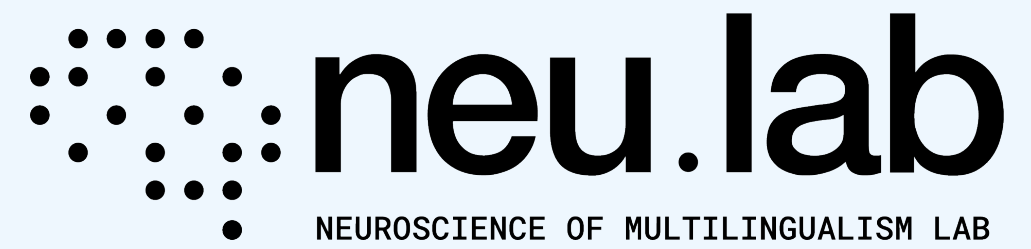




NYU



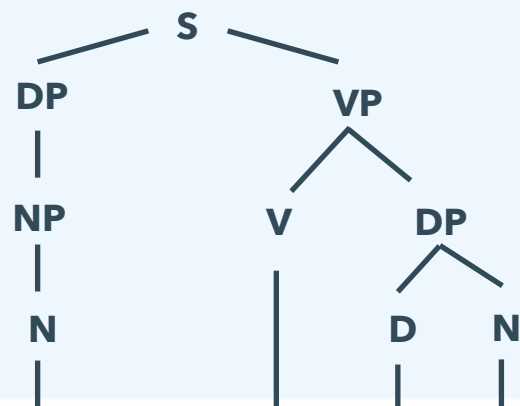
Elebitasuna eta neuropsikologia

Esti Blanco-Elorrieta

New York University

ENG

syntax



morphemes

alice open | ed the door

syllables

'æ ləs 'oʊ pənd ðə dɔr

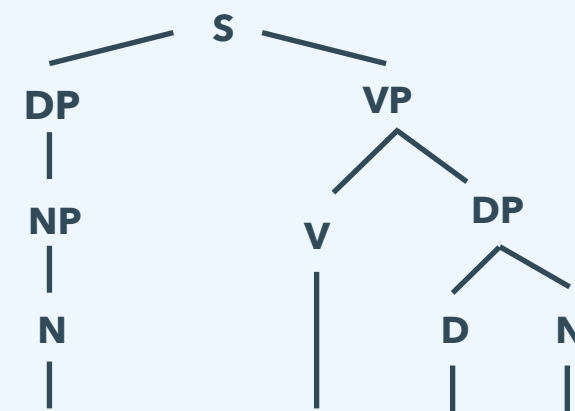
phonemes

'æ l ə s 'oʊ p ə n d ð ə d ɔ r

acoustics



SPA



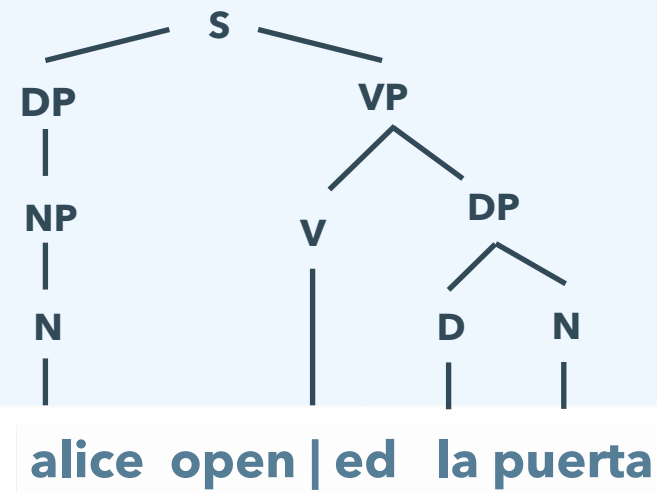
alicia abri | ó la puerta

a 'li θja a β'rjo la 'pwer ta

a 'l i θ j a a β 'r j o l a 'p w e r t a



Sistema bakarra



'ae ləs 'oʊ pənd la 'pwer ta

'æ l ə s 'oʊ p ə n d l ə 'p w e r t ə



Sistema bakarra

Sistema bakarra

	Language A	Language B
Syntax		
Semantic		
Morphological		
Phonological		

Sistema bakarra

	Language A	Language B
Syntax	10	10
Semantic	10	10
Morphological	10	10
Phonological		

Sistema bakarra

	Language A	Language B
Syntax	10	10
Semantic	10	10
Morphological	10	10
Phonological	20	20

Sistema bakarra

	Language A	Language B
Syntax	10	10
Semantic	10	10
Morphological	10	10
Phonological	20	20

x2

Sistema bakarra

	Language A	Language B
Syntax	10	10
Semantic	10	10
Morphological	10	10
Phonological	20	20

x2

Kualitatiboki antzeko defizita

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

- Kualitatiboki* antzeko defizita
- Kuantitatiboki* dominantziaren arabera
- Code-switching hizkuntza nagusira

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Sistema banatuak

- Kualitatiboki* antzeko defizita
- Kuantitatiboki* dominantziaren arabera
- Code-switching hizkuntza nagusira

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Sistema banatuak

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

Sistema bakarra

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Sistema banatuak

	Dominant Language	Non-Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

Kualitatiboki
ETA
kuantitatiboki
defizit ezberdinak





AphasiaBank protokoloa



AphasiaBank protokoloa

~30 minutu



AphasiaBank protokoloa

~30 minutu

13 PwA



AphasiaBank protokoloa

~30 minutu

13 PwA

Ptp1
Ptp2
Ptp3
Ptp4
Ptp5
Ptp6
⋮
Ptp13



AphasiaBank protokoloa

~30 minutu

13 PwA

	Prof_{self-report}
Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
⋮	
Ptp13	5



AphasiaBank protokoloa

~30 minutu

13 PwA

Proficiency

10

0



Prof_{self-report}

Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
⋮	
Ptp13	5



AphasiaBank protokoloa

~30 minutu

13 PwA

Proficiency



Prof_{self-report}

Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
...	
Ptp13	5



13 PwA

Proficiency

10

0

- Ptp1
- Ptp2
- Ptp5
- Ptp3
- Ptp7
- Ptp4
- Ptp6
- Ptp11
- Ptp9
- Ptp8
- Ptp13
- Ptp10
- Ptp12

Prof_{self-report}

Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
...	
Ptp13	5



AphasiaBank protokoloa

13 PwA

Proficiency

10

0



Prof_{self-report}

Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
...	
Ptp13	5



AphasiaBank protokoloa

~30 minutu

13 PwA

Proficiency

10

0

Ptp1

Ptp2

Ptp5

Ptp3

Ptp7

Ptp4

Ptp6

Ptp11

Ptp9

Ptp8

Ptp13

Ptp10

Ptp12

Prof_{self-report}

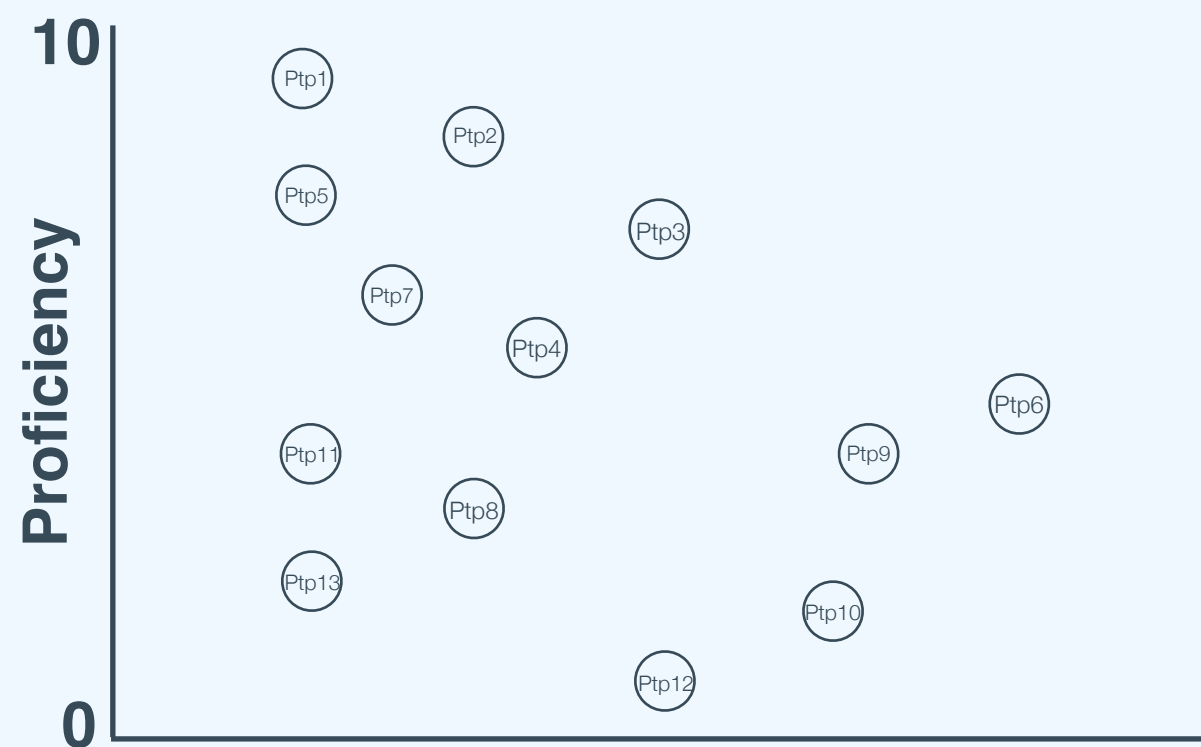
Ptp1	9
Ptp2	4
Ptp3	7
Ptp4	8
Ptp5	2
Ptp6	6
...	
Ptp13	5



AphasiaBank protokoloa

~30 minutu

13 PwA



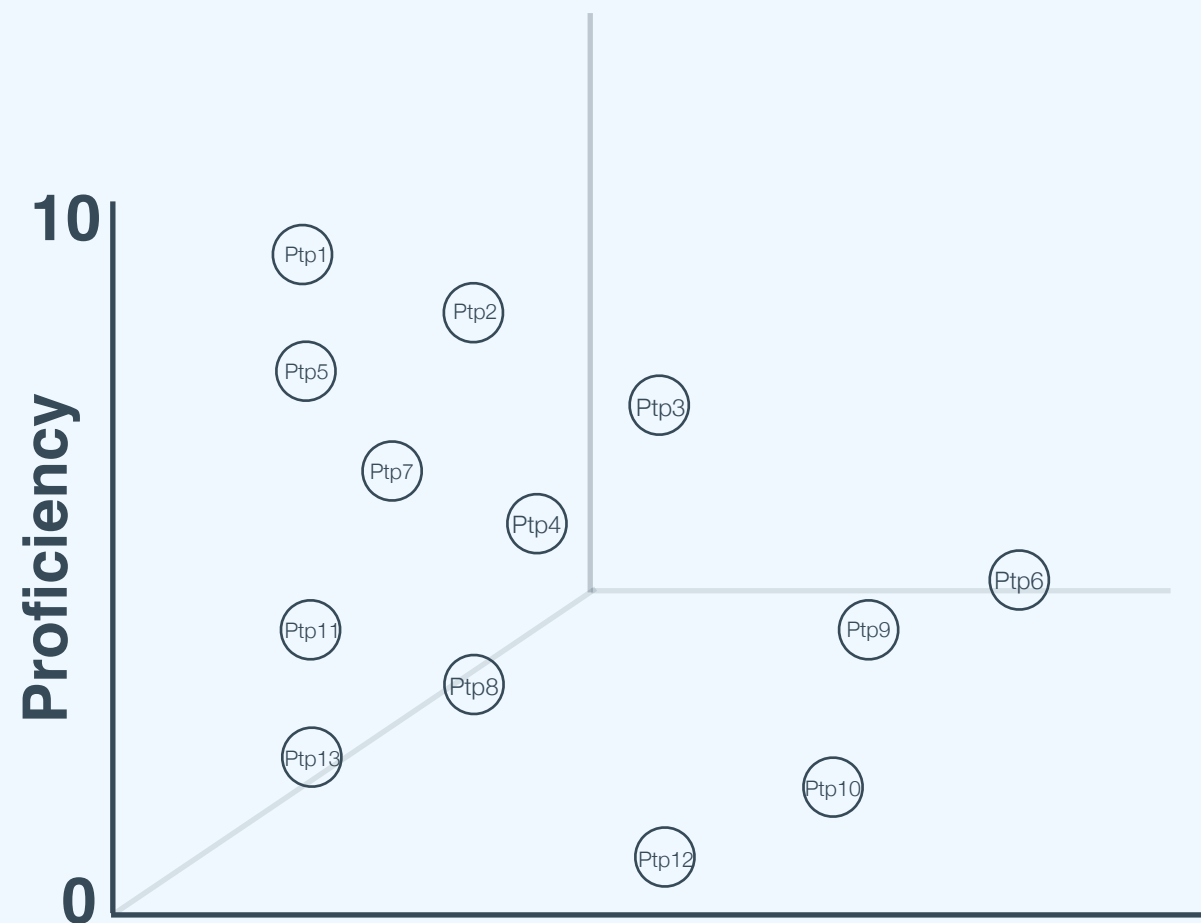
	Prof _{self-report}	Age of A
Ptp1	9	1
Ptp2	4	3
Ptp3	7	7
Ptp4	8	9
Ptp5	2	5
Ptp6	6	8
⋮		
Ptp13	5	25



AphasiaBank protokoloa

~30 minutu

13 PwA



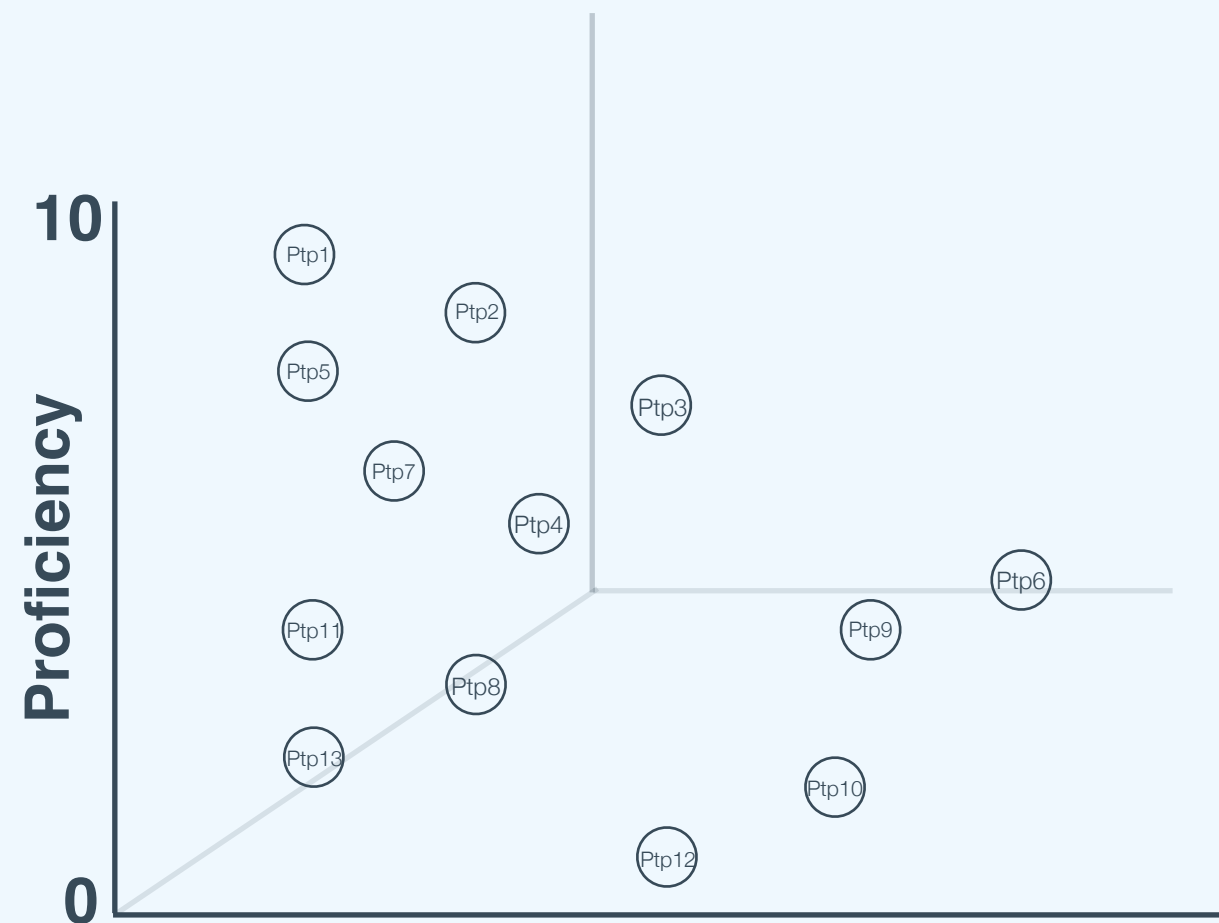
	Prof_{self-report}	Age of A	Exp.
Ptp1	9	1	8
Ptp2	4	3	6
Ptp3	7	7	8
Ptp4	8	9	6
Ptp5	2	5	1
Ptp6	6	8	4
⋮			
Ptp13	5	25	6



AphasiaBank protokoloa

~30 minutu

13 PwA



	Prof _{self-report}	Age of A	Exp.
Ptp1	9	1	8
Ptp2	4	3	6
Ptp3	7	7	8
Ptp4	8	9	6
Ptp5	2	5	1
Ptp6	6	8	4
⋮			
Ptp13	5	25	6

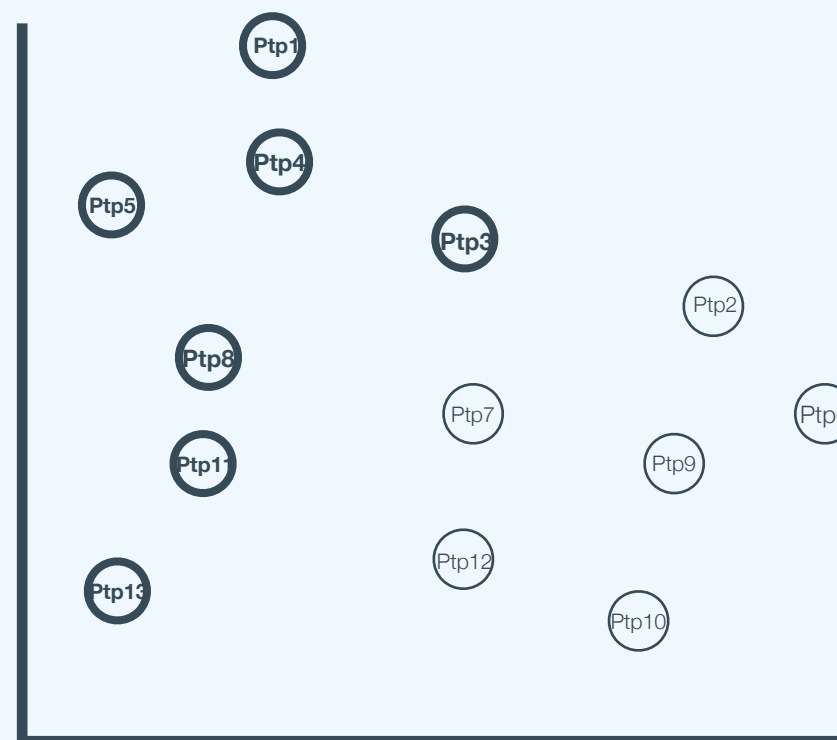


AphasiaBank protokoloa

~30 minutu

13 PwA

K-means clustering



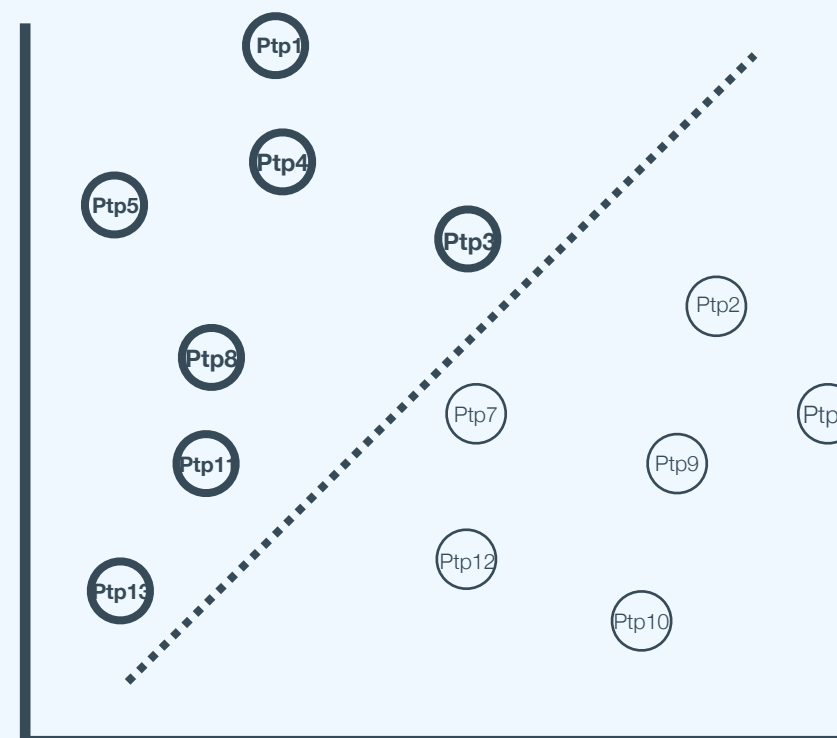


AphasiaBank protokoloa

~30 minutu

13 PwA

K-means clustering



○ Spanish Dominant

○ English Dominant



AphasiaBank protokoloa

~30 minutu

13 PwA

Transkripzioa







Syntactic Error
the [:dog] was barking

Semantic Error
cat [:dog]



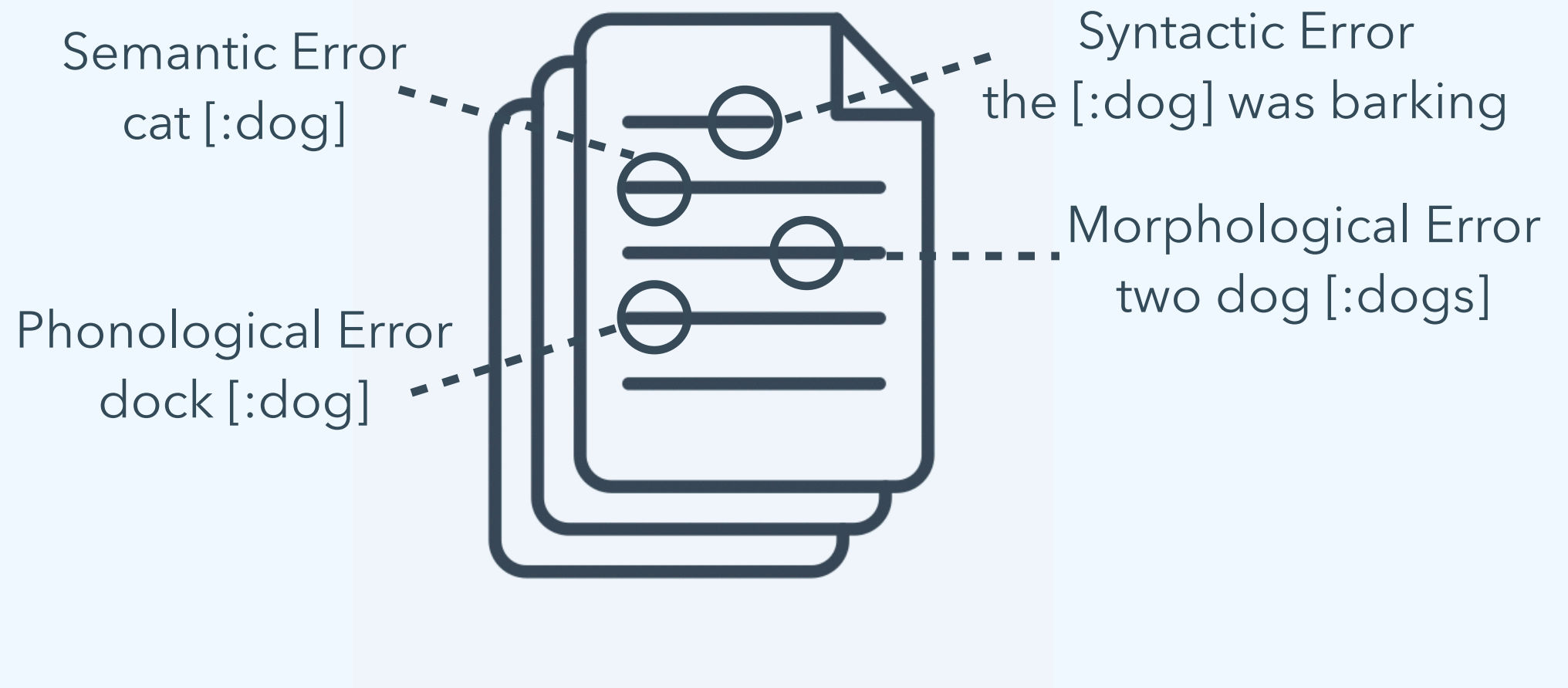
Syntactic Error
the [:dog] was barking

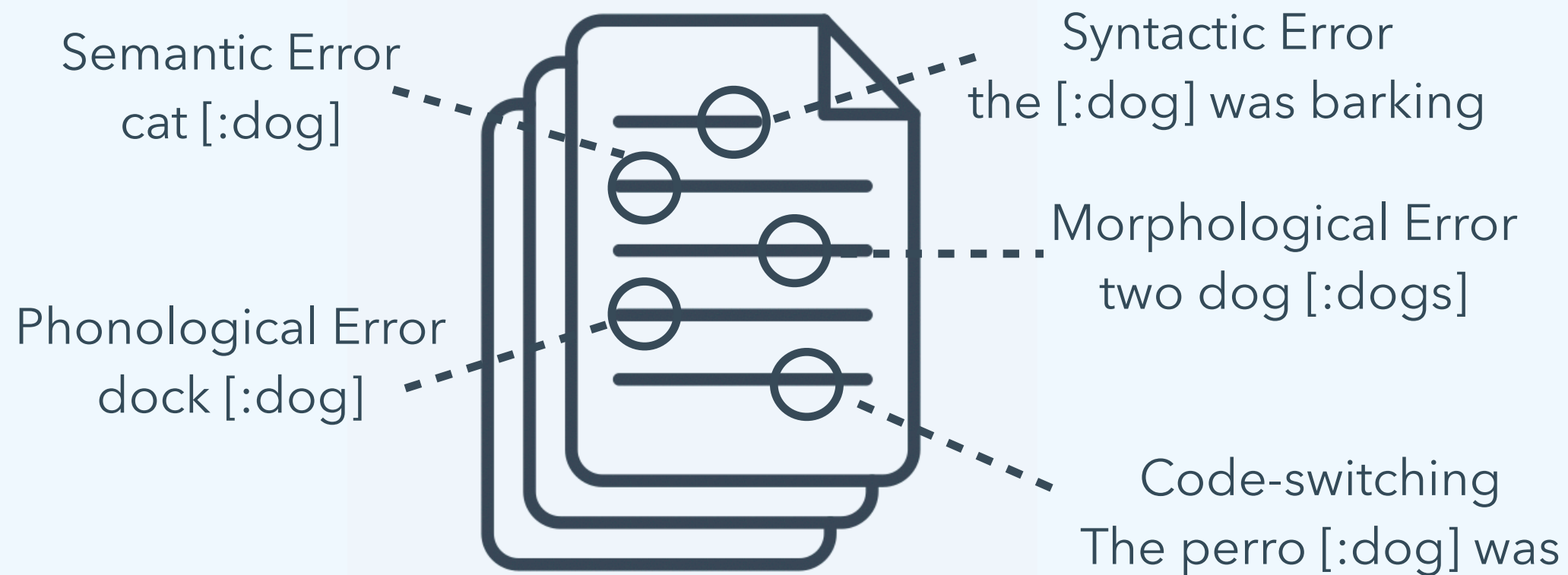
Semantic Error
cat [:dog]

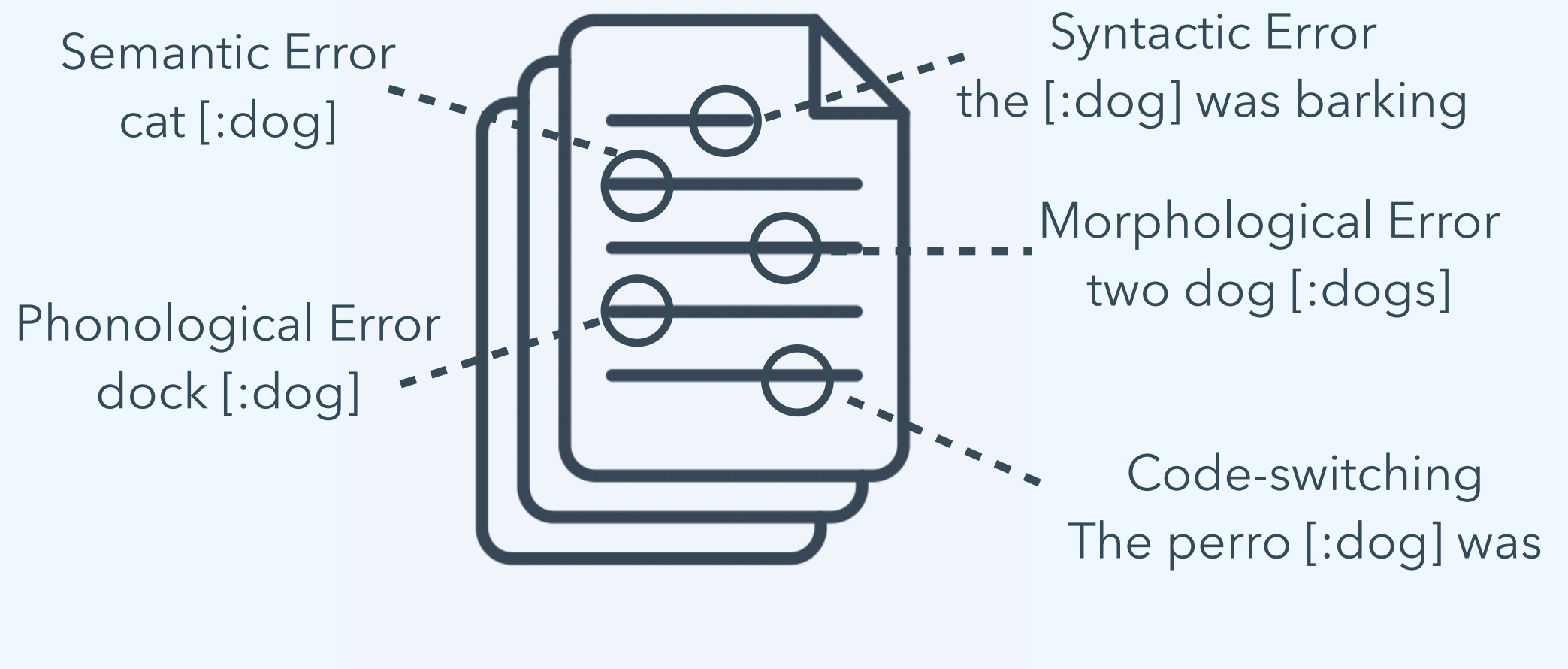


Syntactic Error
the [:dog] was barking

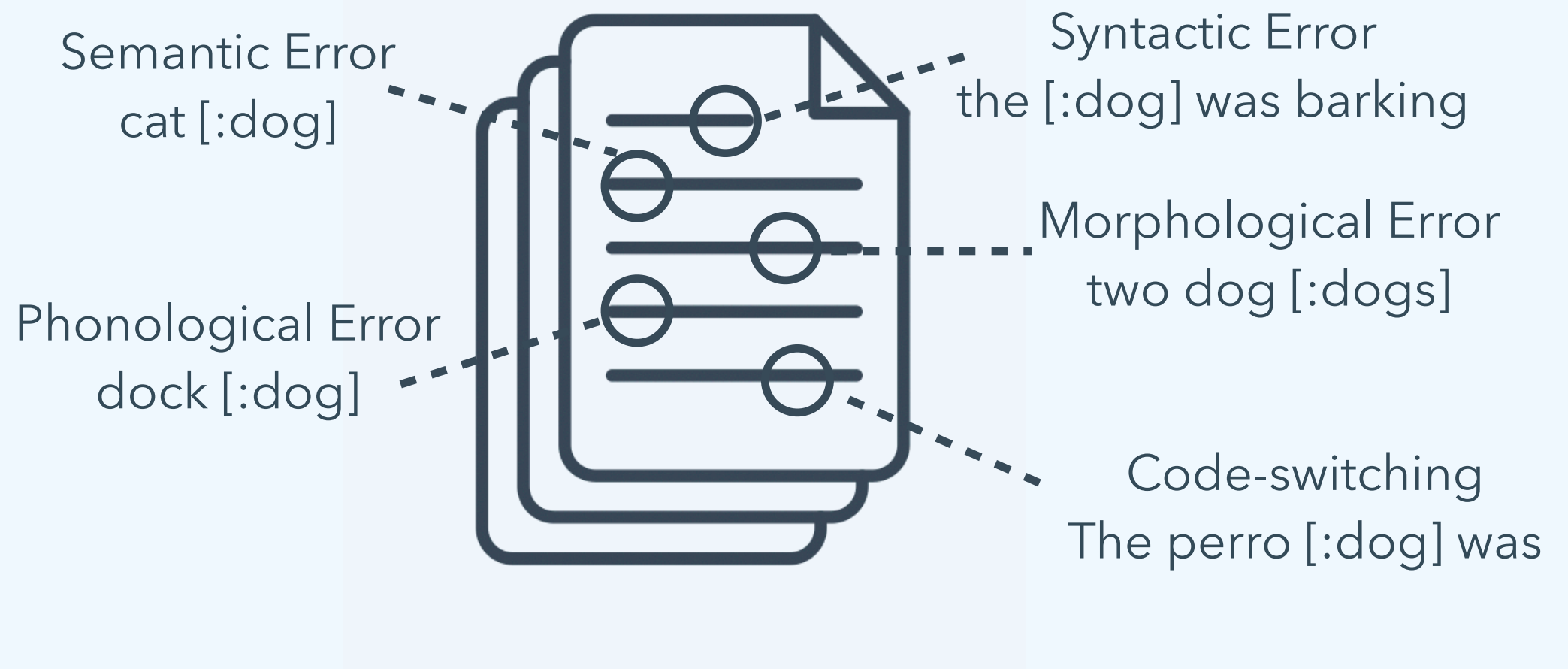
Morphological Error
two dog [:dogs]



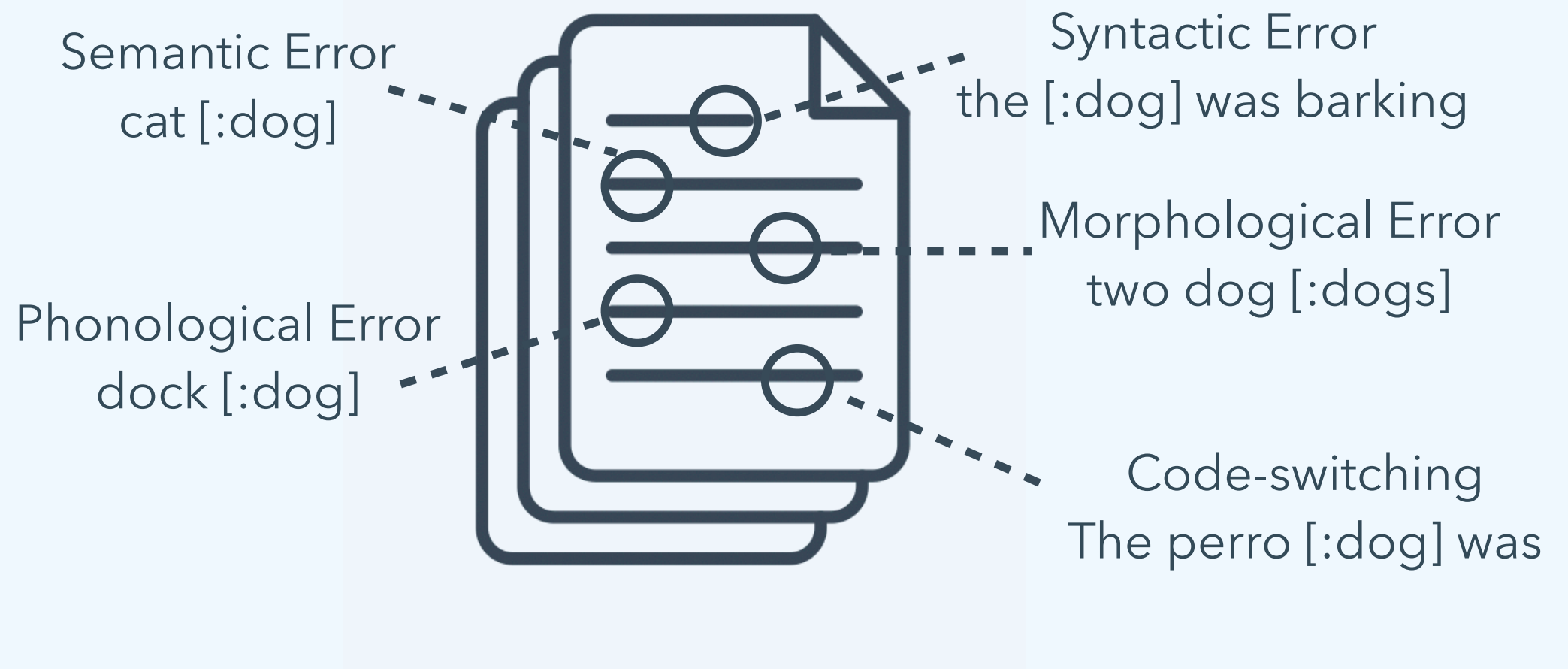




Word class: noun, verb, pronoun, preposition, etc.



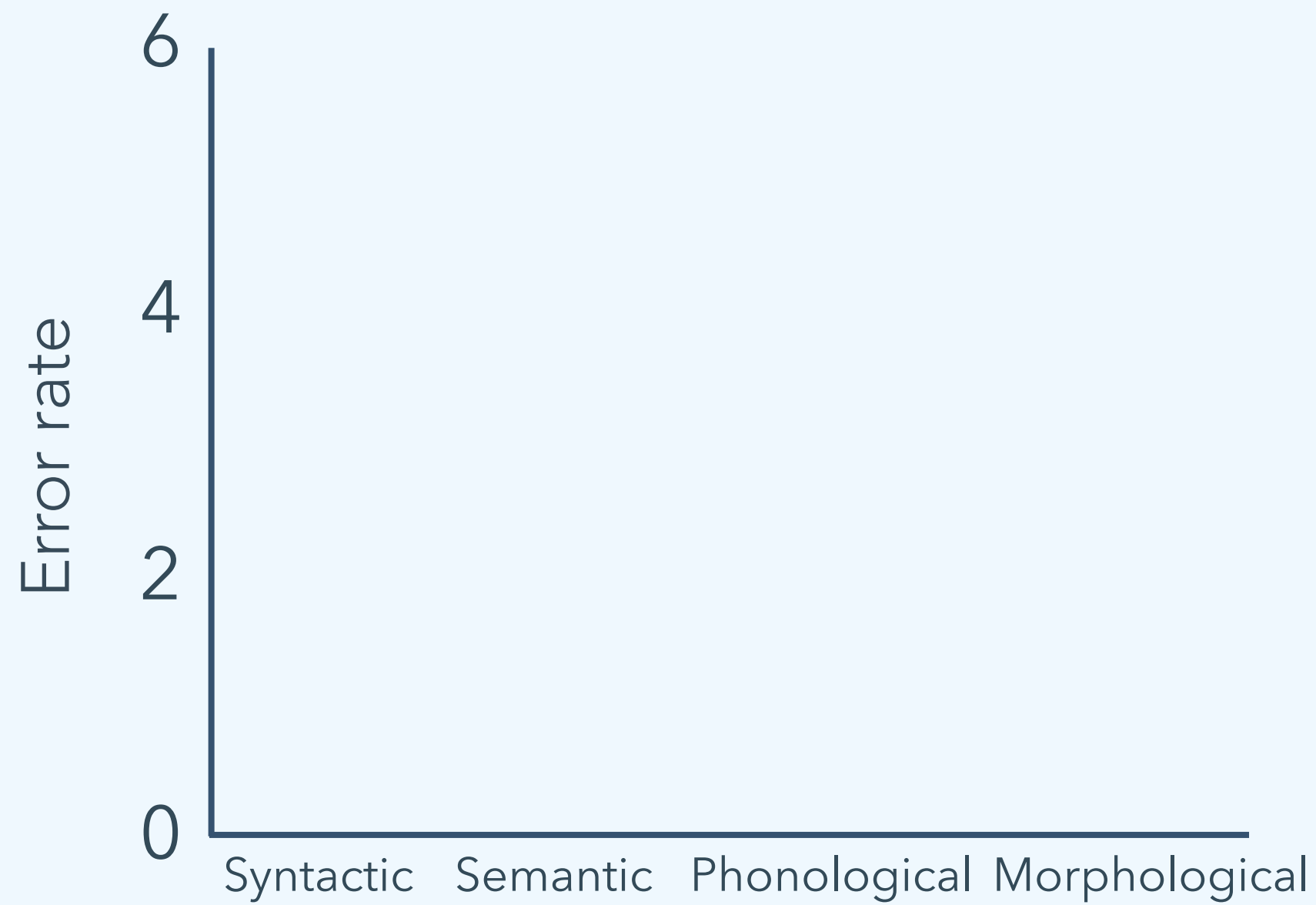
Word class: noun, verb, pronoun, preposition, etc.
Error type: addition, omission, substitution



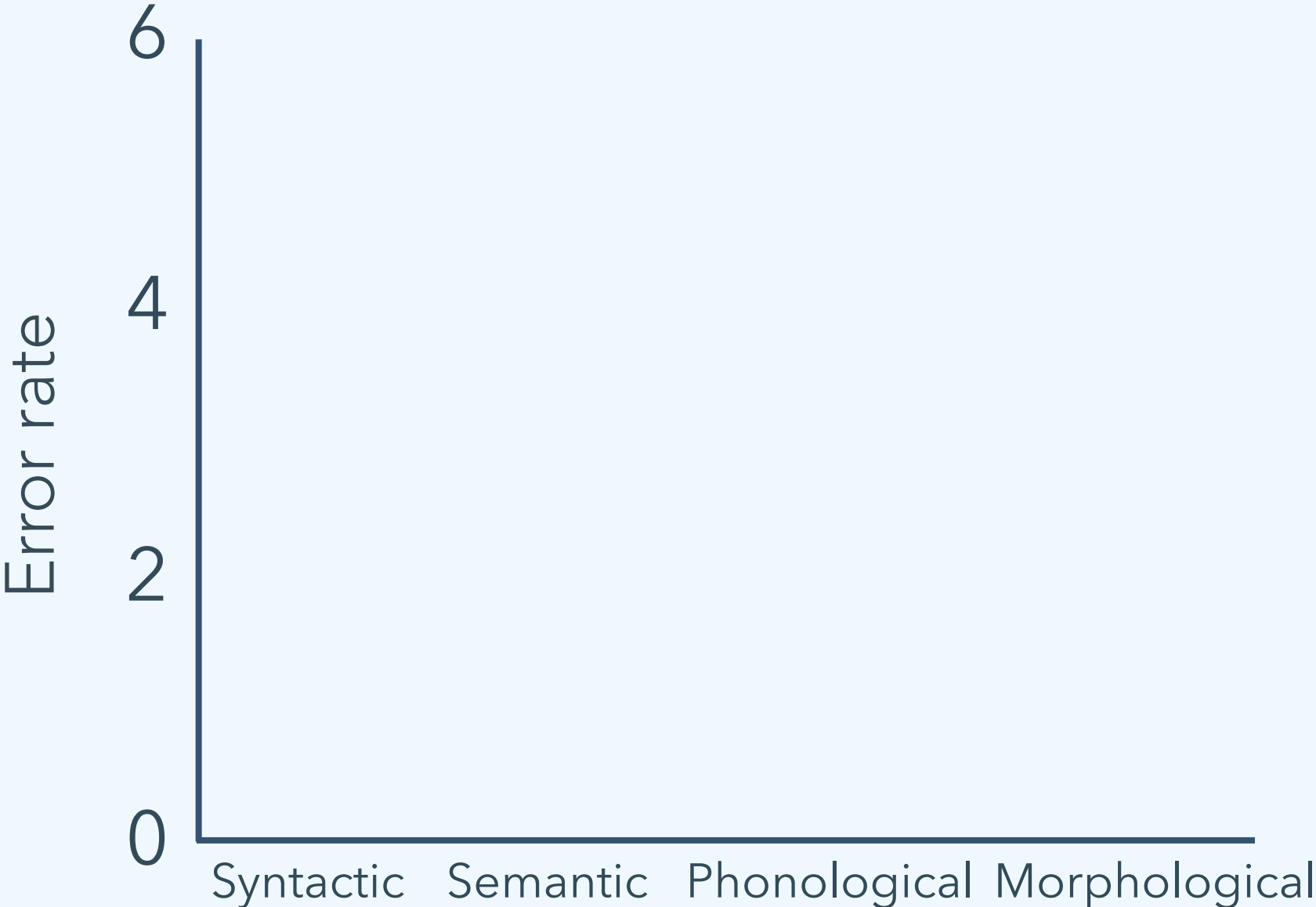
Word class: noun, verb, pronoun, preposition, etc.

Error type: addition, omission, substitution

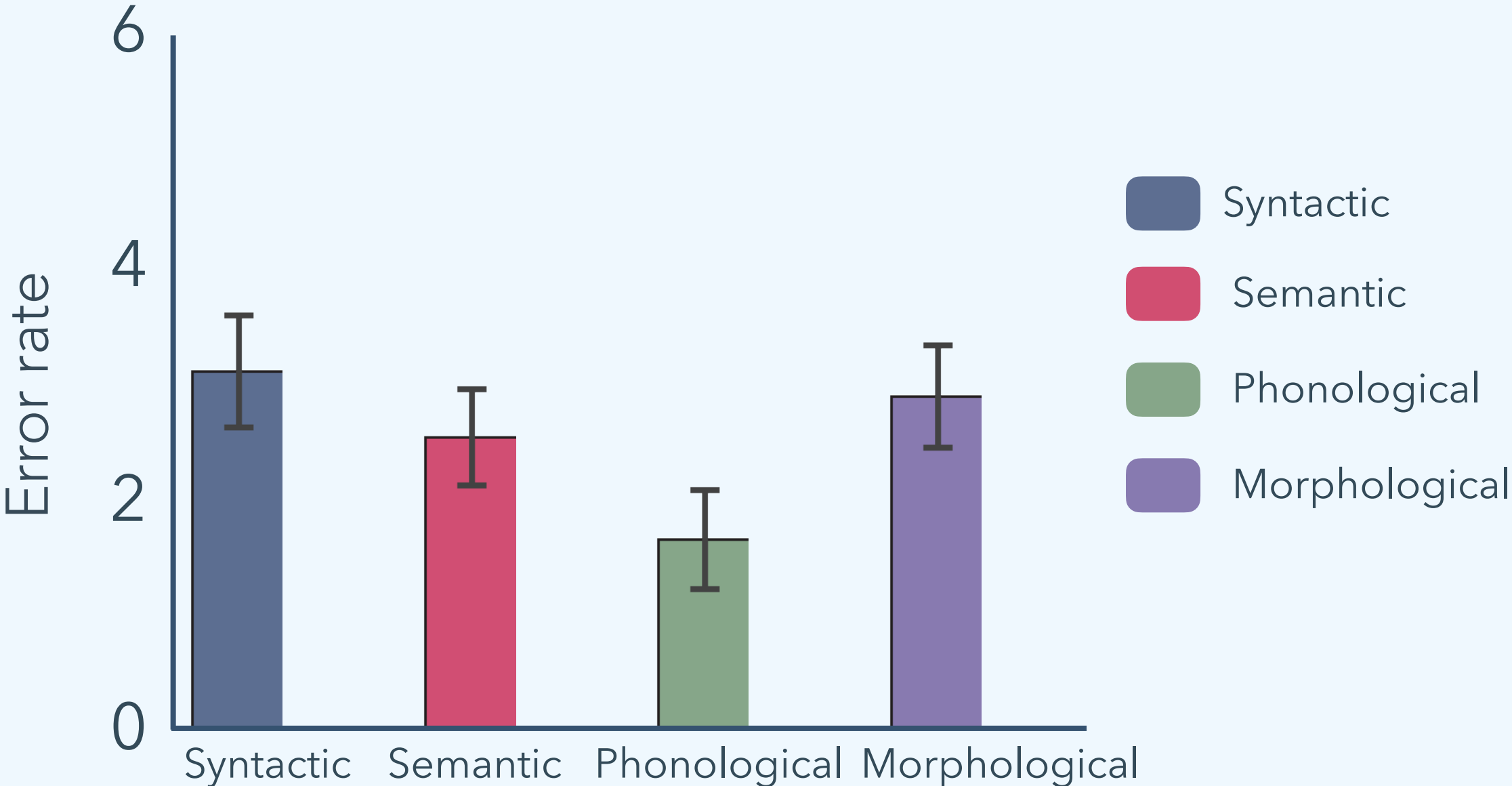
$$\text{Normalized error} = \frac{\# \text{ errors produced}}{\text{total \# words produced}}$$

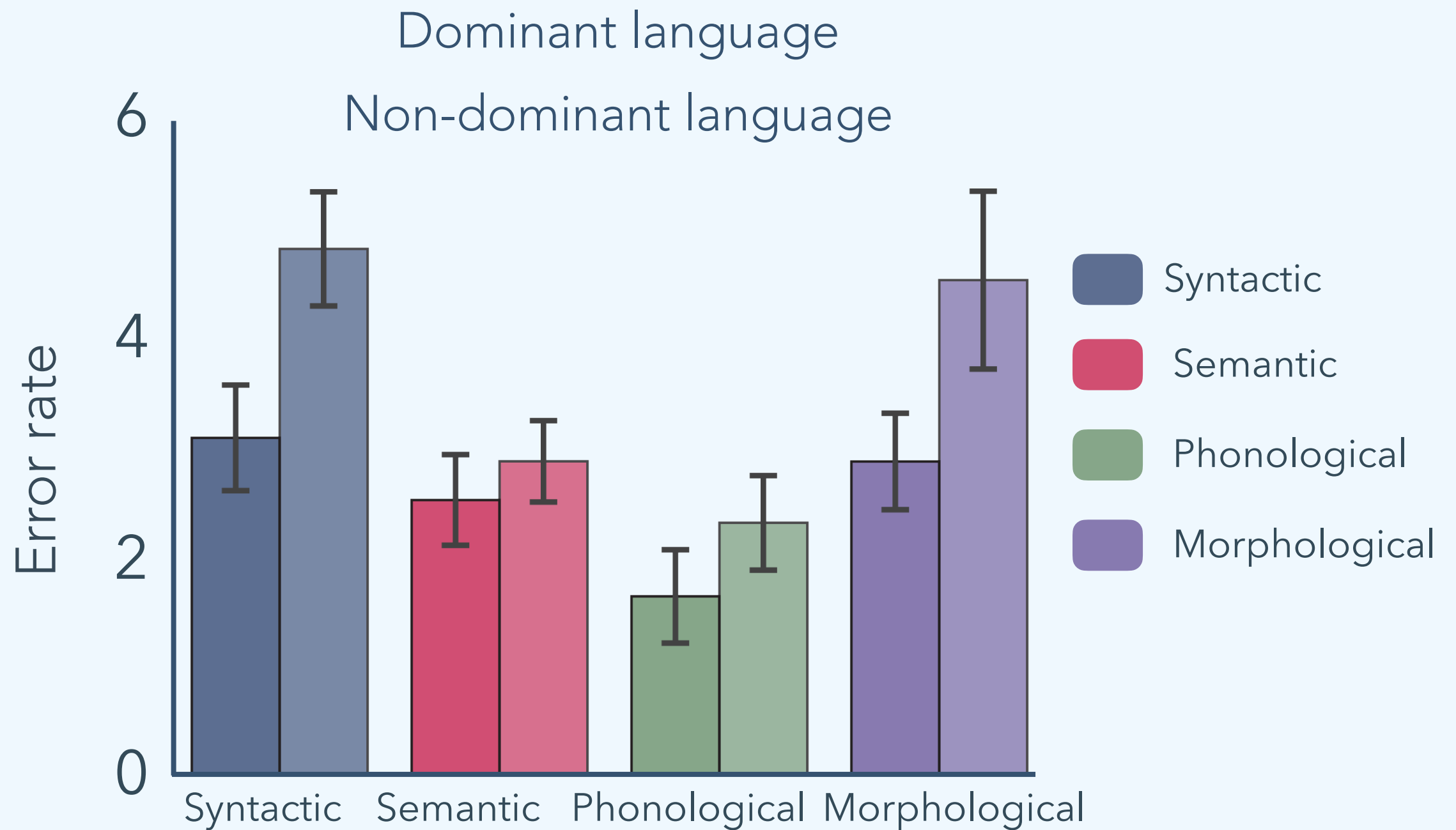


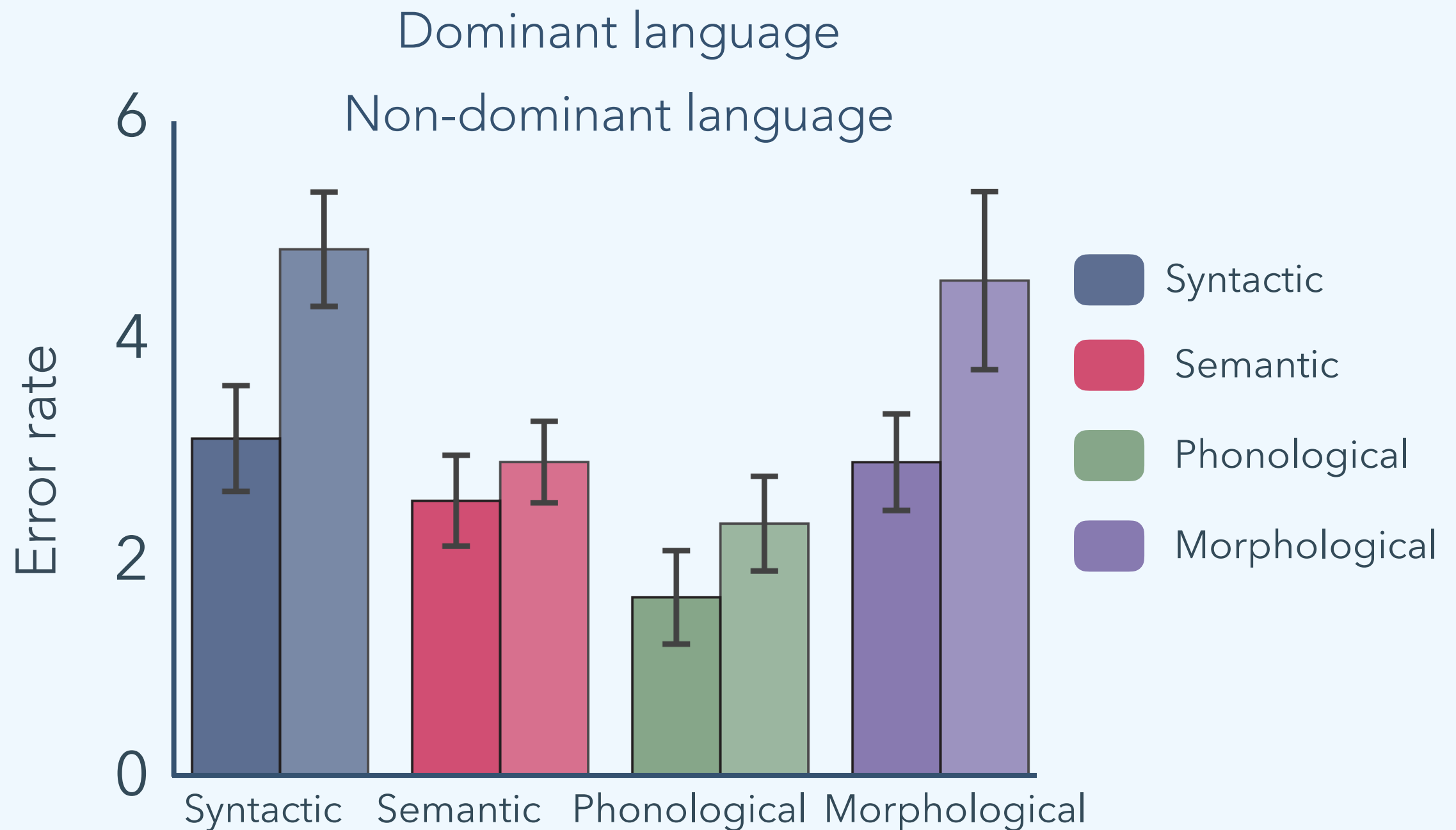
Dominant language



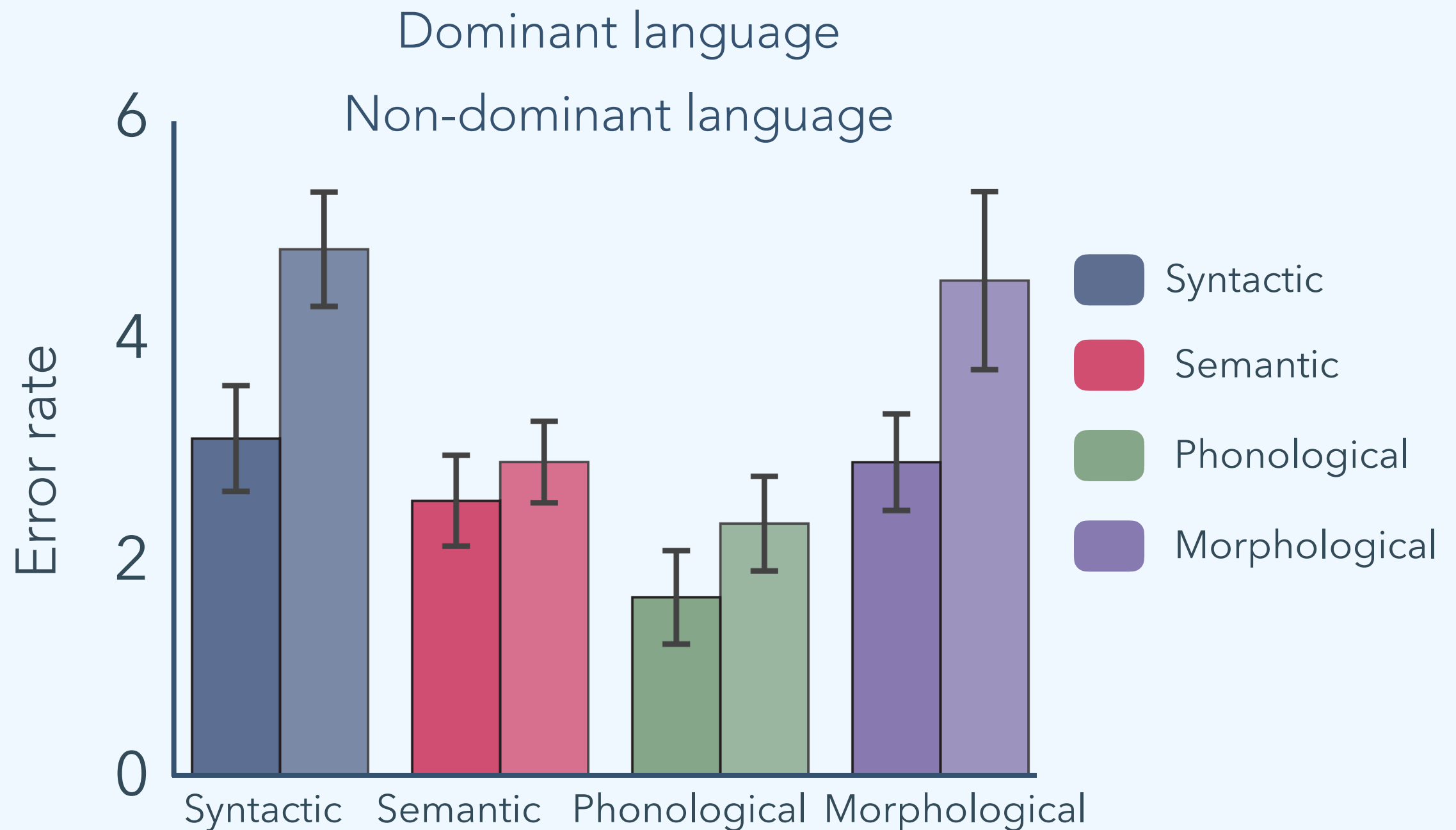
Dominant language





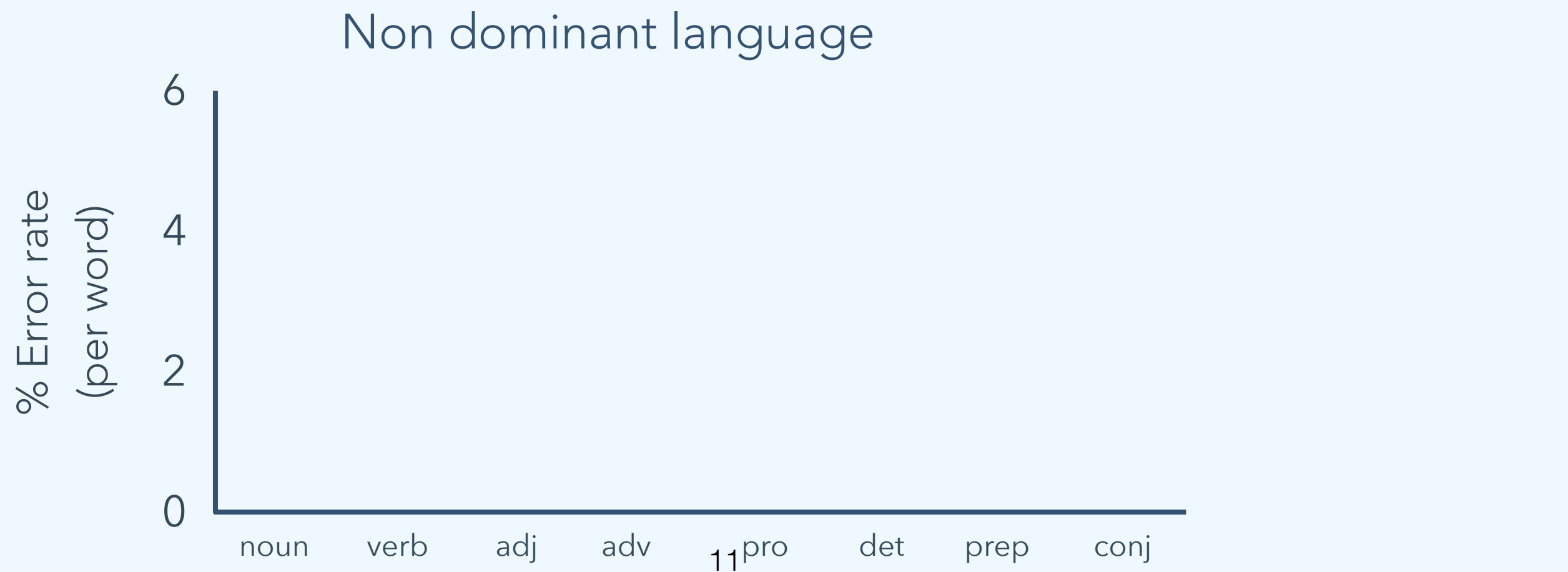


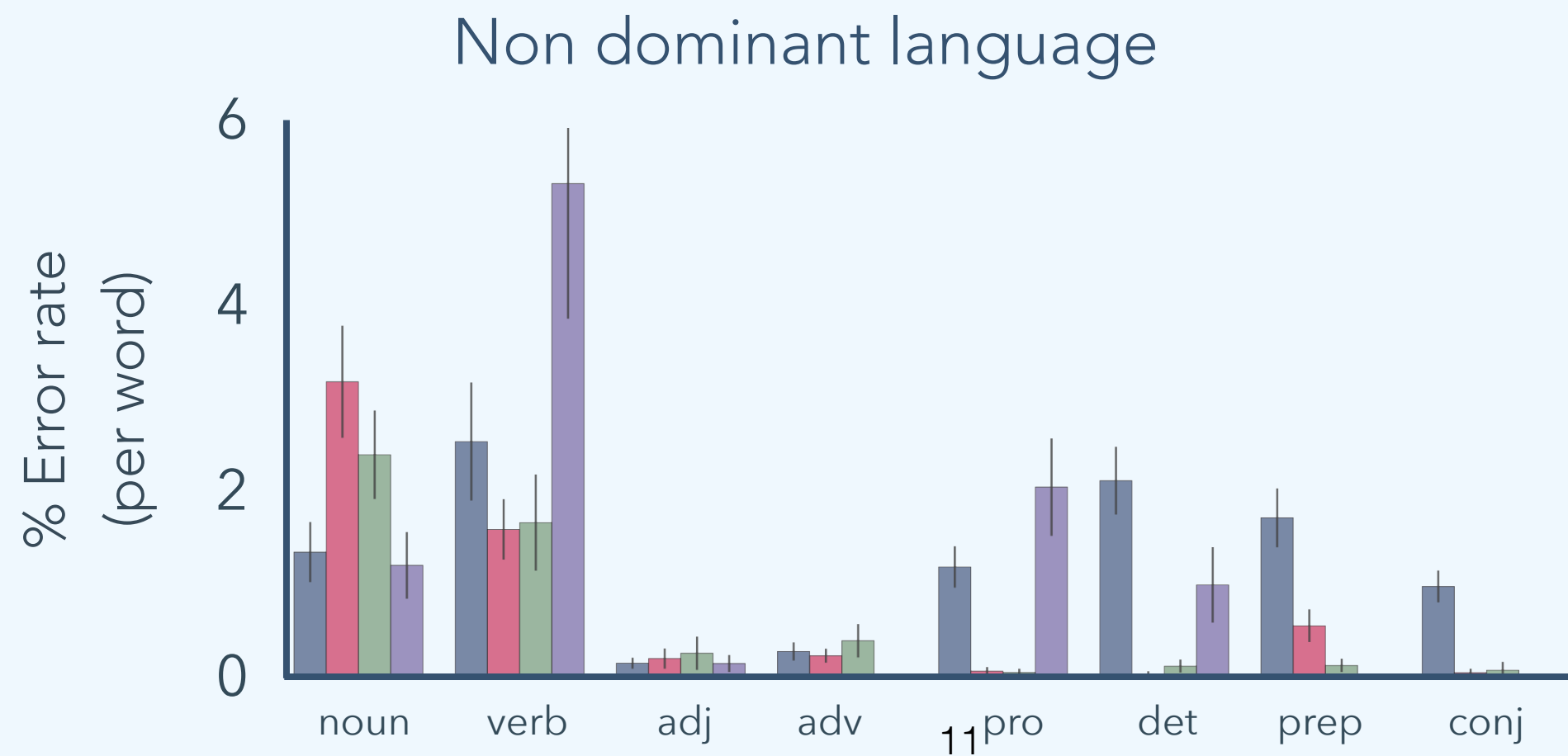
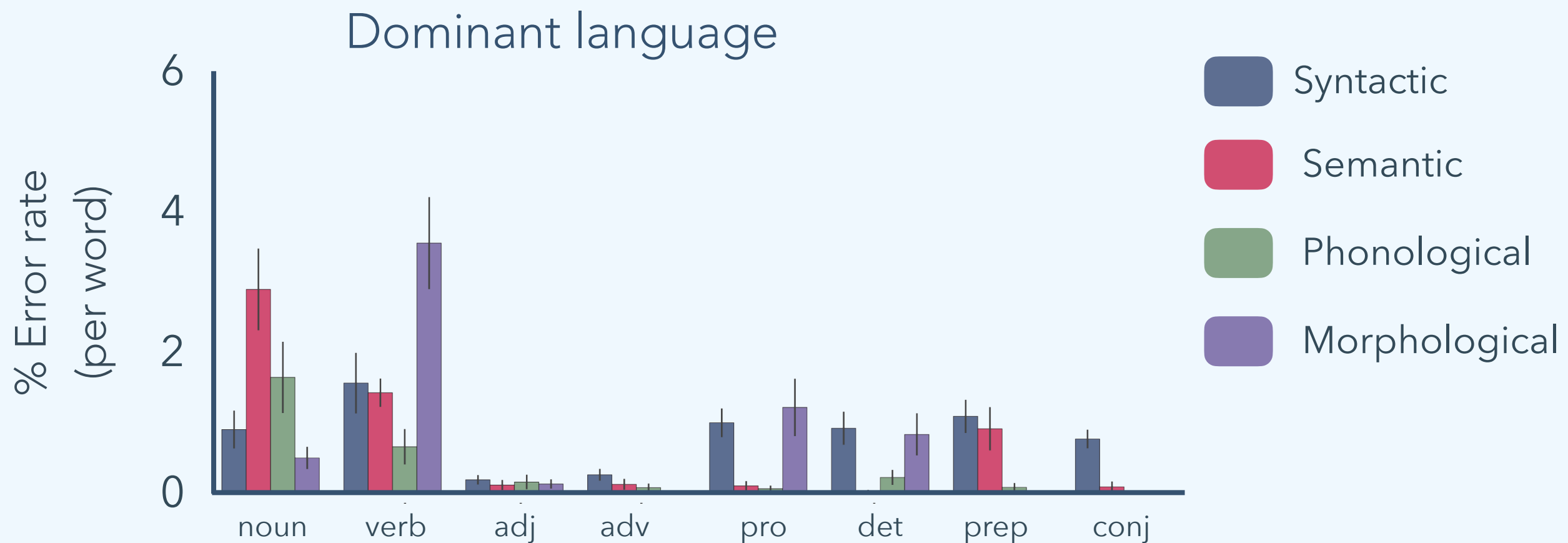
Uneven **quantitative** loss across languages



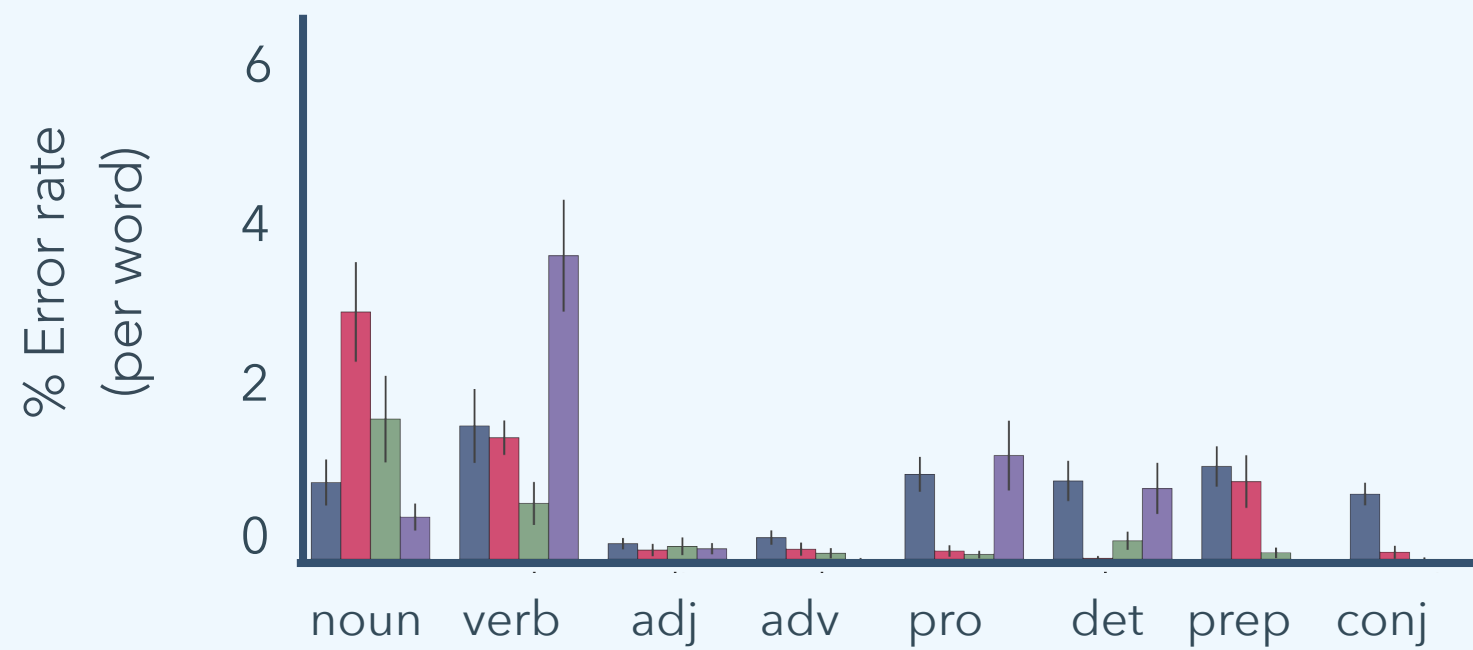
Uneven **quantitative** loss across languages

Dominance predicts error quantity!

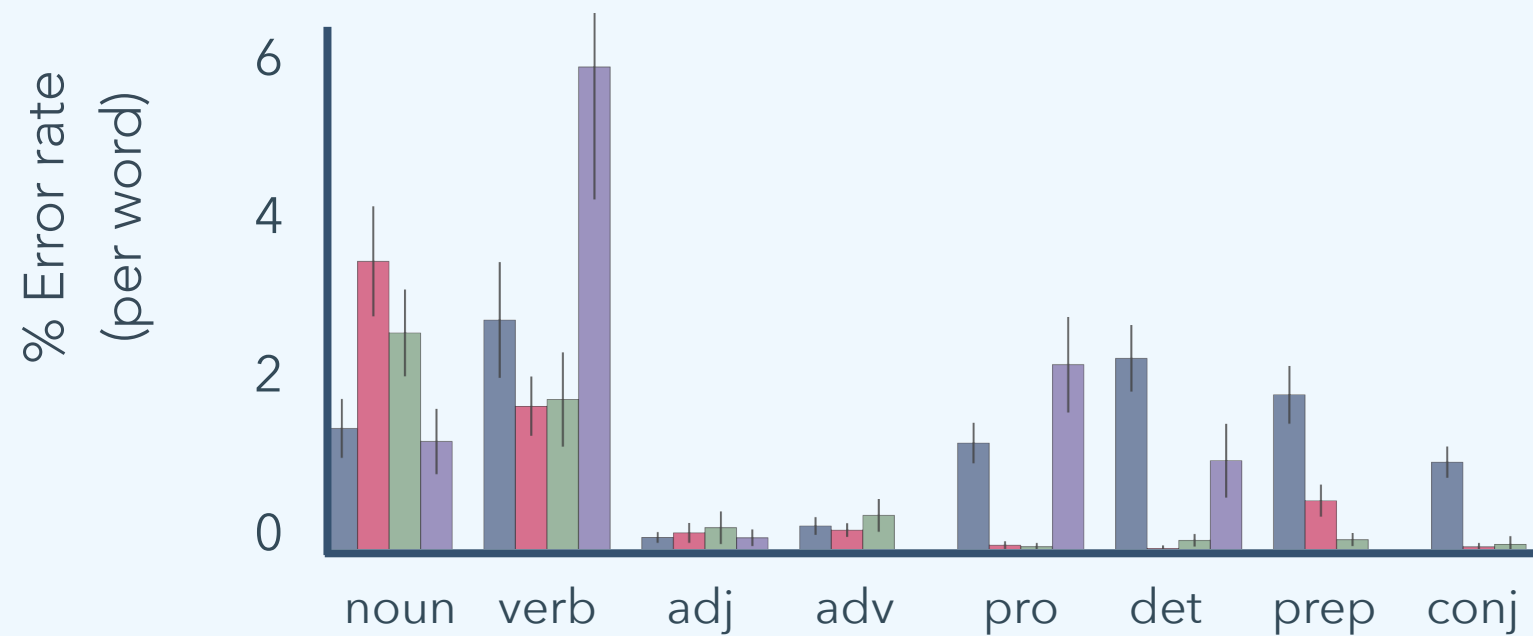




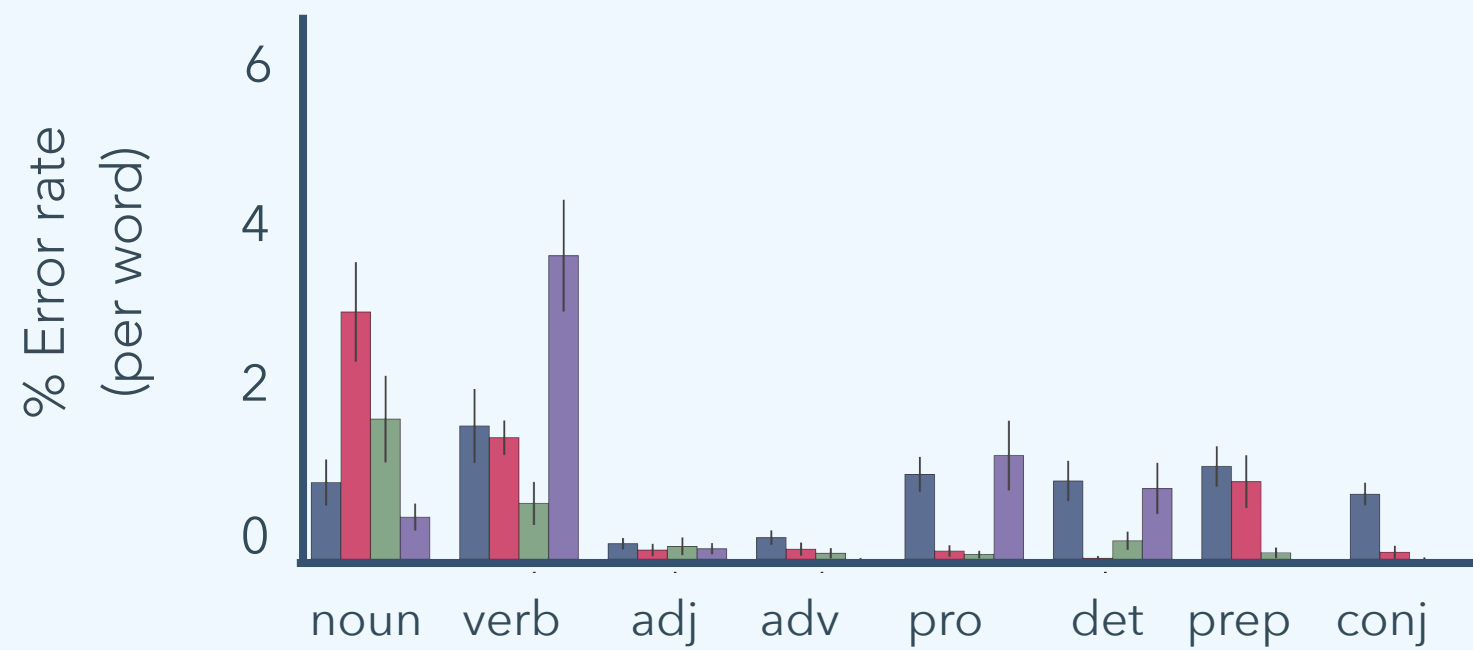
Dominant language



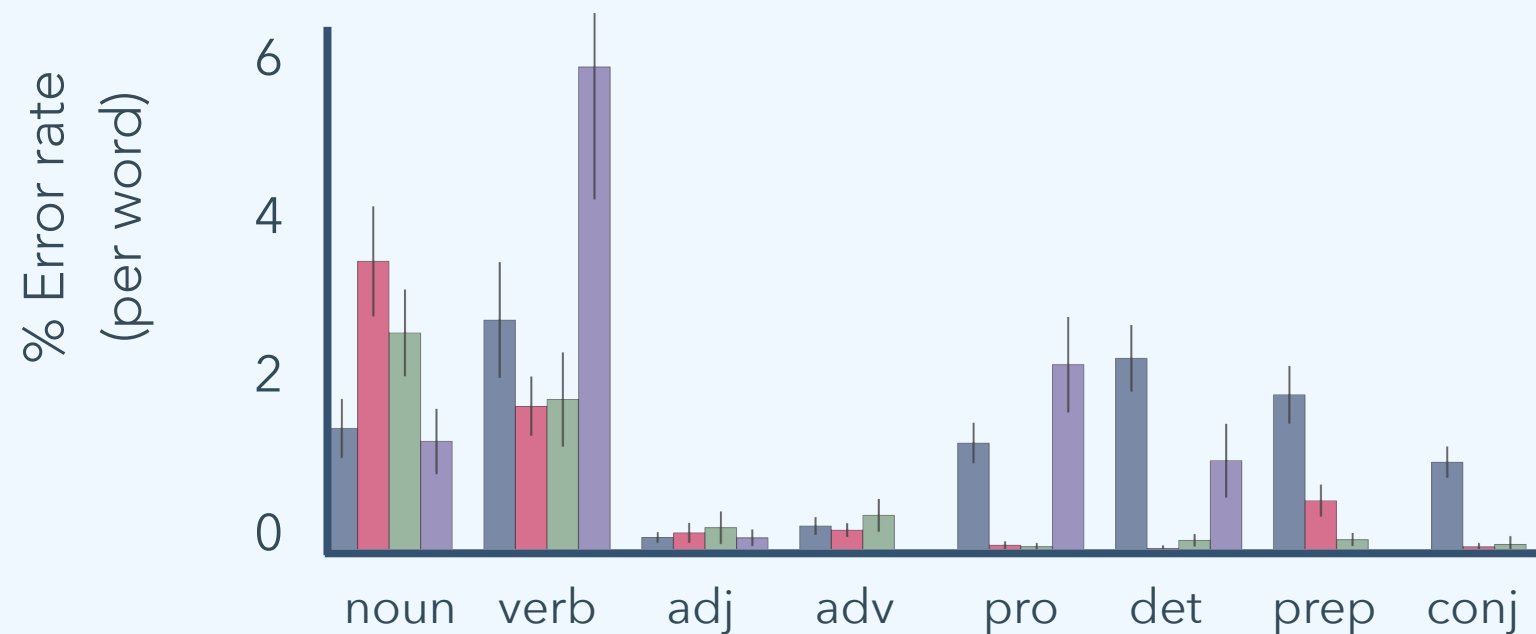
Non dominant language



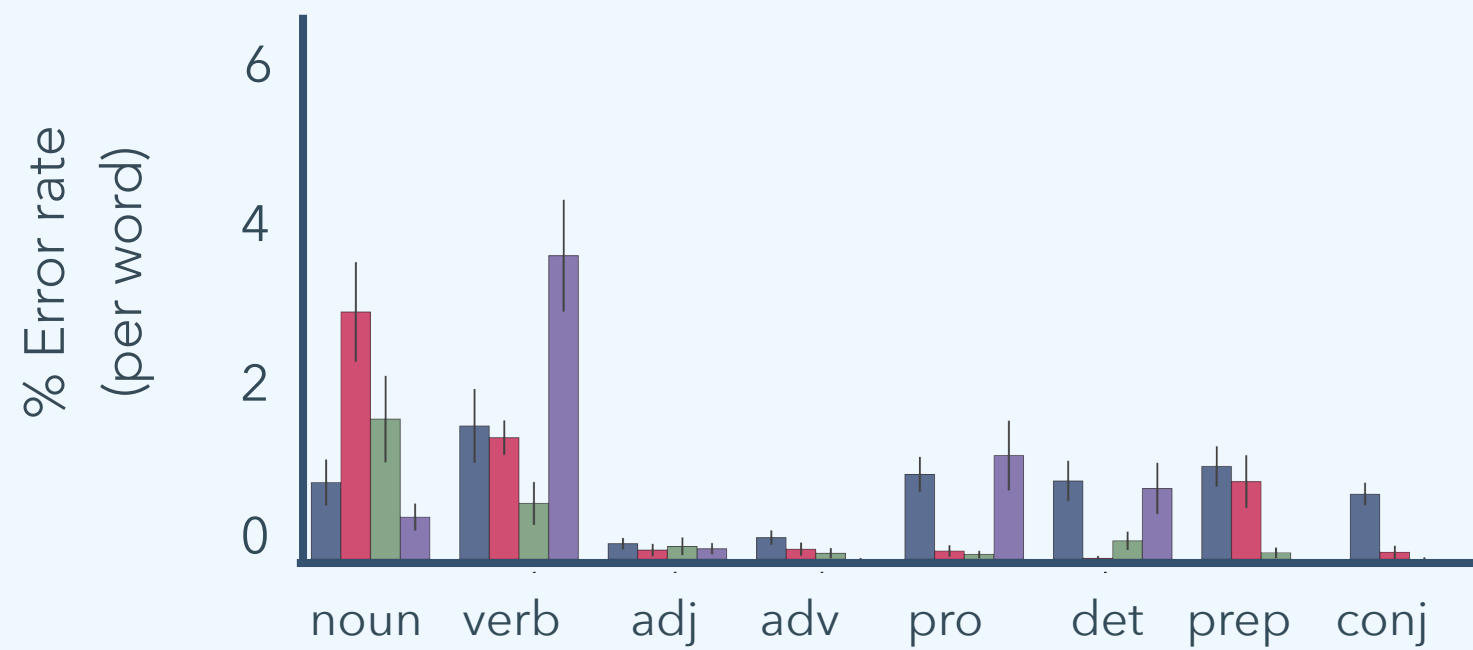
Dominant language



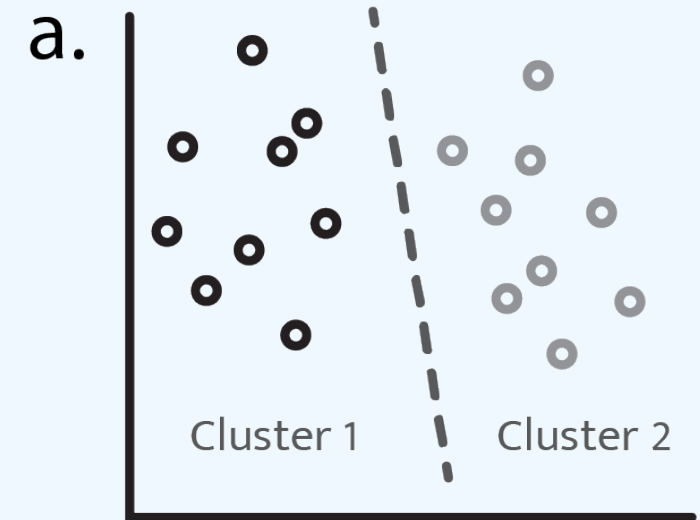
Non dominant language



Dominant language

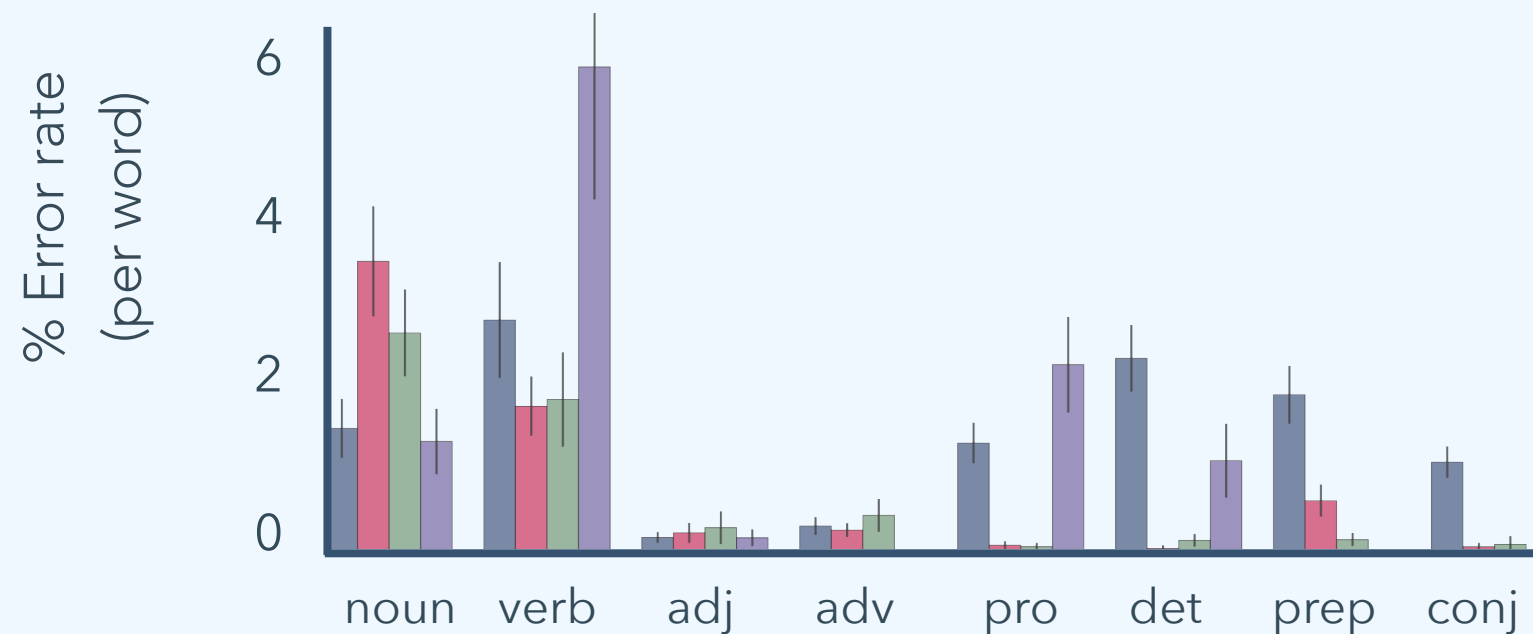


Simulation

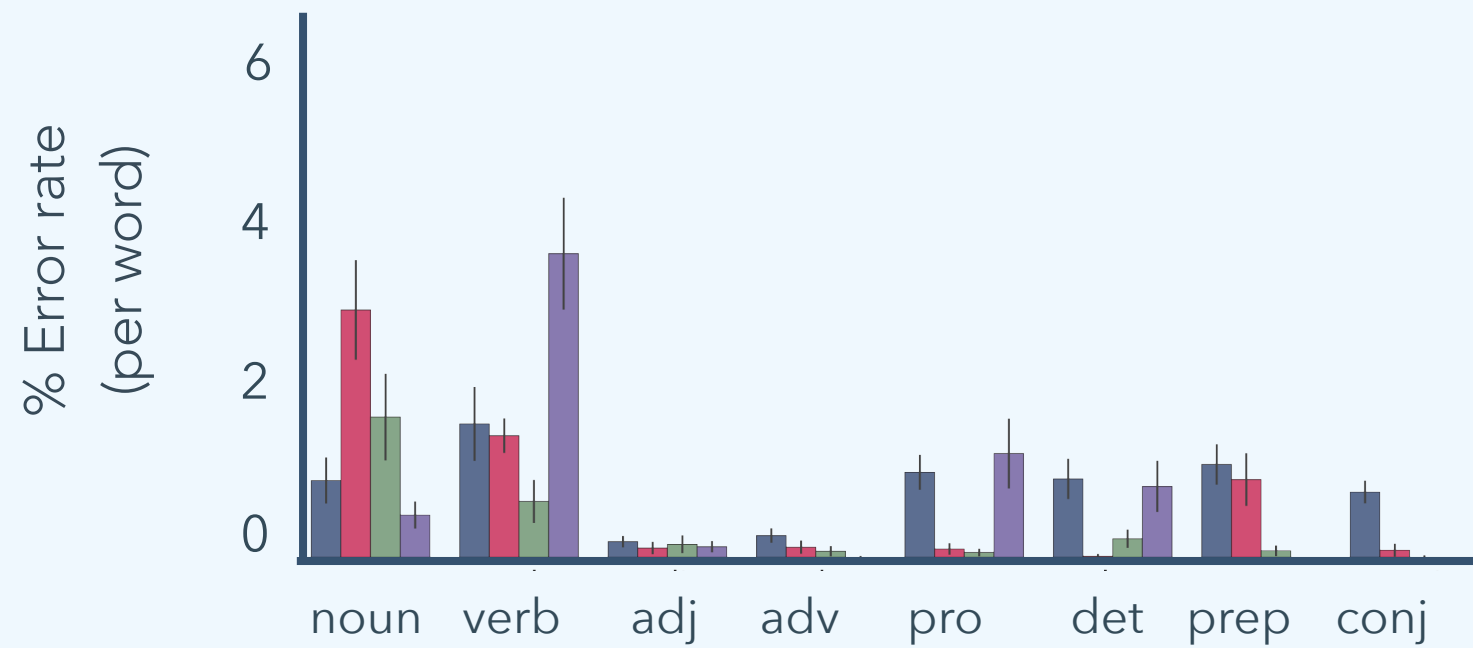


Distinct
distributions

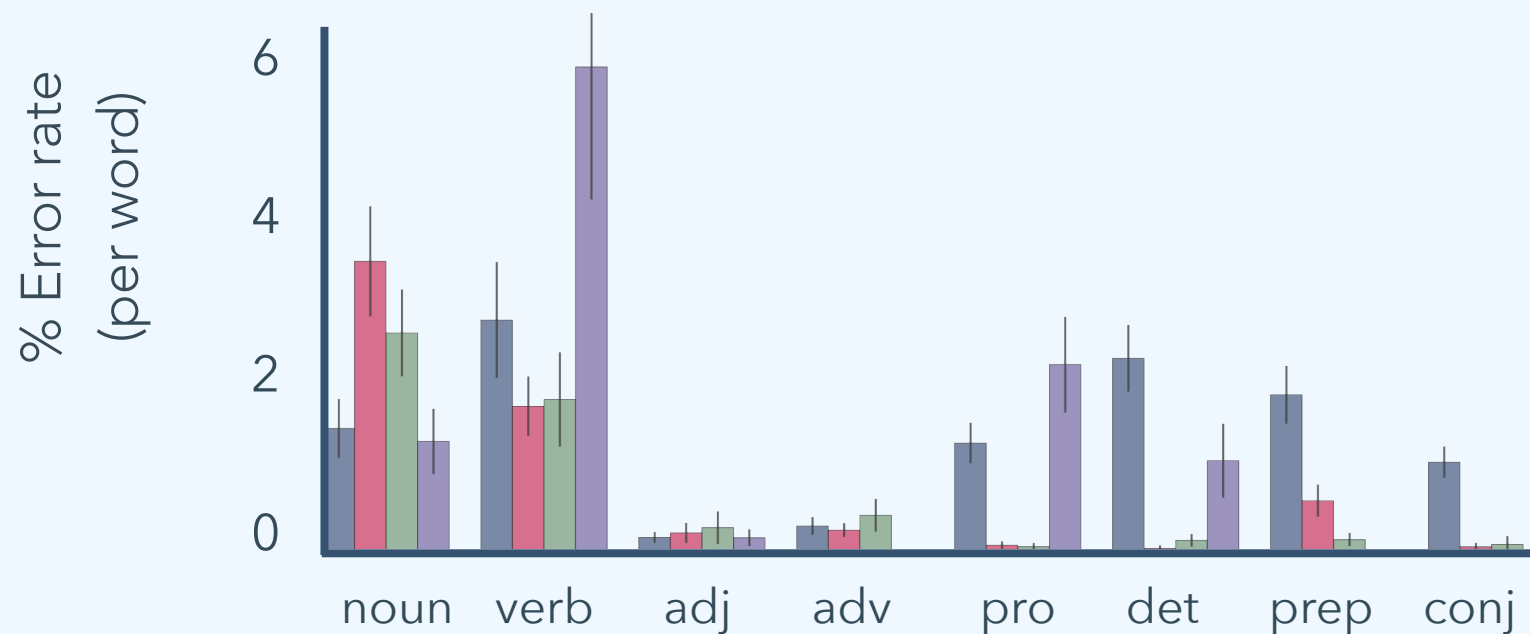
Non dominant language



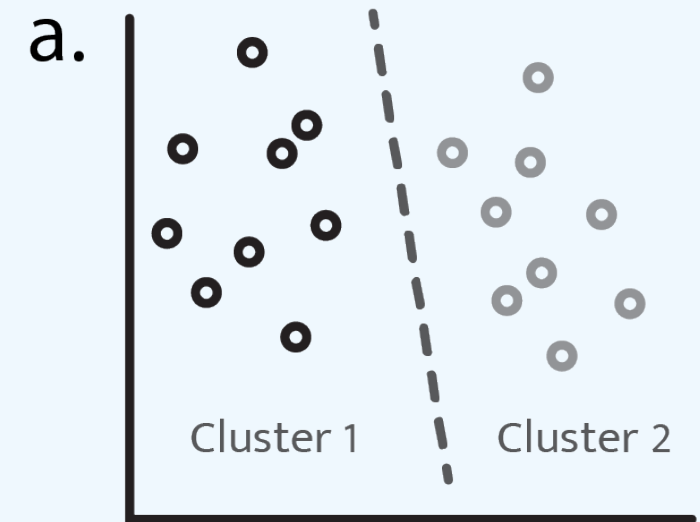
Dominant language



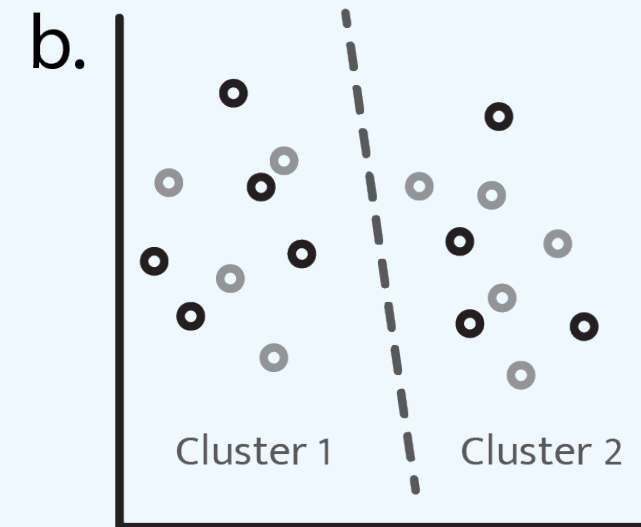
Non dominant language



Simulation

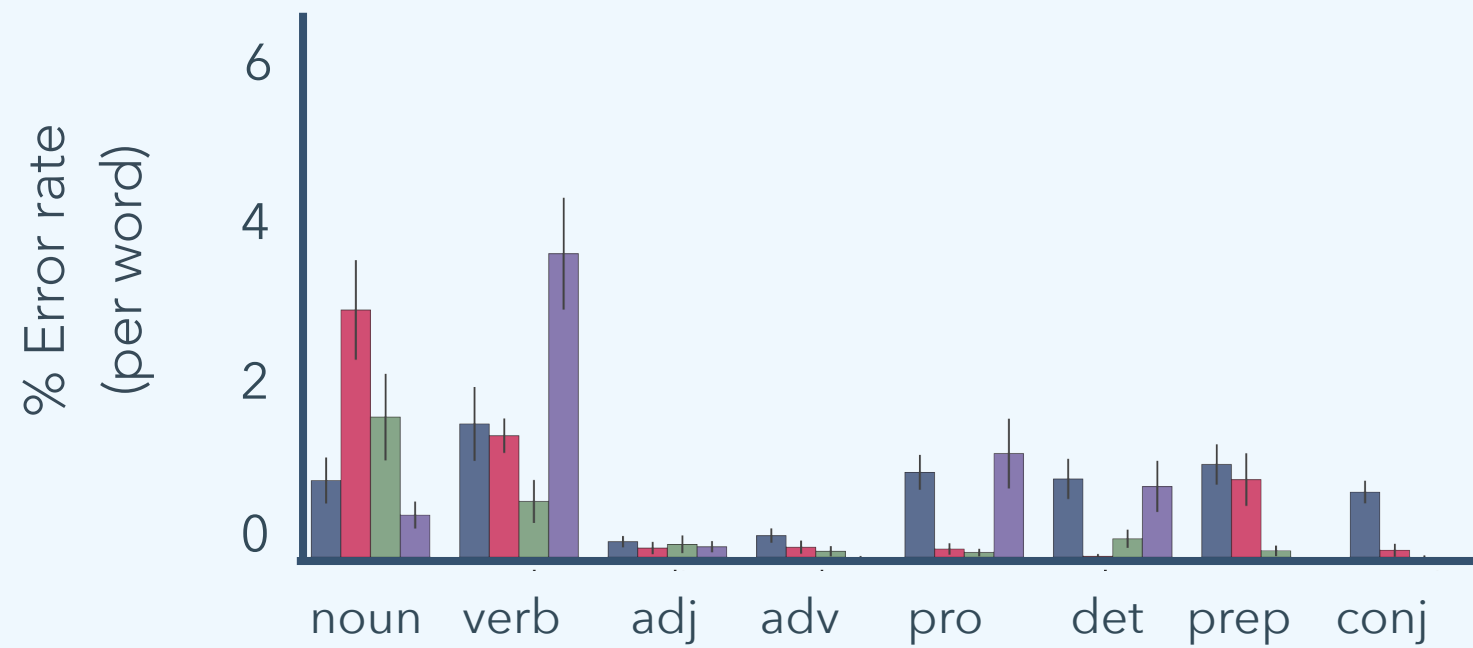


Distinct
distributions

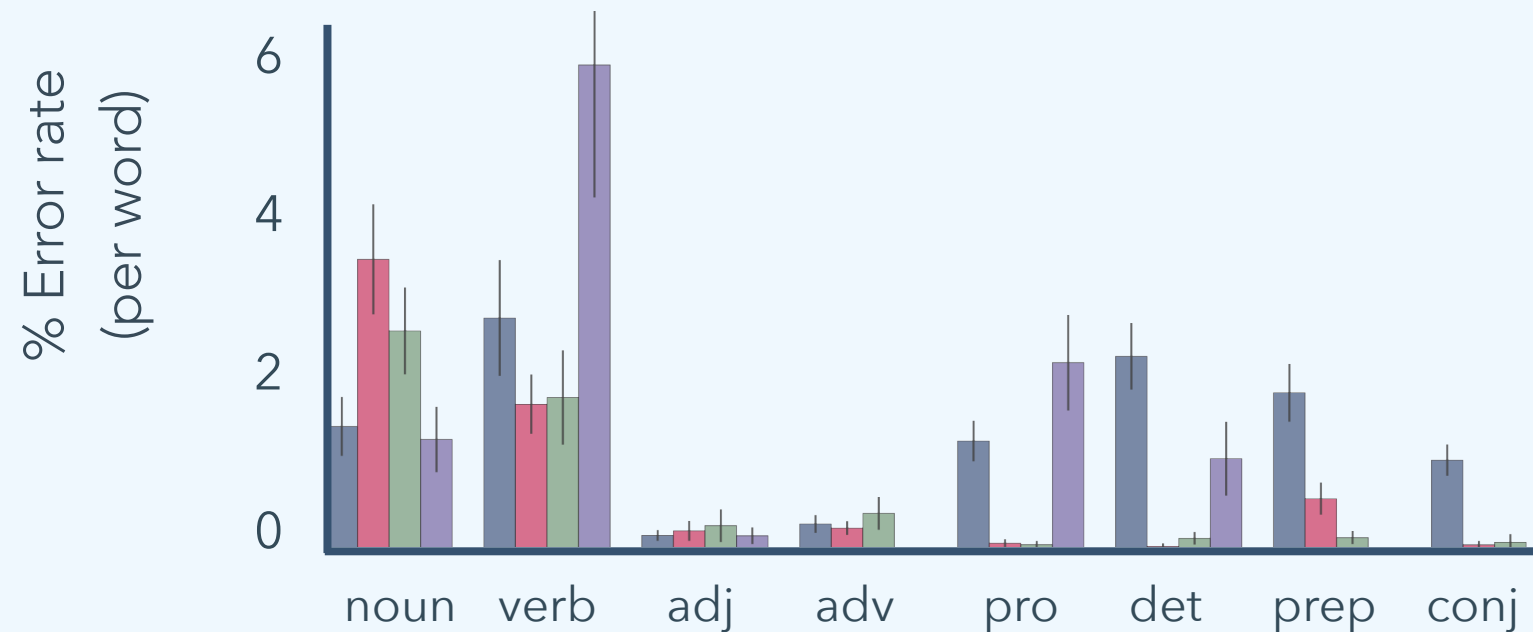


Parallel
distributions

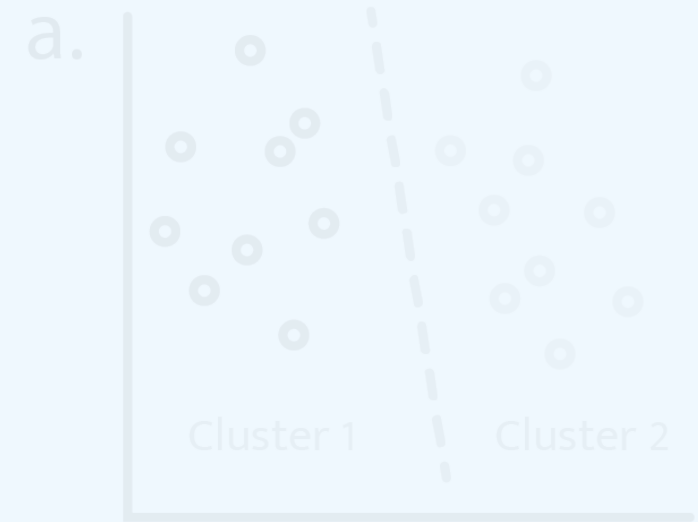
Dominant language



Non dominant language

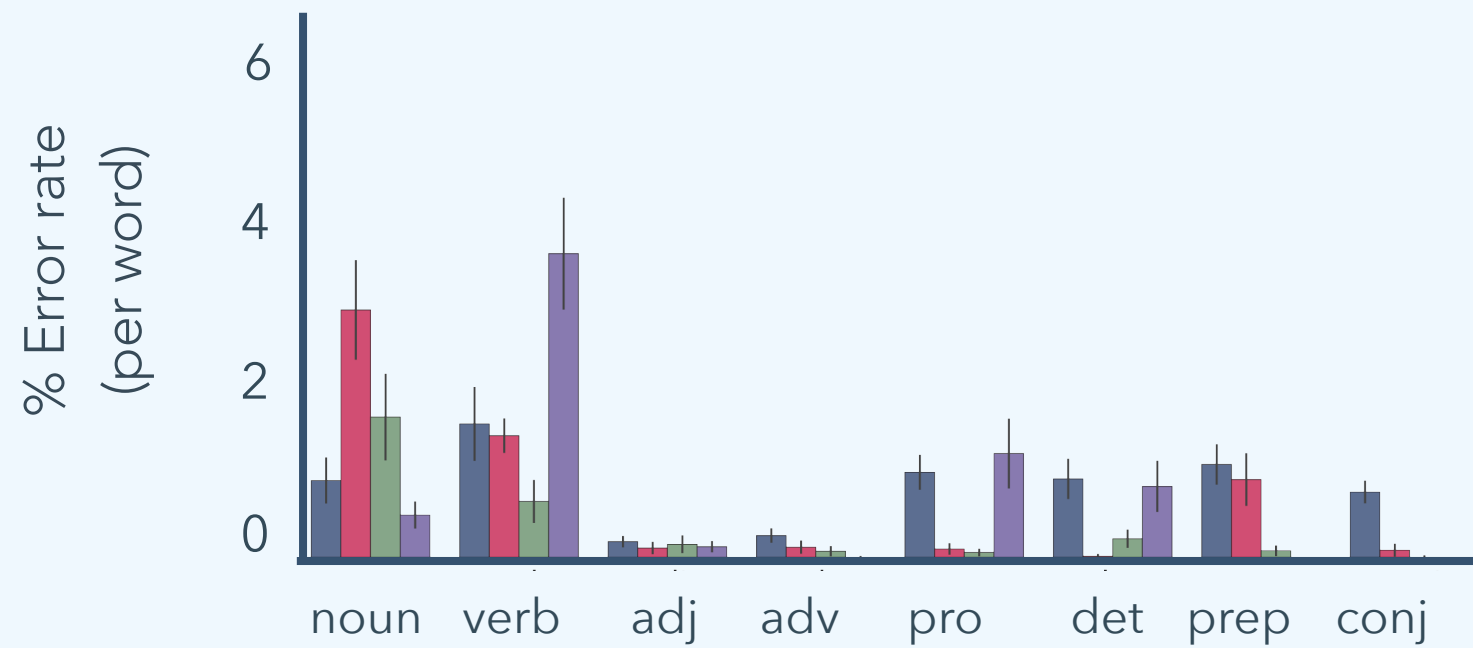


Simulation

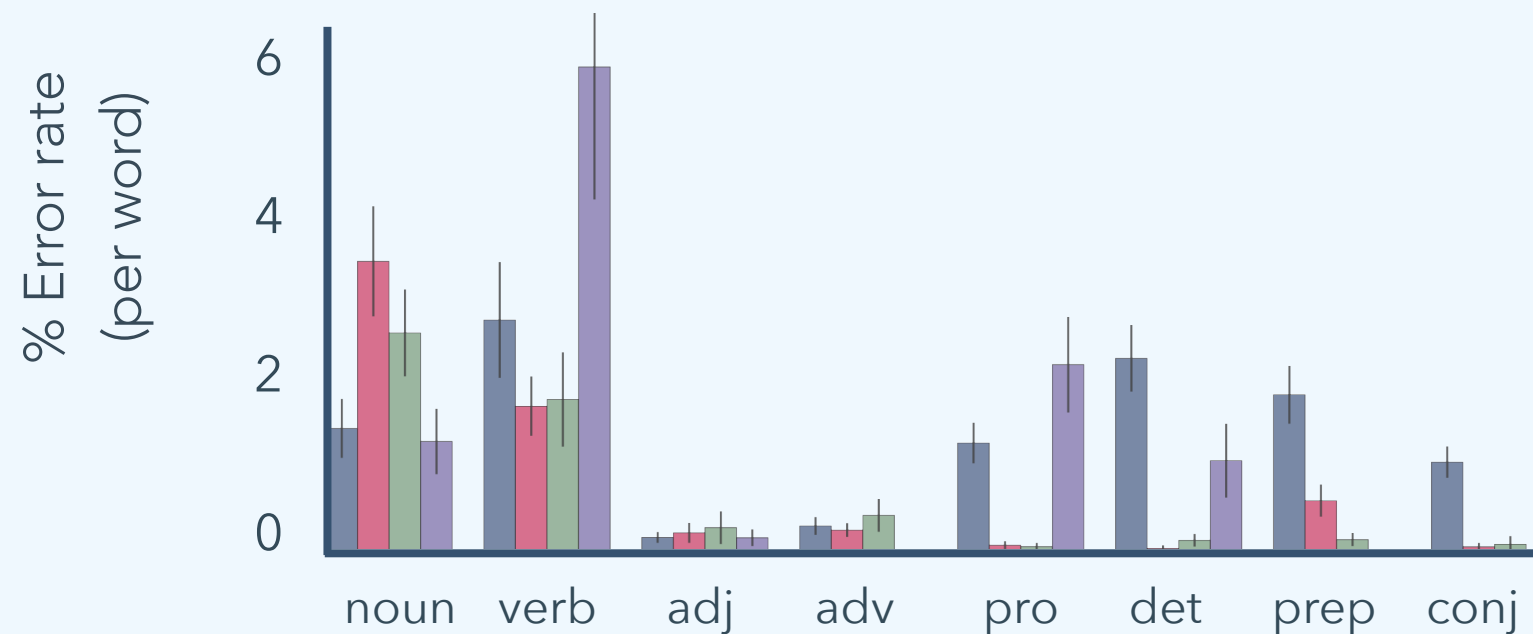


Parallel
distributions

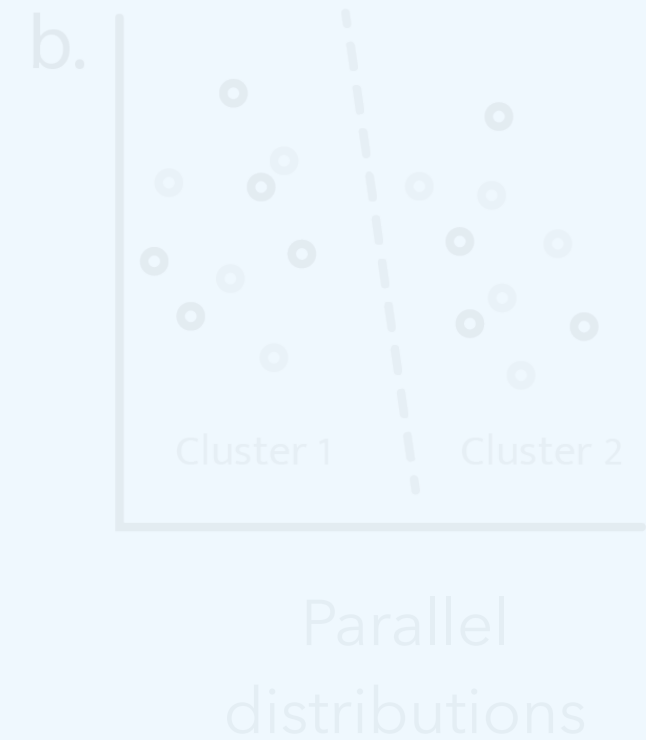
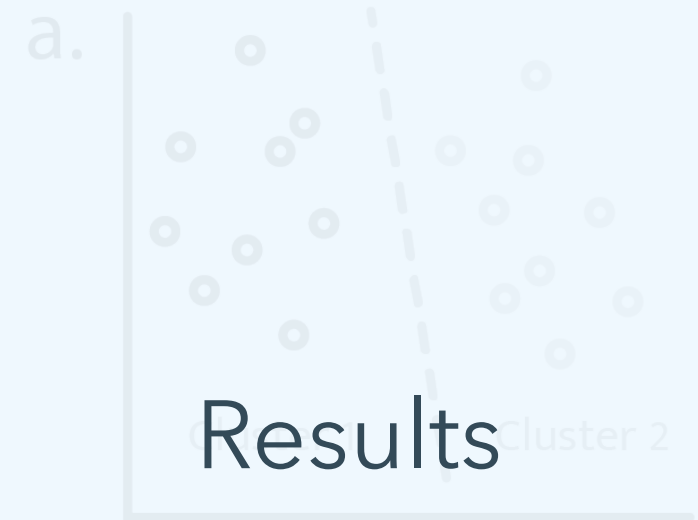
Dominant language



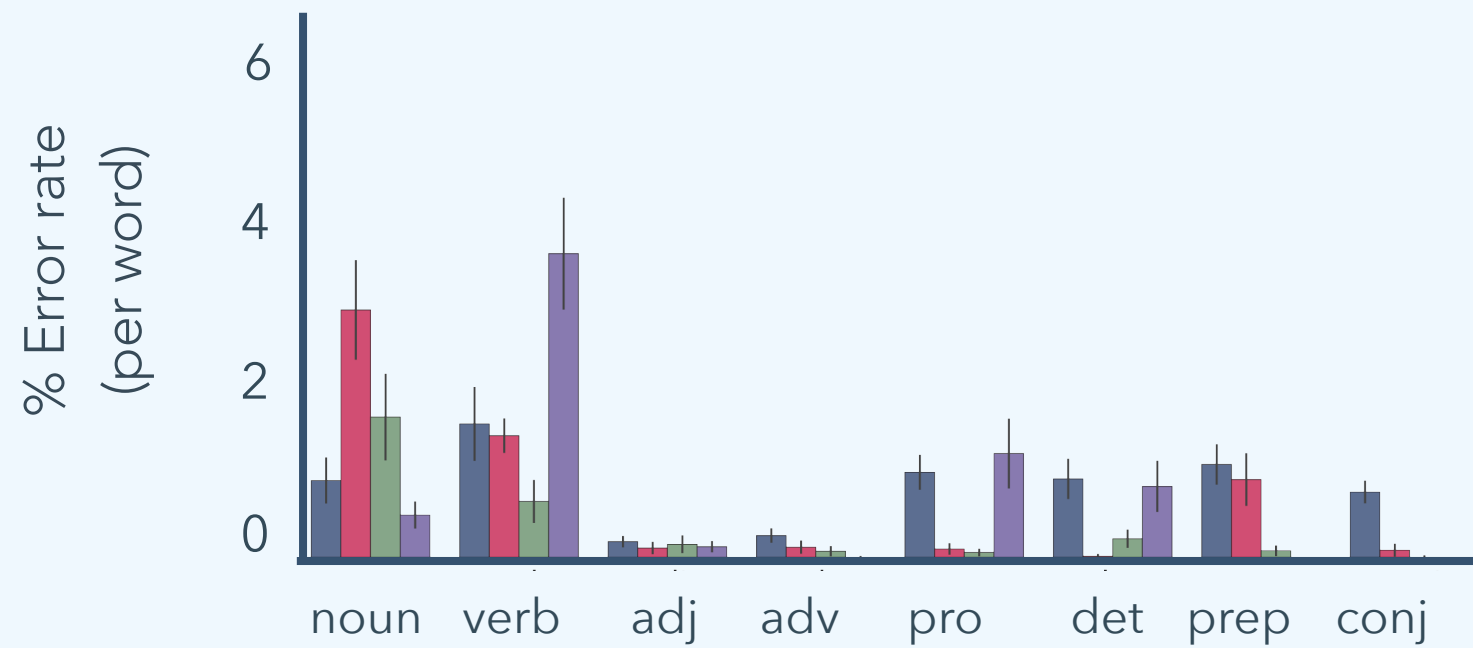
Non dominant language



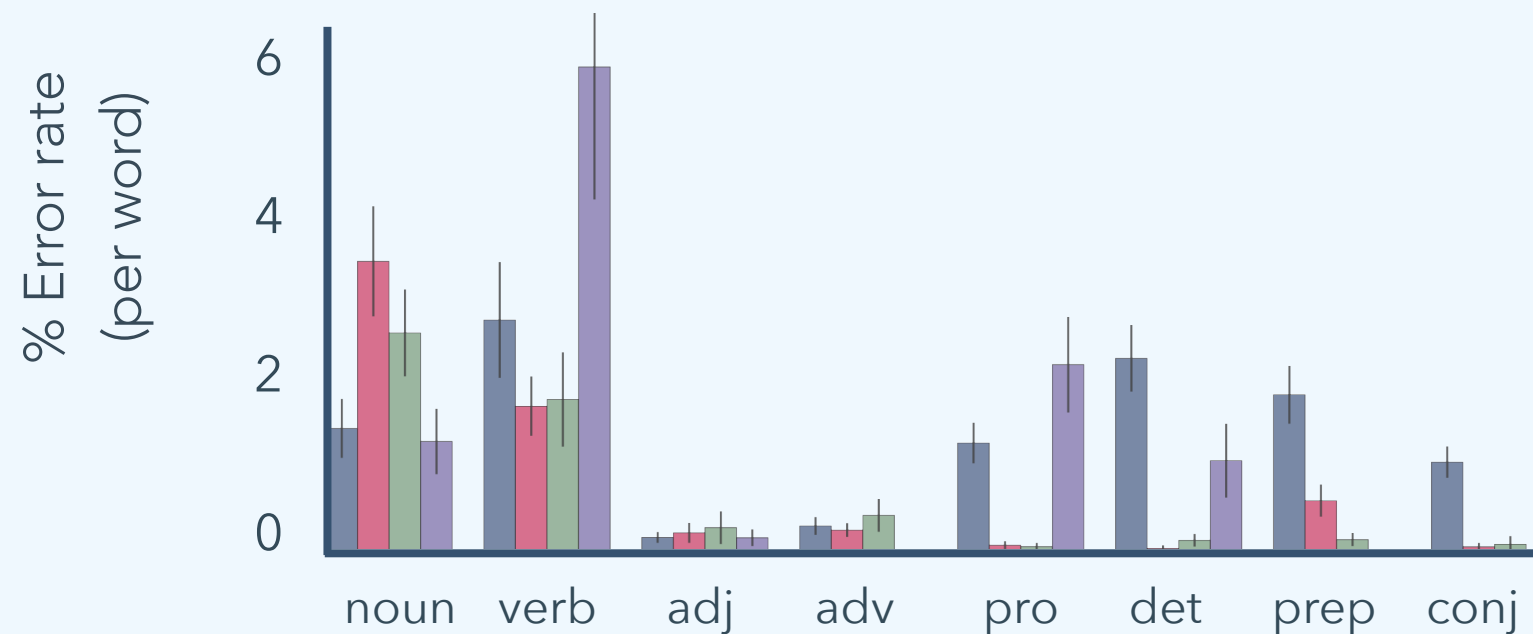
Simulation



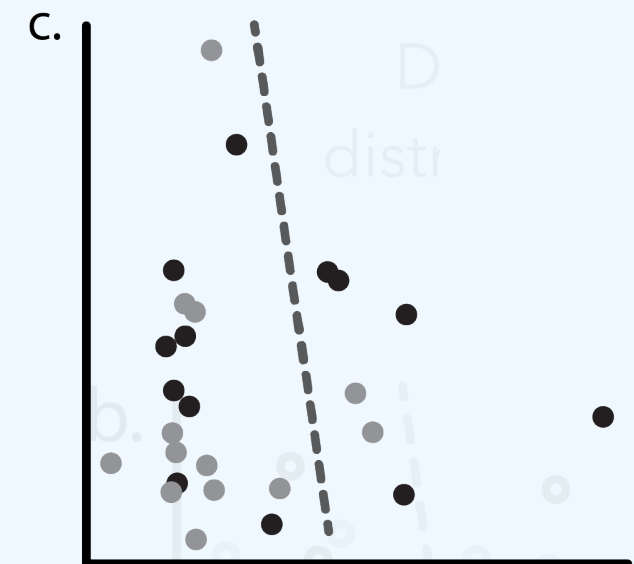
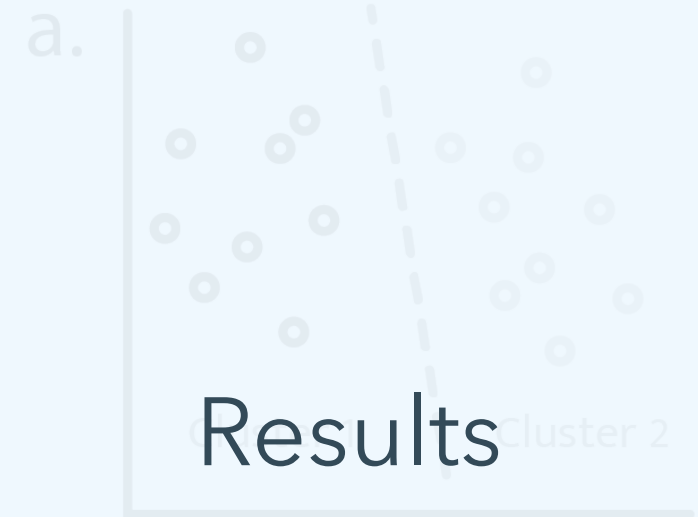
Dominant language



Non dominant language



Simulation



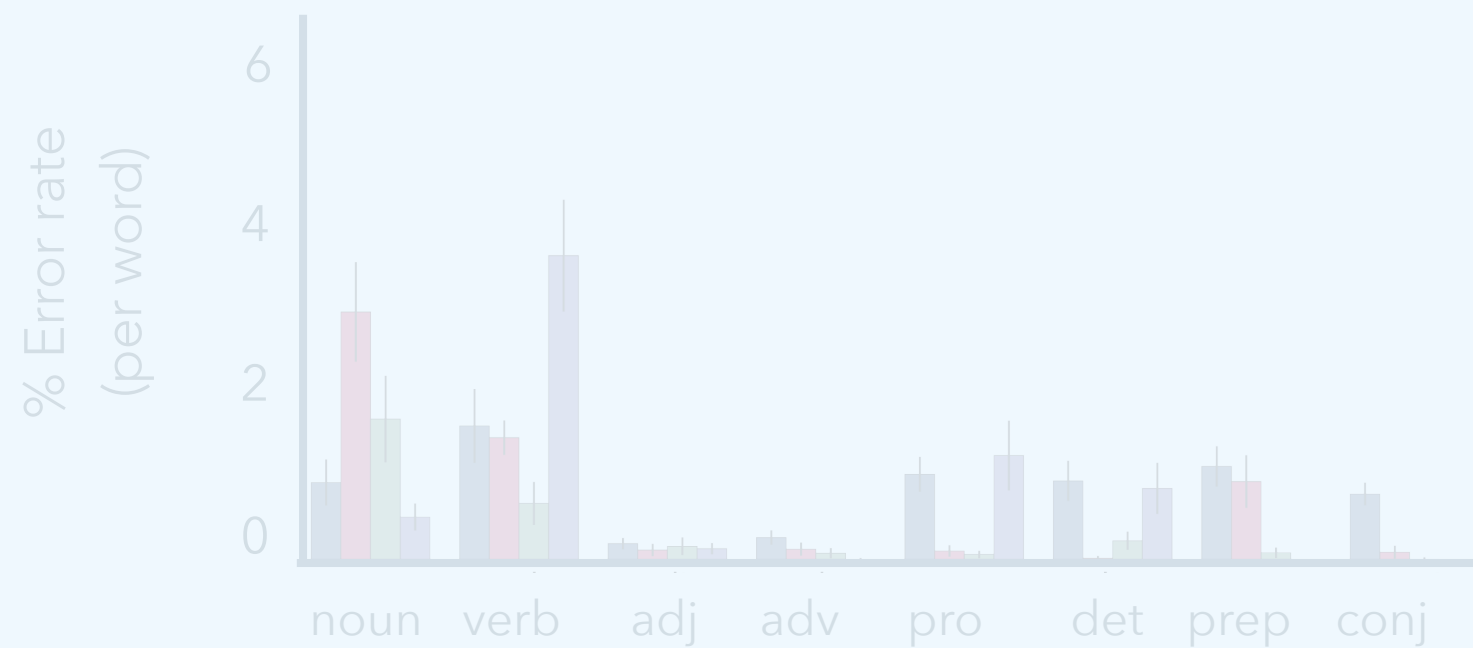
Parallel distributions

Cluster 1

Cluster 2

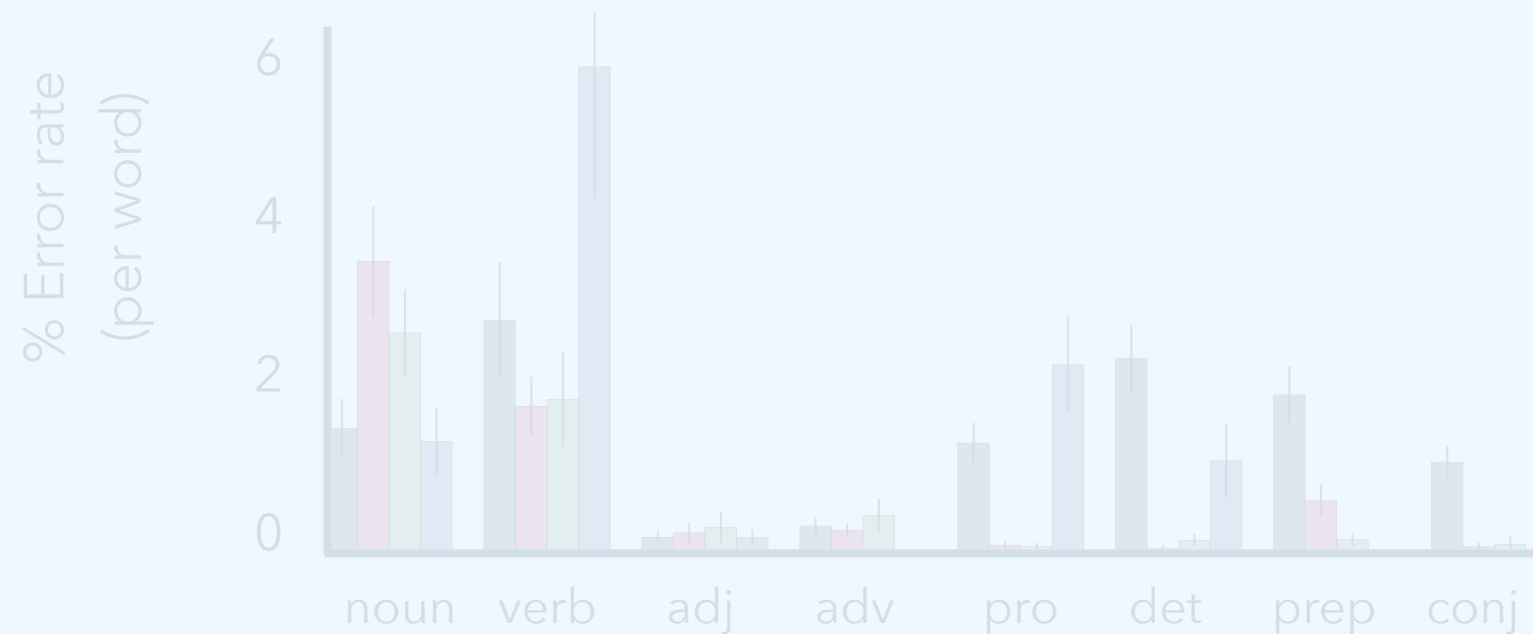
Parallel distributions

Dominant language

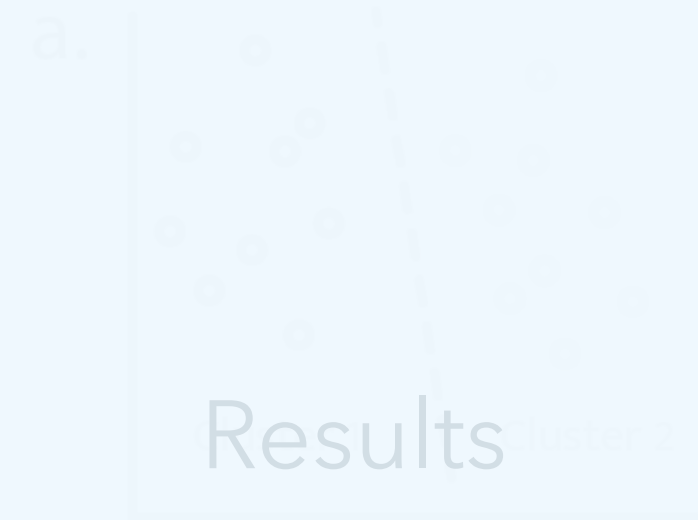


Even **qualitative** loss across languages

Non dominant language



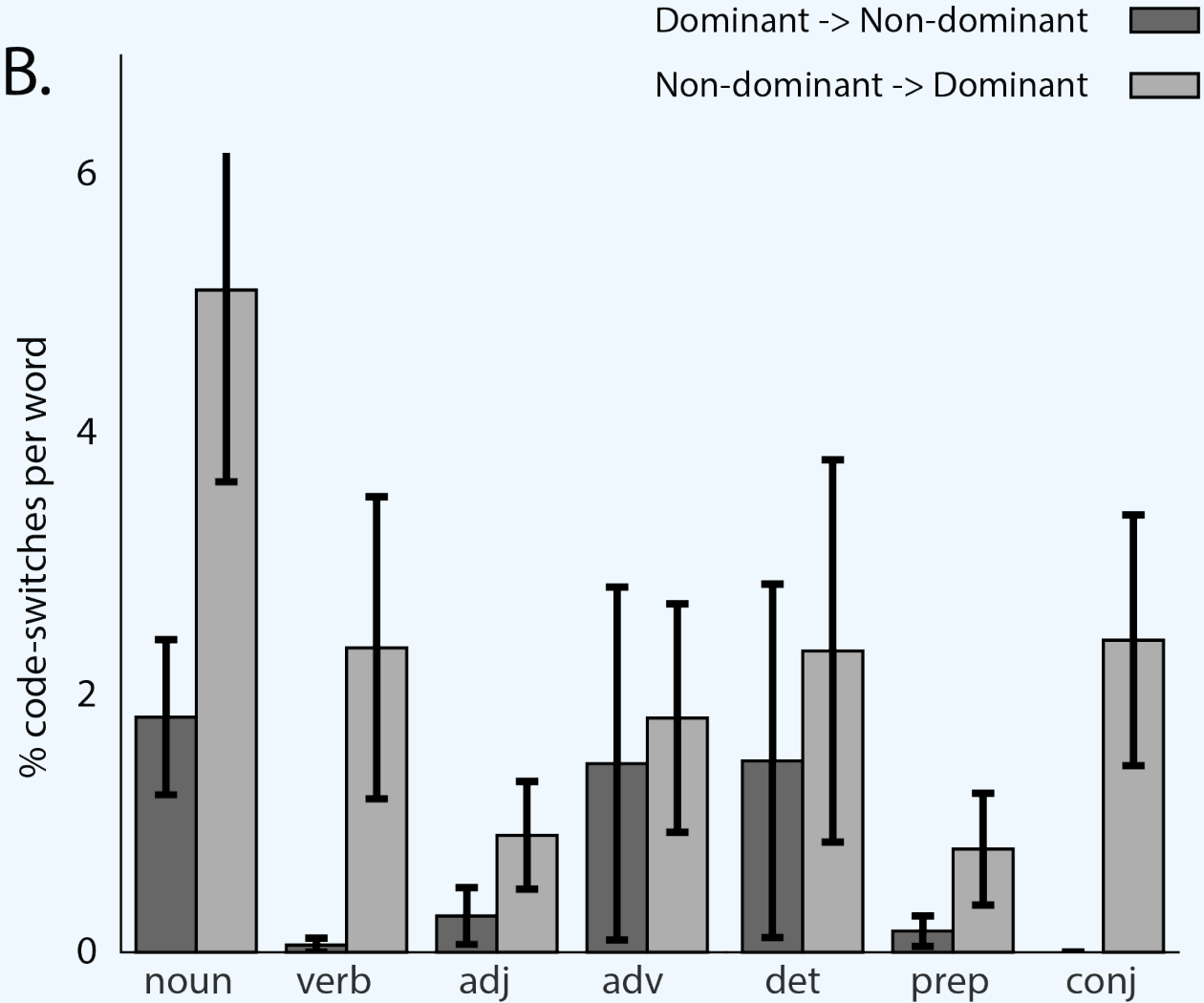
Simulation



Parallel distributions

Code-switching **into** dominant language

Code-switching **into** dominant language



Predictions Unified System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Predictions Separate System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

Qualitatively dissimilar deficits

Quantitatively dissimilar deficits

Code-switching to Non-Dominant Lang.

Predictions Unified System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

- Kualitatiboki* antzeko defizita
- Kuantitatiboki* dominantziaren arabera
- Code-switching hizkuntza nagusira

Predictions Separate System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

- Qualitatively dissimilar deficits
- Quantitatively dissimilar deficits
- Code-switching to Non-Dominant Lang.

Predictions Unified System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Predictions Separate System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

Qualitatively dissimilar deficits

Quantitatively dissimilar deficits

Code-switching to Non-Dominant Lang.

Predictions Unified System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
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x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Predictions Separate System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	40
Phonological	40	10

Qualitatively dissimilar deficits

Quantitatively dissimilar deficits

Code-switching to Non-Dominant Lang.

Predictions Unified System

	Non-Dominant Language	Dominant Language
Syntax	10	20
Semantic	10	20
Morphological	10	20
Phonological	20	40

x2

Kualitatiboki antzeko defizita

Kuantitatiboki dominantziaren arabera

Code-switching hizkuntza nagusira

Predictions Separate System

	Non-Dominant Language	Dominant Language
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Semantic	10	20
Morphological	10	40
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Qualitatively dissimilar deficits

Quantitatively dissimilar deficits

Code-switching to Non-Dominant Lang.

Galderak

