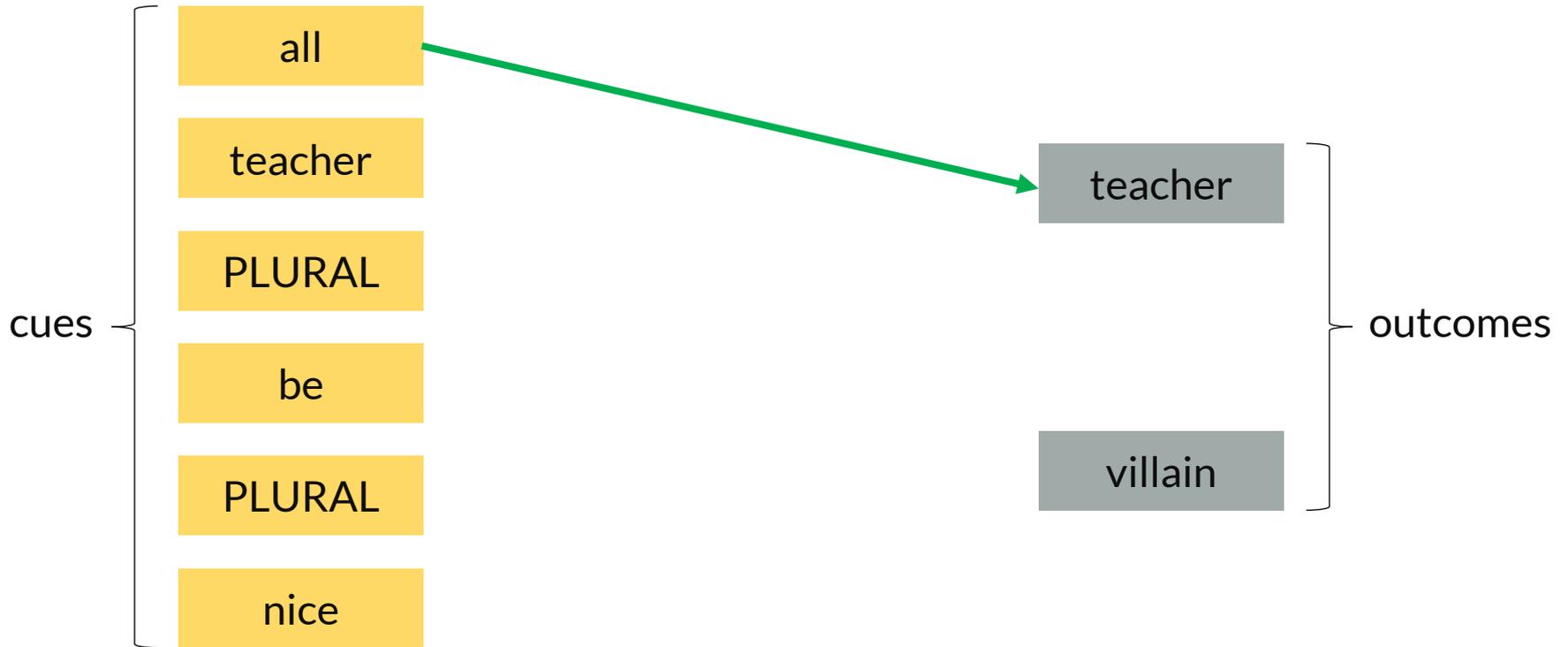
Method



Example: *All teachers are nice.*

	all	teacher	PLURAL	be	nice	villain	evil
teacher							
villain							

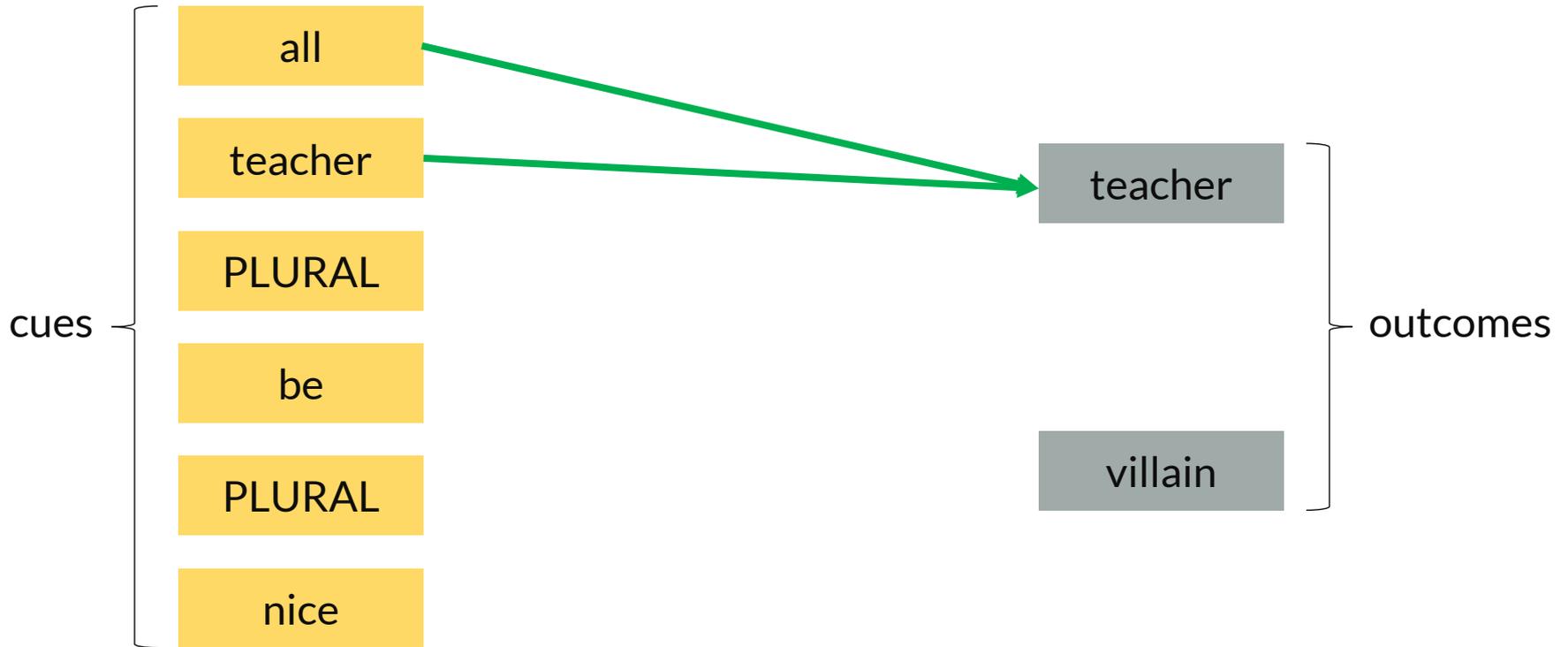
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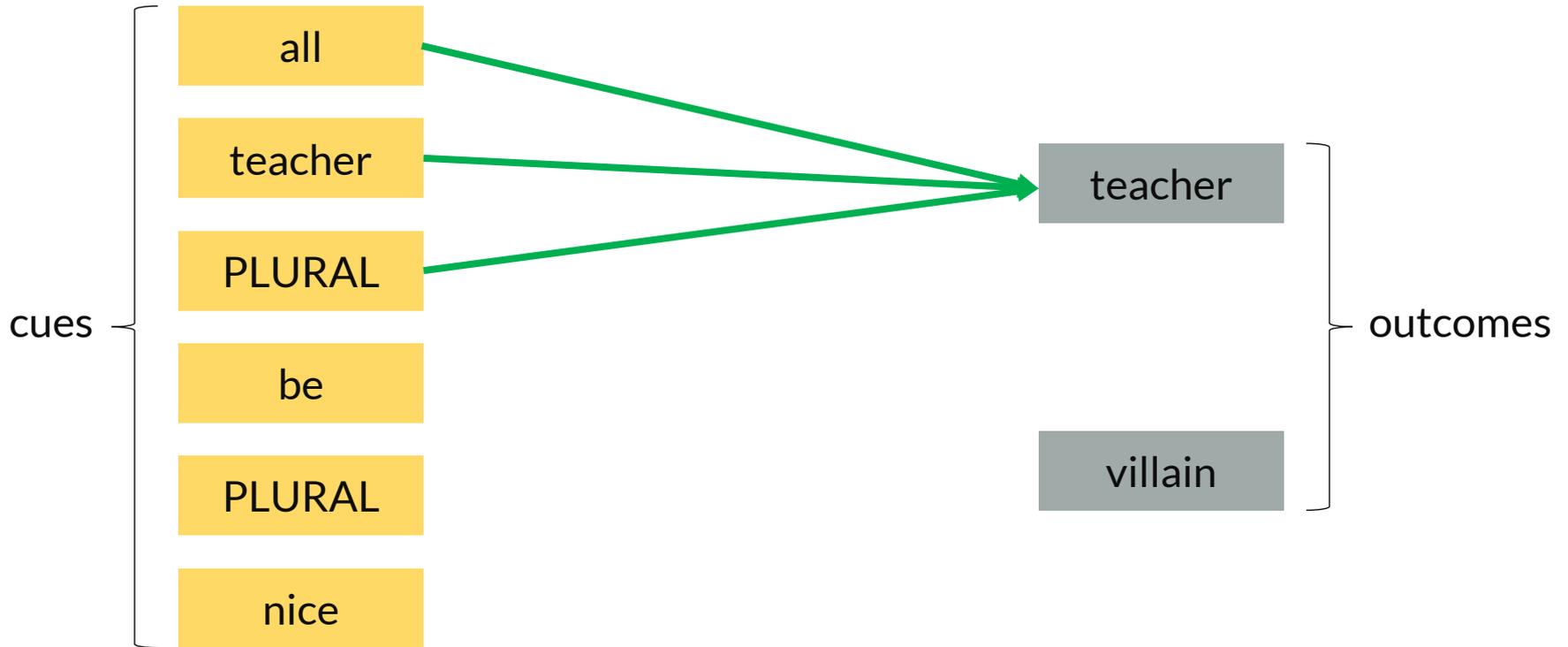
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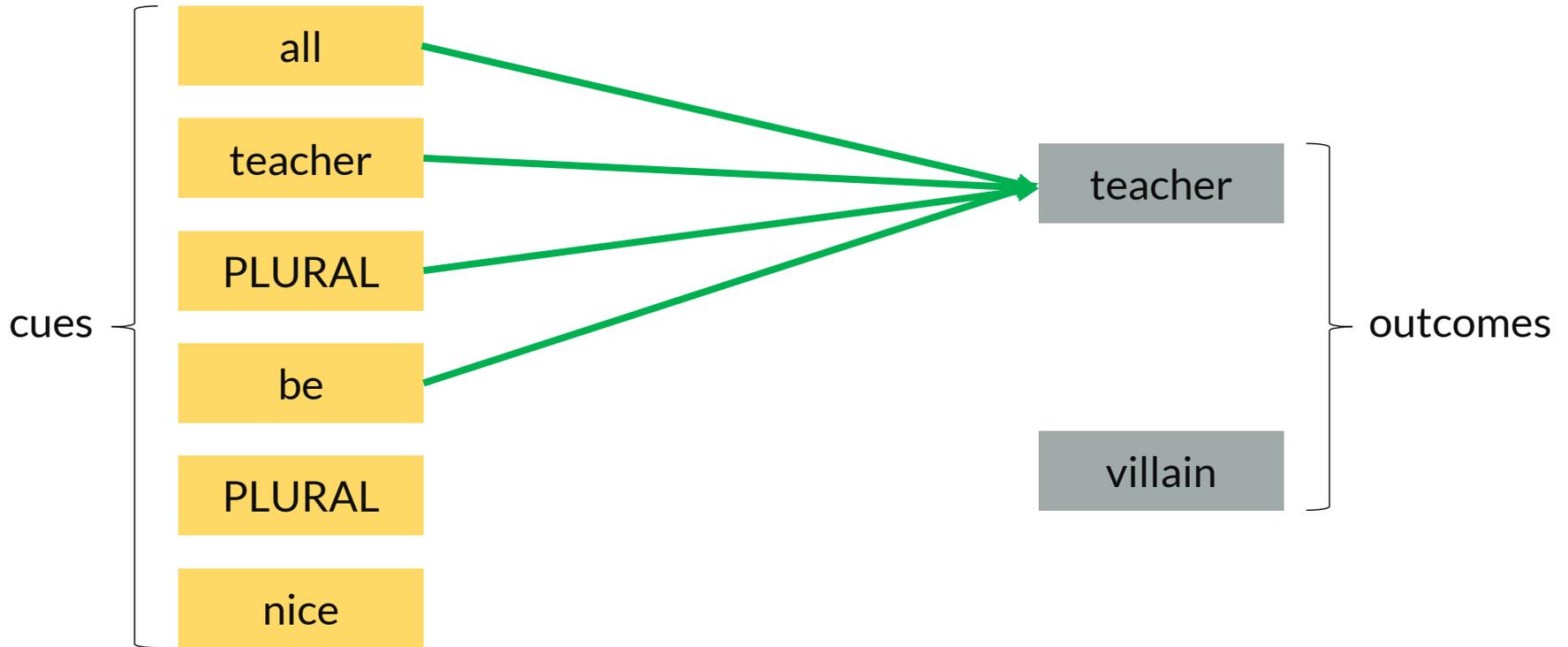
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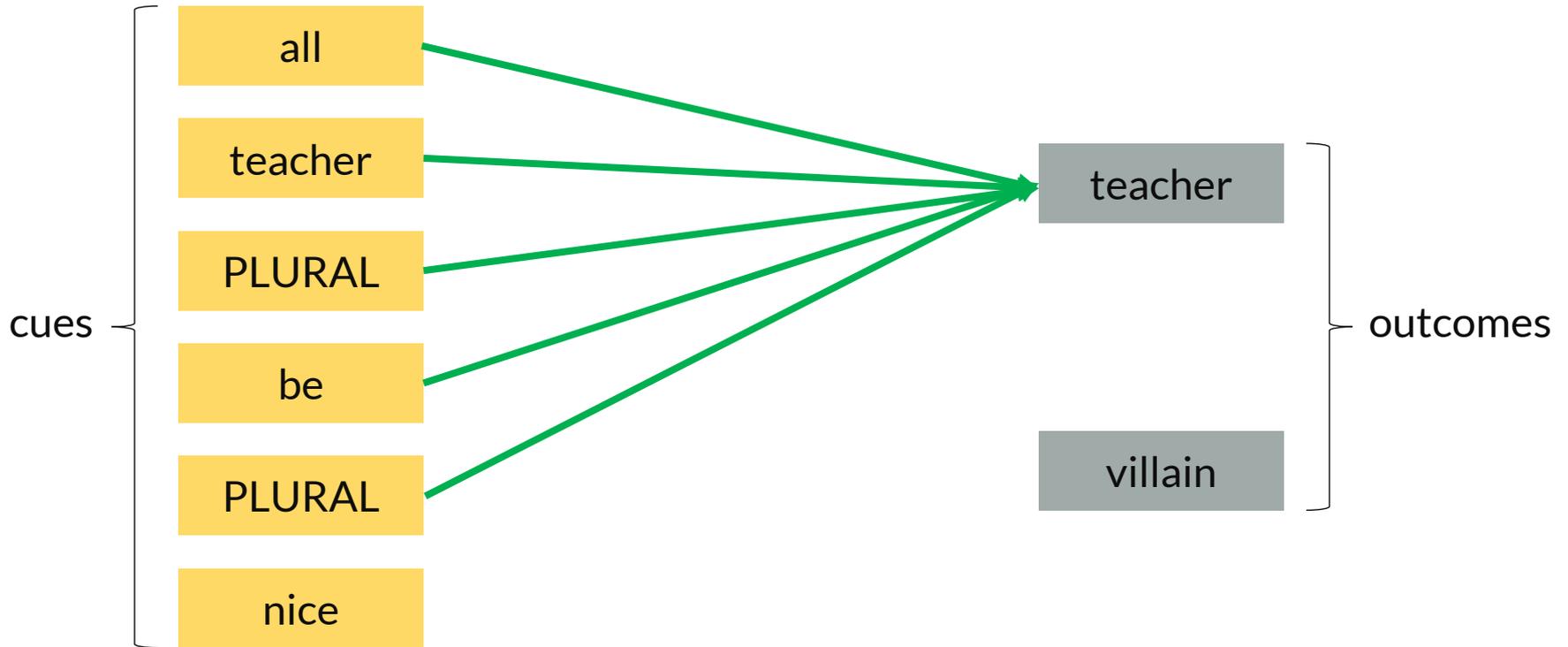
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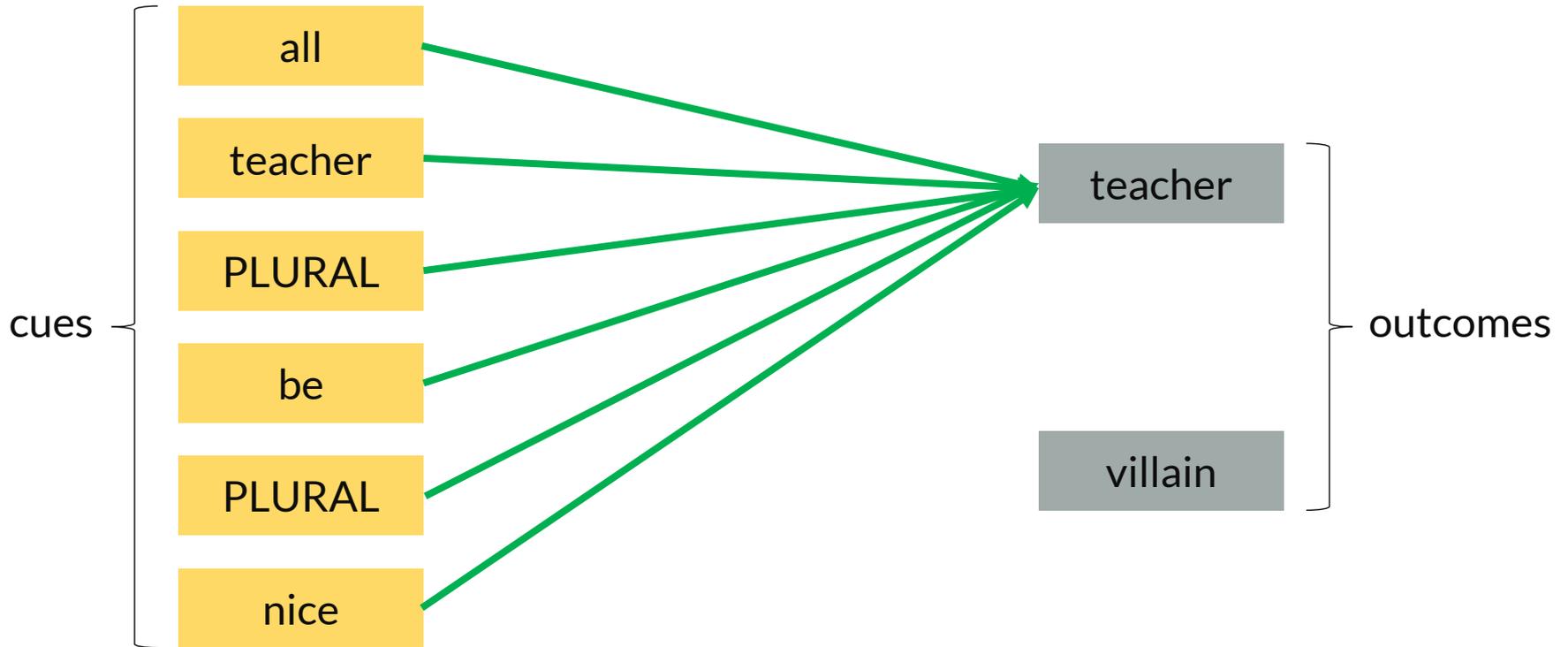
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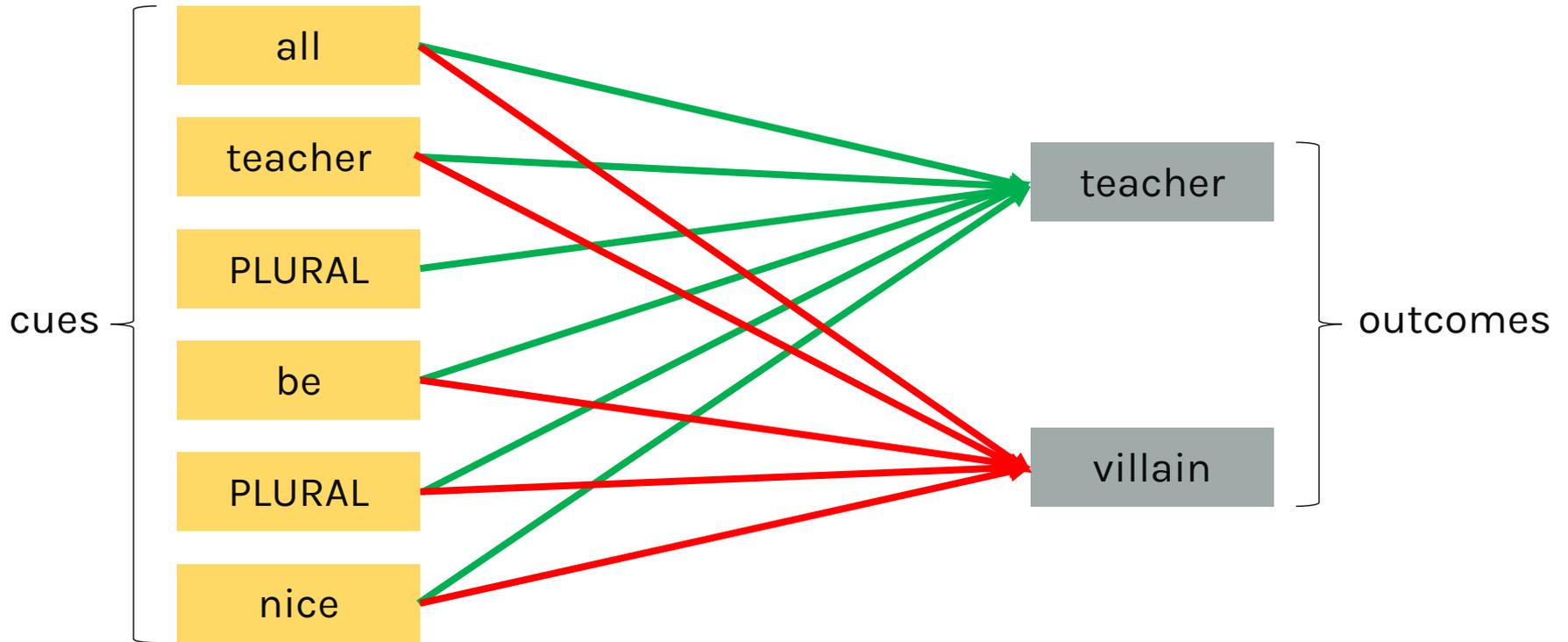
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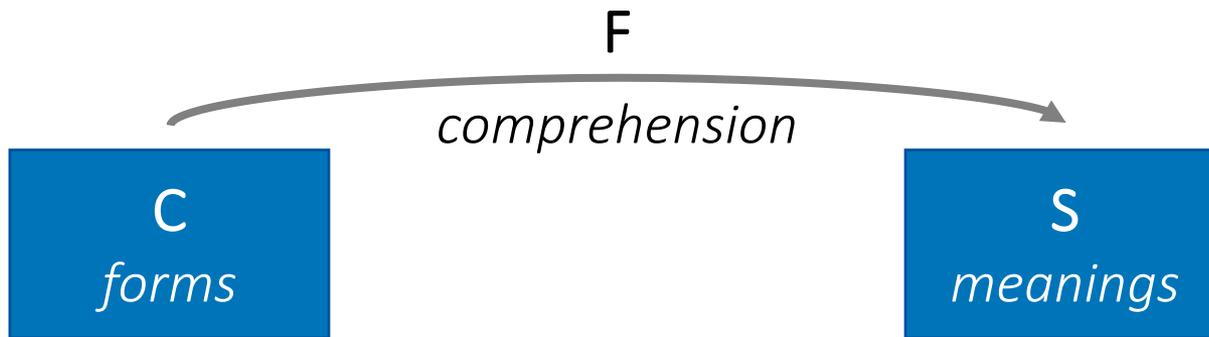
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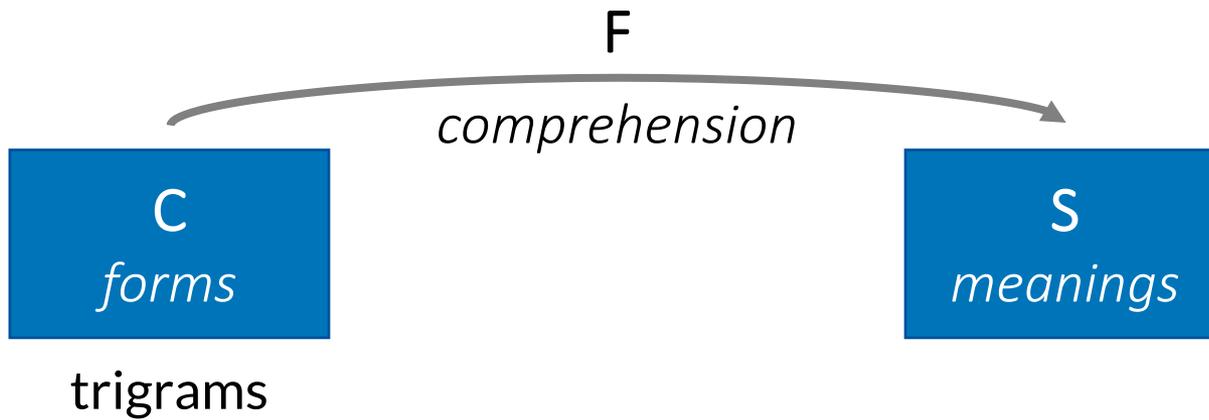
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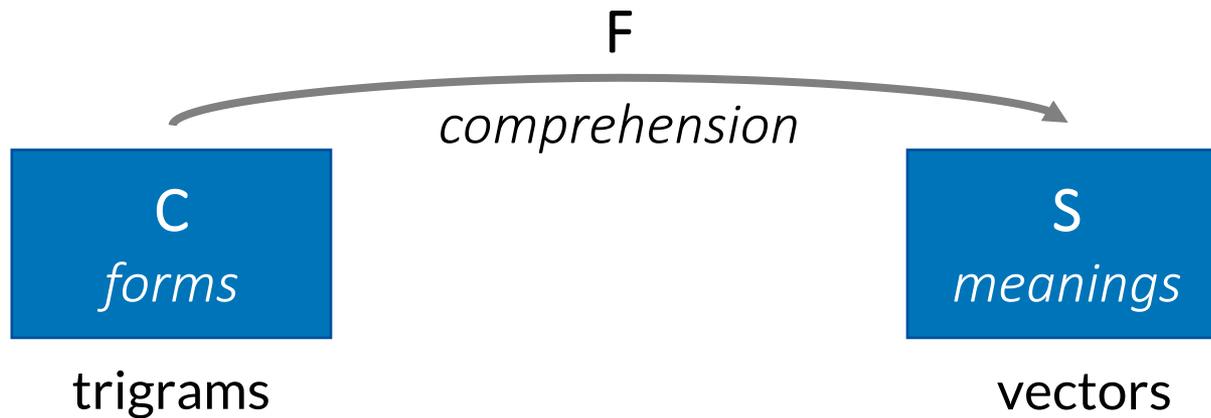
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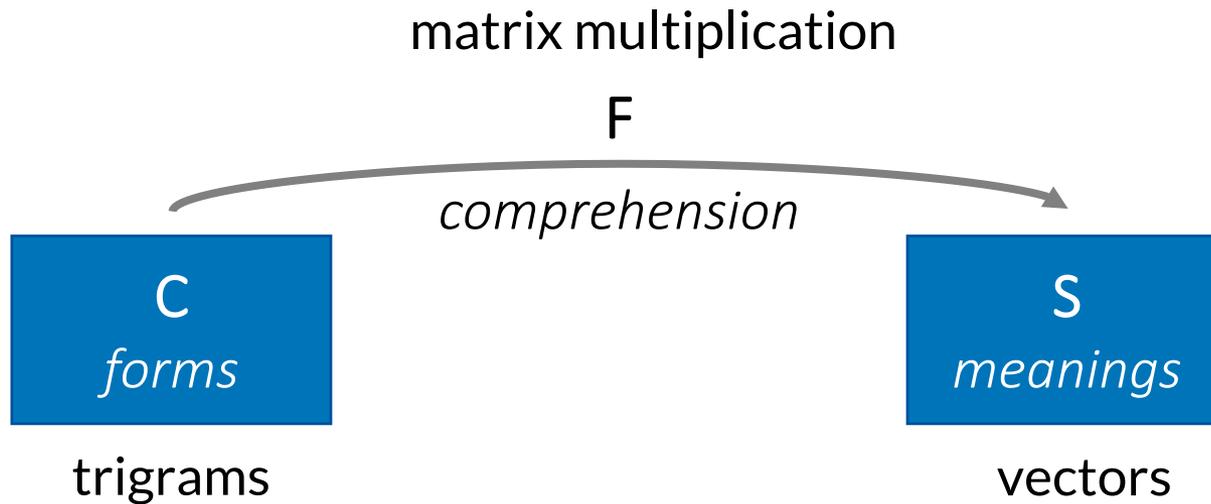
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