Does It Capture STEL?

A Modular, Similarity-based Linguistic Style Evaluation Framework

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NLP and Society Lab

Style in Natural Language Processing

Style is an integral
part of language:

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- influences perception

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- Style Classification
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  ↯ task-specific

Style Measurement Evaluation

Difficulties:

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Our Proposal:

⇒ STyle EvaLuation Framework (STEL)

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- content-controlled
- similarity-based
- modular

⇒ STyle EvaLuation Framework (STEL)

STEL Task

	1	2	
Anchor (A)	r u a fan of them or something?	Are you one of their fans?	Do S and A "match"?
Sentence (S)	Oh, and also that young physician got an unflattering haircut	Oh yea and that young dr got a bad haircut	

STEL Task

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Anchor (A)	r u a fan of them or something?	Are you one of their fans?
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Anchor (A)	r u a fan of them or something?	Are you one of their fans?	paraphrase
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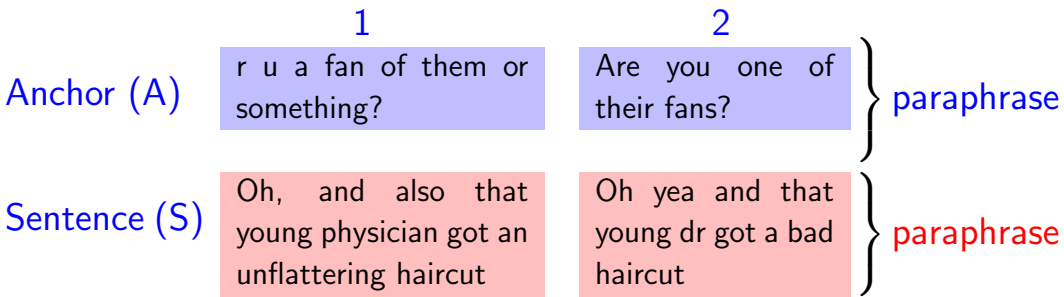
STEL Task is content-controlled



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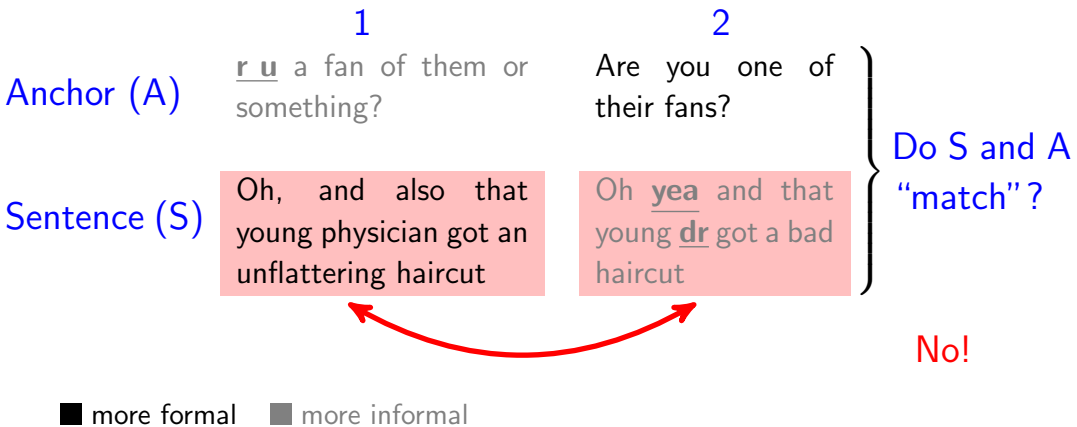
■ more formal ■ more informal

STEL Task


1
2
Anchor (A)
r u a fan of them or something?
Are you one of their fans?
Sentence (S)
Oh, and also that young physician got an unflattering haircut
Oh yea and that young dr got a bad haircut
Do S and A "match"?
No!
more formal
more informal

STEL Task Generation*

*Examples shortened

formal	informal
Are you one of their fans?	**r u** a fan of them or something?
Oh, and also that young physician got an unflattering haircut	Oh **yea** and that young **dr** got a bad haircut

- **formal/informal**

Yahoo! Answers paraphrases from [Rao and Tetreault, Dear Sir or Madam, May I Introduce the GYAFC Dataset: Corpus, Benchmarks and Metrics for Formality Style Transfer, 2018]

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formal	informal
Are you one of their fans?	**r u** a fan of them or something?
Oh, and also that young physician got an unflattering haircut	Oh **yea** and that young **dr** got a bad haircut

r u a fan of them or something?

Oh, and also that young physician got an unflattering haircut

Are you one of their fans?

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STEL Task Generation*

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simple	complex
These rock formations are made of sandstone.	These rock formations are **composed** of sandstone.
The Odyssey is an old poem written by Homer.	The Odyssey is an **ancient** poem **attributed** to Homer.

These rock formations are **composed** of sandstone.

These rock formations are made of sandstone.

The Odyssey is an **ancient** poem attributed to Homer.

The Odyssey is an old poem written by Homer.

- formal/informal

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STEL Task Generation*

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no nb3r	nb3r
<3 friends forever	<3 friends **4**ever
Dude 30$ is heaps cheap	**D00d** 30$ is heaps cheap

<3 friends forever

<3 friends **4**ever

D00d 30$ is heaps cheap

Dude 30$ is heaps cheap

- formal/informal

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- **(no) numb3r substitution**

  based on **Reddit** utterances

- complex/simple

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STEL Task Generation*

*Examples shortened

no con'raction	con'raction
It has become one of the world's most significant cities.	**It's** become one of the world's most significant cities.
Will does not refer to any particular desire.	Will **doesn't** refer to any particular desire.

It has become one of the world's most significant cities.

It's become one of the world's most significant cities.

Will does not refer to any particular desire.

Will **doesn't** refer to any particular desire.

- formal/informal

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*Examples shortened

Style 1	Style 2
Anchor Sentence 1	Anchor Sentence 2
Alternative Sentence 2	Alternative Sentence 1

Paraphrases

Anchor Sentence 1 Anchor Sentence 2

Alternative Sentence 1 Alternative Sentence 2 ✓

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Model Evaluation

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Anchor (A)	r u a fan of them or something?	Are you one of their fans?
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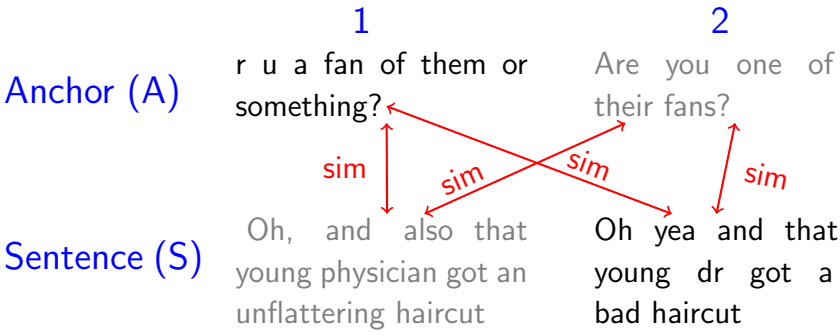
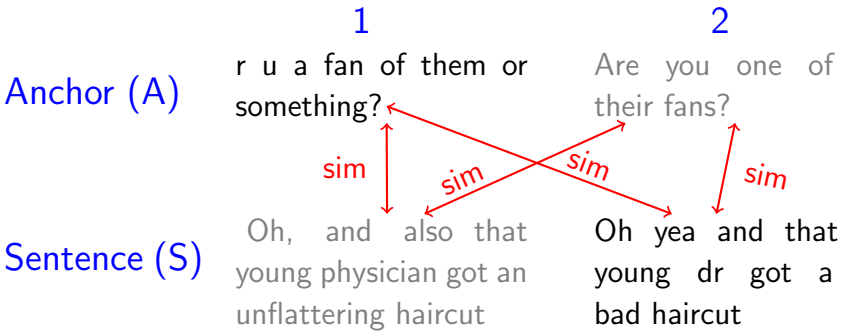
How should models decide?

Model Evaluation



How should models decide?

Model Evaluation is Similarity-Based



$\longrightarrow$ Any method that compares two sentences can be evaluated

Selected Results

- BERT base models perform the best

	all	formal	simple	nb3r	c'tion
BERT uncased	0.74	0.79	0.65	0.90	0.90
BERT cased	0.77	0.82	0.68	0.92	1.0

Table: Accuracy of style methods. Random performance corresponds to 0.5.

For 14 more models & methods, see our paper ...

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share cased	0.56	0.55	0.53	0.50	1.0

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- BERT base models perform the best

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- word length predicts complexity similar to [Paetzold and Specia, SemEval 2016 Task 11: Complex Word Identification, 2016]

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share cased	0.56	0.55	0.53	0.50	1.0
word length	0.58	0.53	0.59	0.50	0.94

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- 1830 tasks across 4 dimensions
- Baseline results for 18 models
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Future Work

- additional STEL dimensions
- tasks testing for "style over content"

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Data & Code: `github.com/nlpsoc/STEL`

`@anna_wegmann` `@dongng`