Zero-Shot Stance Detection: A Dataset and Model using Generalized Topic Representations

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Zero-Shot Stance Detection

Motivation

What opinions are implicitly conveyed in new articles?
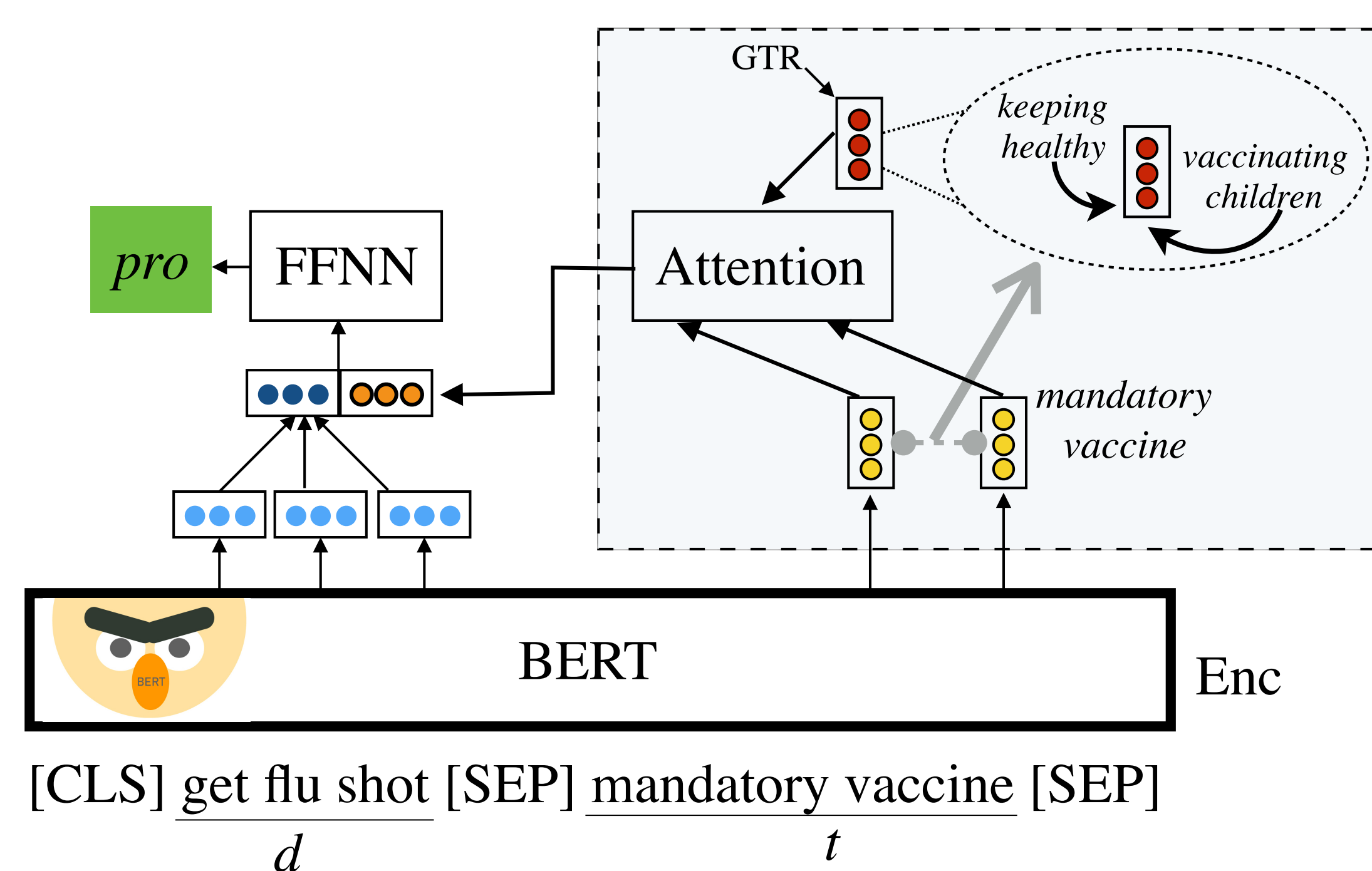
> **Topic:** immigration   **Stance:** against
>
> **Text:** The jury's verdict will ensure that another violent criminal alien will be removed from our community for a very long period . . .

Contributions:

- VAST: a **new dataset** for zero-shot and few-shot stance detection with many topics
- TGANet: a **new model** using generalized topic representations
  - Improves on challenging linguistic phenomena
  - Relies less on sentiment cues

TGANet

Goal: construct & use *implicit* relationships between seen and unseen topics

- unsupervised, no human knowledge!

Topic-Grouped Attention (TGA):

1. Cluster semantically similar topics
2. Assign *unseen* topic to closest cluster centroid (GTR)
3. Compute similarity between unseen topic and GTR with *attention*

VAST Data Collection

VAried Stance Topics (VAST)

Source: Comments from debate articles on *The New York Times*

	Comment	ARC Stance	Topic	ℓ
(1)	... Instead they have to work jobs (while their tax dollars are going to supporting illegal aliens) in order to put themselves through college [cont]	*Immigration* is really a problem	immigration	Con
			~~a problem~~ ↵	
			costs to american citizens	Con
(2)	Why should it be our job to help out the owners of the restaurants and bars? ... If they were paid a living wage ...[cont]	Not to tip	~~workplace~~ ↵	
			living wage	Pro
			restaurant owners	Con
(3)	...I like being able to access the internet about my health issues, and find I can talk with my doctors ... [cont]	*Medical websites* are healthful	medical websites	Pro
			home schoolers	Neu

Statistics

Ori Topic	8010
List Topic	11531
Neutral	3984
Total Ex	**23525**
Topics	5634

Annotation

1. *Heuristic-based topic extraction*
   - Existing Valence+topic label → (1) and (3)
   - categories from *NYT* → (2)

2. *AMT annotation*
   - Stance labeling → ℓ
   - Topic correction → (1)
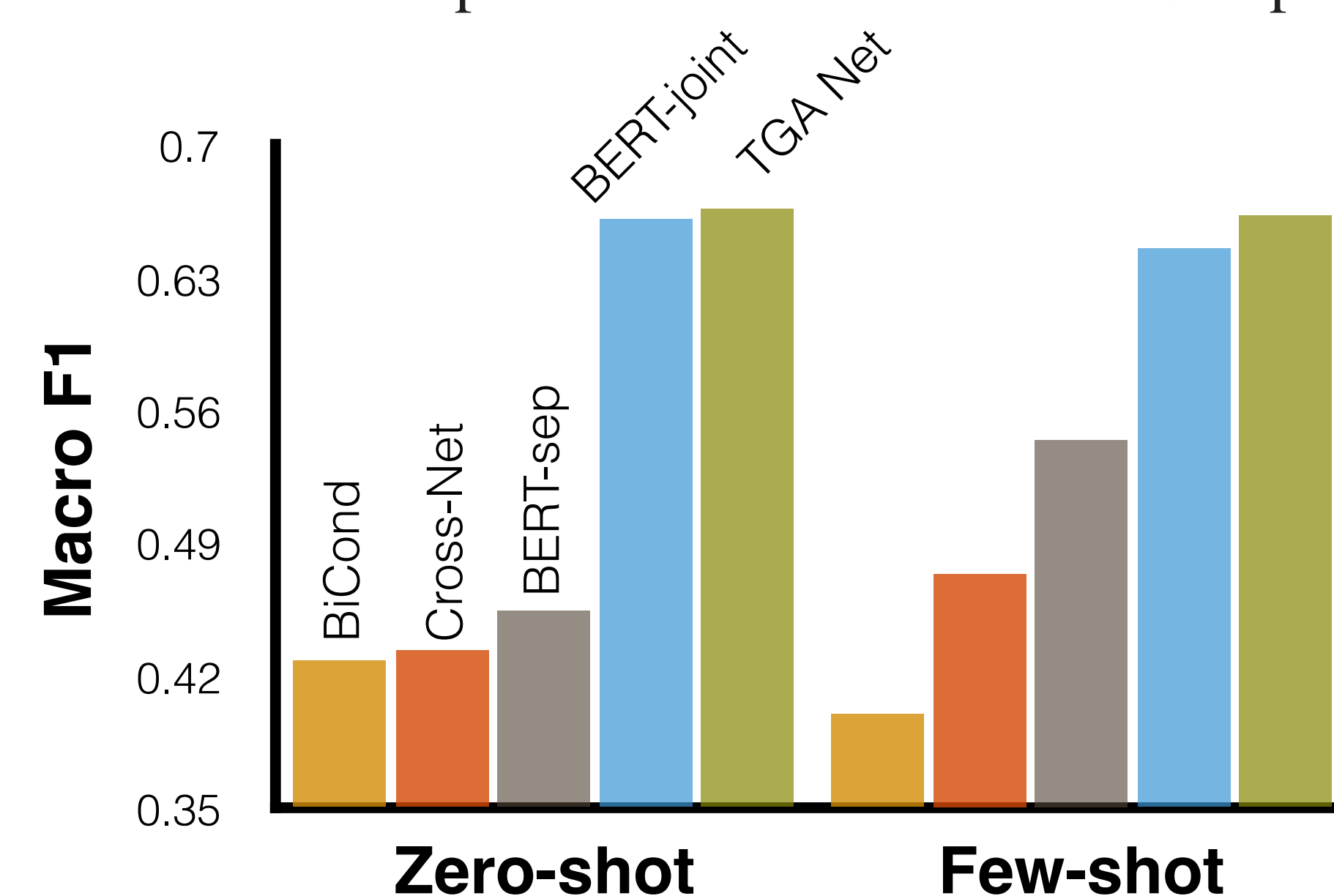   - List other relevant topics → (2)

Observations

- Lexical variety in topics
- Multiple labels or topics per doc
- Topic corrections: ∼30% of time
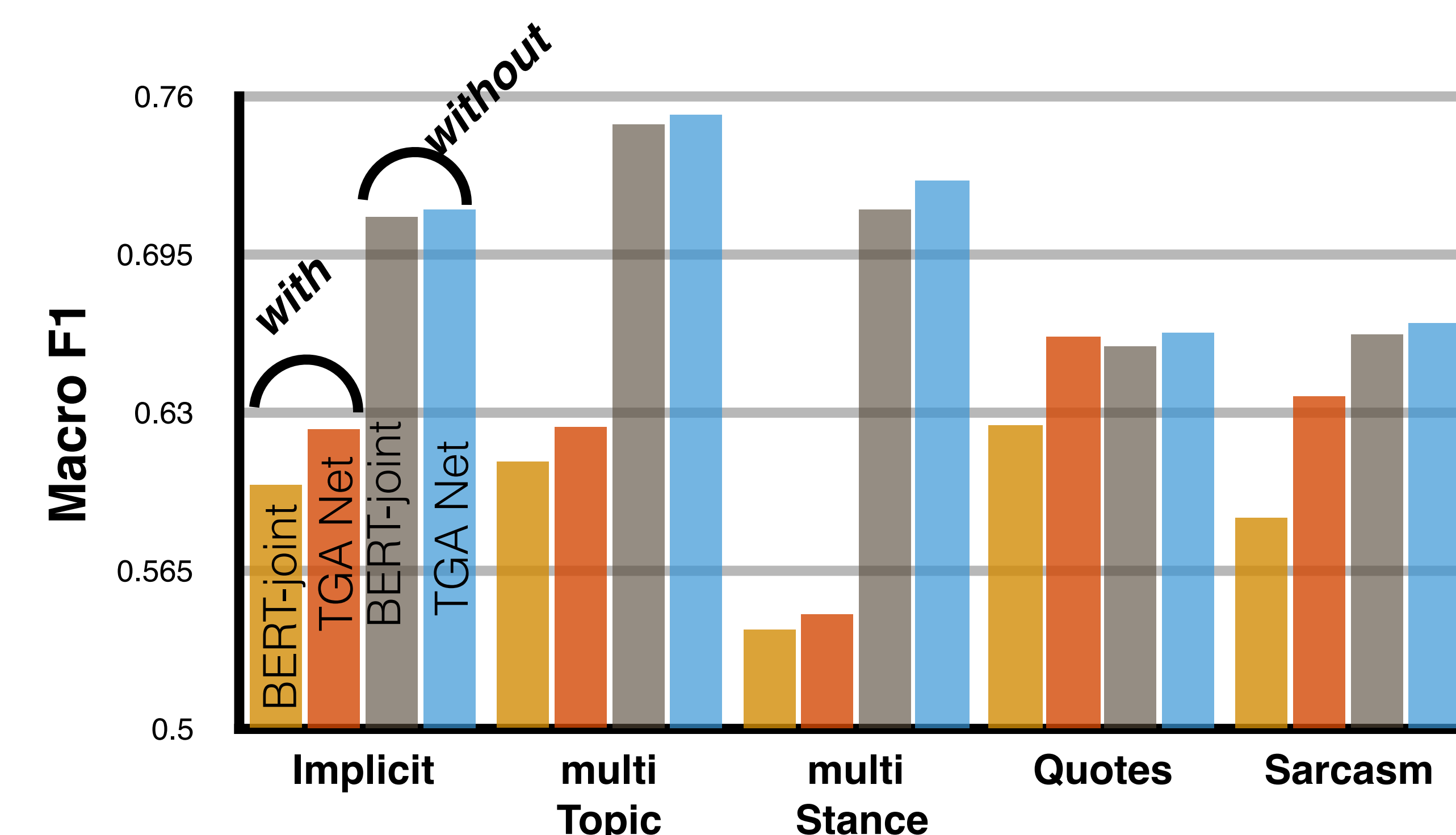
Evaluation and Analysis

Stance Prediction

Zero-shot: 600 topics   Few-shot: 159 topics

Hard Phenomena

Dependence on Sentiment: swap sentiment words to confuse models

> ... debaters don't ***strike(-)*** →***shine(+)*** me as being anywhere near diverse in their perspectives on guns. Not one of the gun-gang cited any example of where a student with a gun saved someone from something ***terrible(-)*** →***tremendous(+)*** on their campuses. At *least(-)* the professor speaks up for ***rationality(+)***.   guns

Sentiment words are ***bold italicized***, removed words (~~struck out~~), and positive (green (+)) and negative (red (-)) sentiment words.