# BATS: BenchmArking Text Simplicity

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#### Introduction

Text simplification is the task of simplifying a given text that is difficult to understand. Domains of the texts and the target group of readers are usually not considered. We provide an explainable method to assess concrete rules from practical and of describing features literature simplicity and complexity of text. Our experiments on 15 datasets for text simplification highlight differences in features that are important in different domains of text and for different intended target audiences.

#### Method

literature

feature

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interpretation

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category

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dataset with

simplicity scores

>★★☆ simplicity

score

1010

1010

vector

text

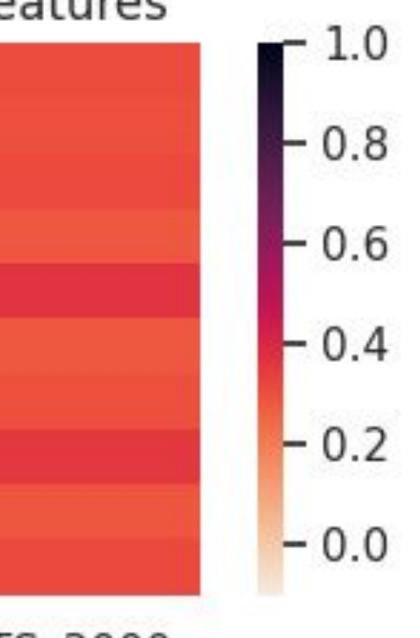
rules from literature We implement RO1via Snorkel to determine if these rules appear in a dataset consisting of texts. The rules express heuristics that linguistic experts consider to be salient characteristics of the measure of text simplicity. After applying these rules, binary vectors are obtained.

These vectors combined with simplicity scores

### Findings

**Correlation with Complex Features** few words per sentence few infrequent words low age of acquisition average lexical richness low Flesch-Kincaid Grade Level Index high Flesch reading ease high imageability short sentences few modifiers few noun phrases

> ARTS 3000 ARTS 300 Correlation with Simple Features



Research Questions

**characteristics** Which from literature reflect the simplicity or complexity of texts?

of texts can then be used to prune the rules to only keep those highly indicative of simplicity and complexity (**BATS**). We can construct **BATS** vectors for any text with these pruned rules. These vectors indicate which characteristics of words containing more than simplicity or complexity are satisfied.

text

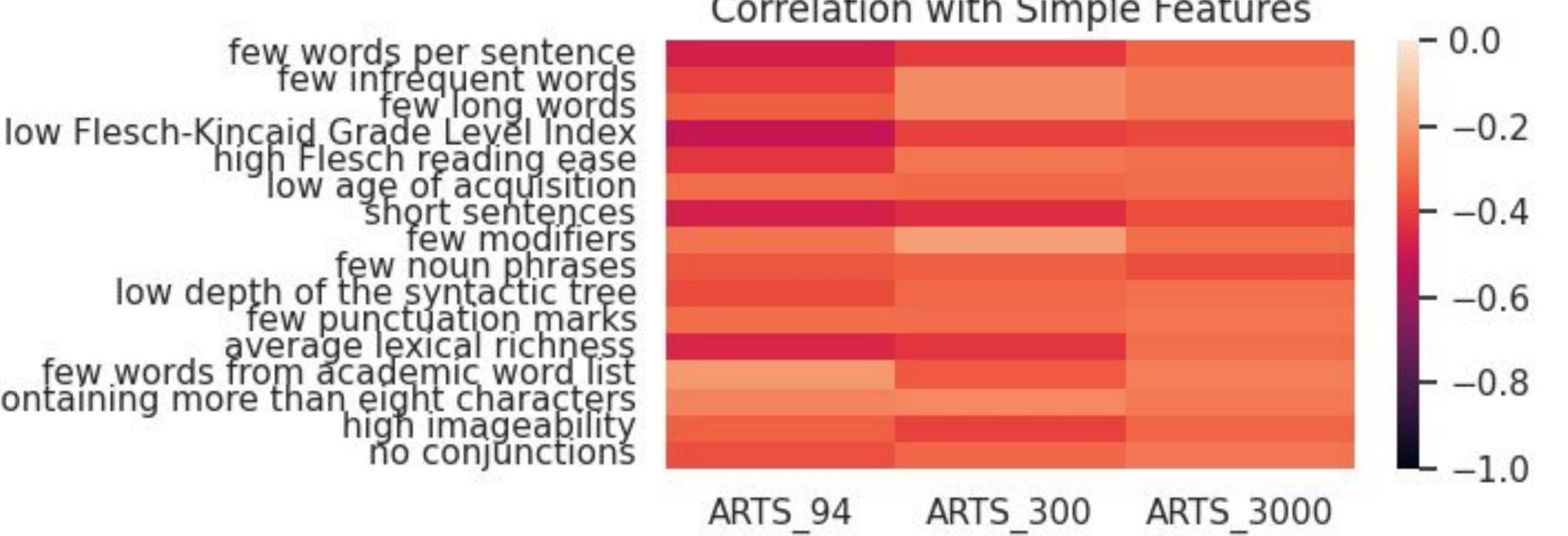
• • •

pruning

BATS model

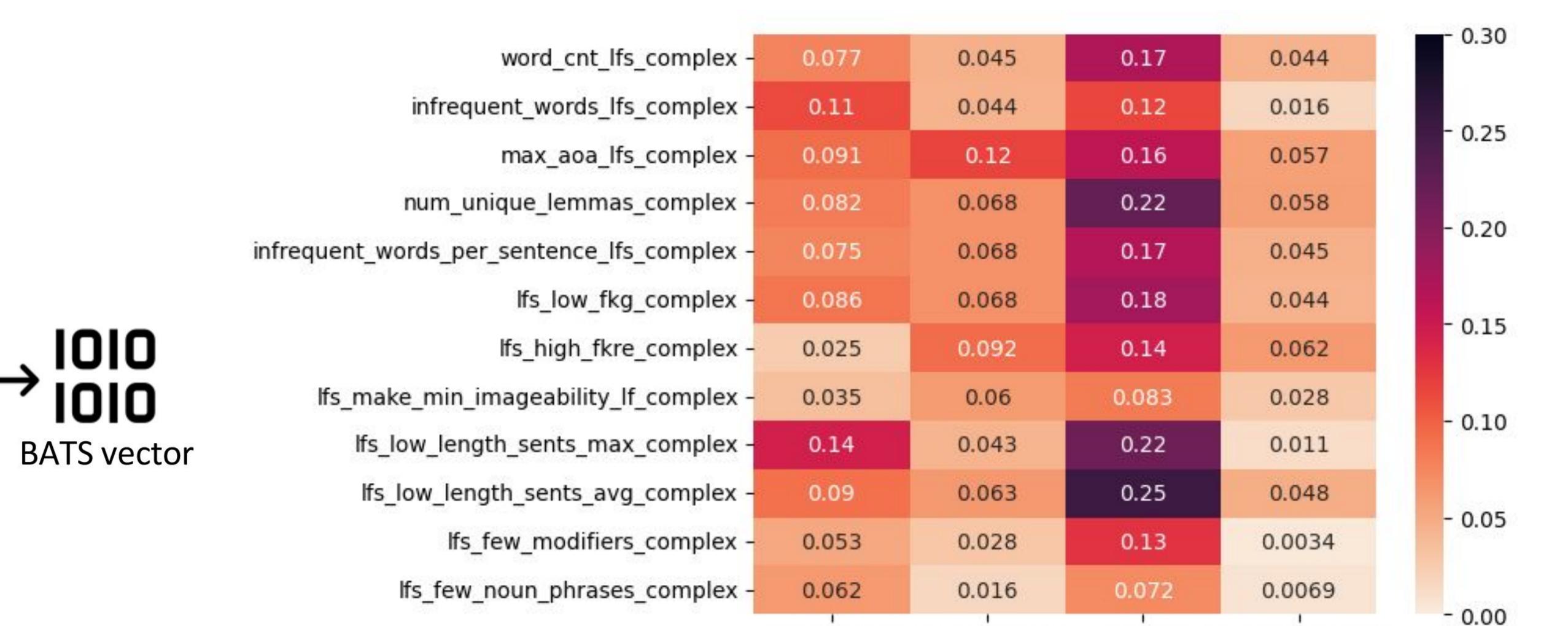
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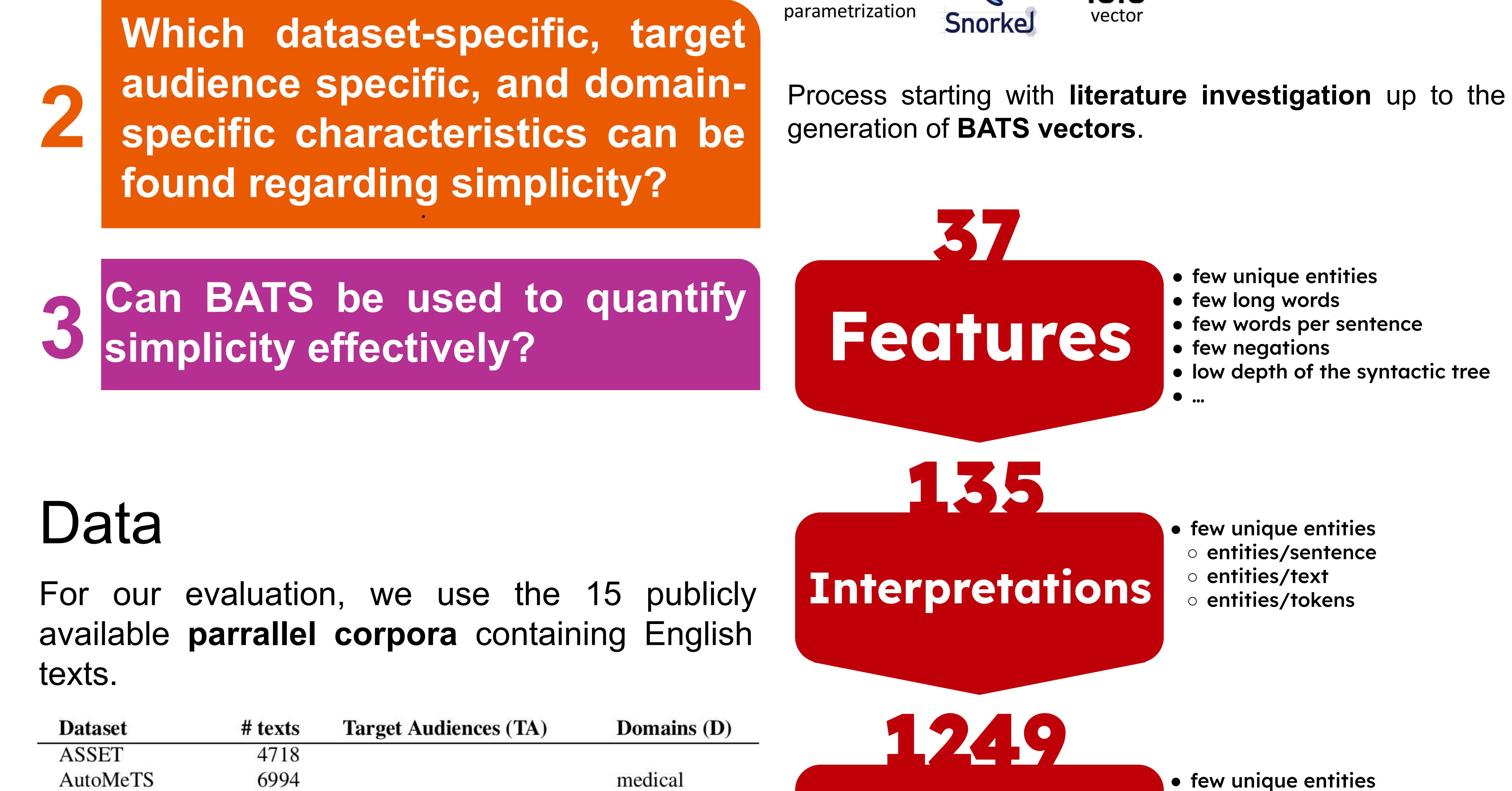
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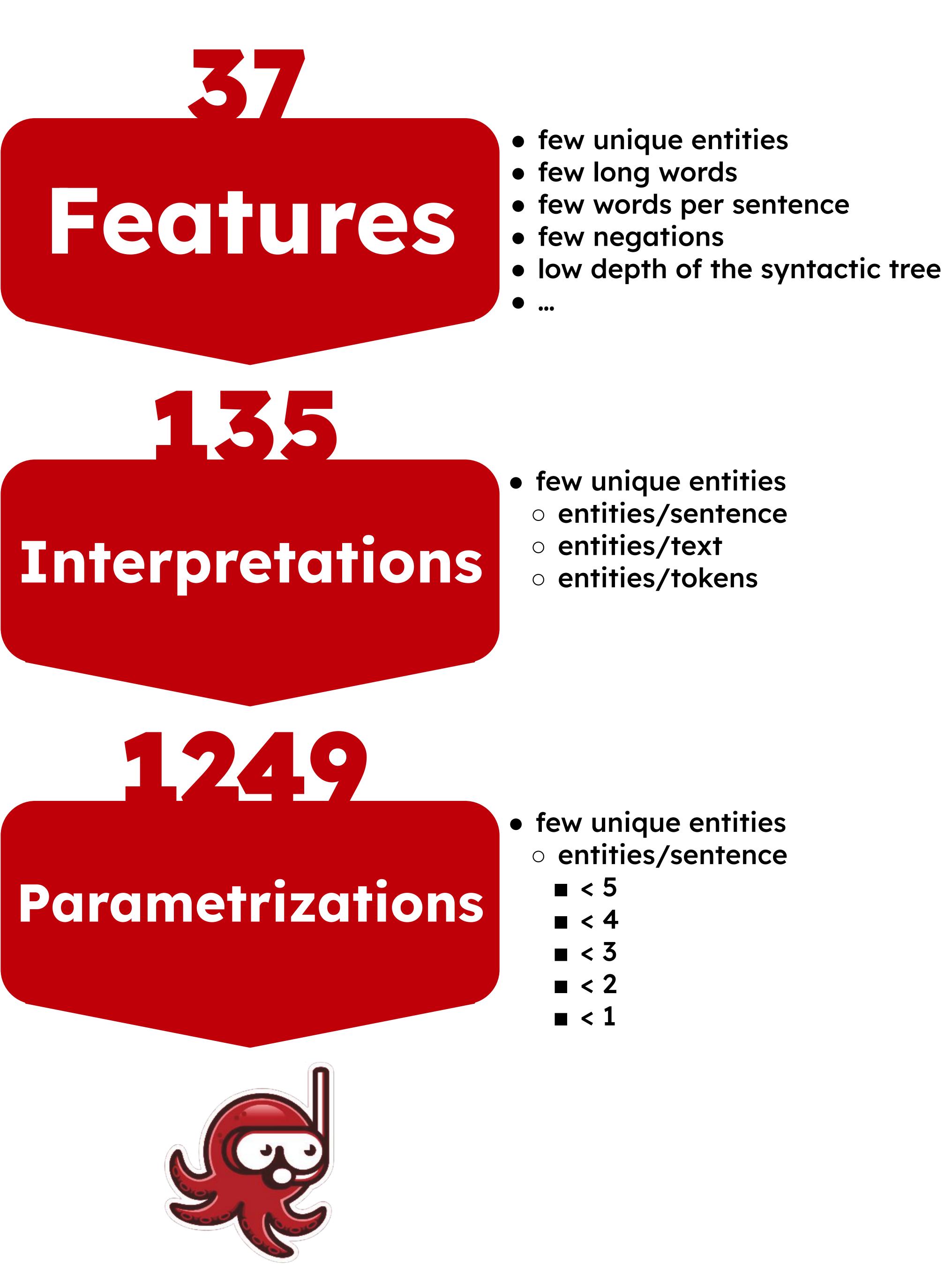


Average correlation of features in BATS vectors with ARTS simplicity scores. The more the correlation deviates from 0, the more intense the color.

RQ2







TA children TA language D\_encyclopedia D news

Average difference between source and simplified texts in parametrizations from different interpretations of target audiences and domains.

RQ3

		MSE (lower values are better)				
		RF		GB		
Train	Predict	BATS	OAI	BATS	OAI	FRE
ARTS <sub>94</sub>	ARTS <sub>300</sub>	.068	.073	.08	.078	.078
ARTS <sub>94</sub>	<b>ARTS</b> <sub>3000</sub>	.059	.076	.067	.081	.086
$ARTS_{300}$	ARTS <sub>94</sub>	.052	.068	.059	.061	.065
$ARTS_{300}$	<b>ARTS</b> <sub>3000</sub>	.055	.07	.06	.07	.086
<b>ARTS</b> <sub>3000</sub>	ARTS <sub>94</sub>	.044	.06	.039	.055	.065
<b>ARTS</b> <sub>3000</sub>	ARTS <sub>300</sub>	.048	.057	.047	.052	.078

**Regression** (Random Forest (RF) and Gradient Boosting (GB)) performance using BATS vectors or OpenAl embeddings (OAI) and ARTS simplicity scores. We report FRE as a baseline.

#### Conclusion

We presented BATS, a explainable method to

<b>EW-SEW-Turk</b>	1000
HutSSF	652
METAeval	604
MTurkSF	126
NNSeval	478
OneStopEnglish	4144
QuestEval	282
SemEval_2007	598
SimPA	2204
SimpEval	324
TurkCorpus	4718

1856

926

children

BenchLS

Britannica

	encyclopedia
	news
	encyclopedia
non-experts	medical
language learners	encyclopedia
language learners	news
	encyclopedia
language learners	administrative
	encyclopedia
children, language learners	encyclopedia

encyclopedia

evaluate straightforward and concrete rules that can be used in quantifying the simplicity or complexity of text. Through our evaluations possibility the for showed nuanced We evaluation of text simplification for different target audiences.





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