Empathy Classification in Text-Based Online Mental Health Forums

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Introduction

Motivation

- Issues with Empathy in responses

- Prior work:

    - Sharma et al: EPITOME

    - Classification / mention detection

    - Domain-specific fine tuned LLMs

    - Biases in pre-trained models

Our contributions

- Feature engineering

- Smaller dataset

EPITOME Framework

Emotional Reactions   Expressing emotions experienced by seekers.
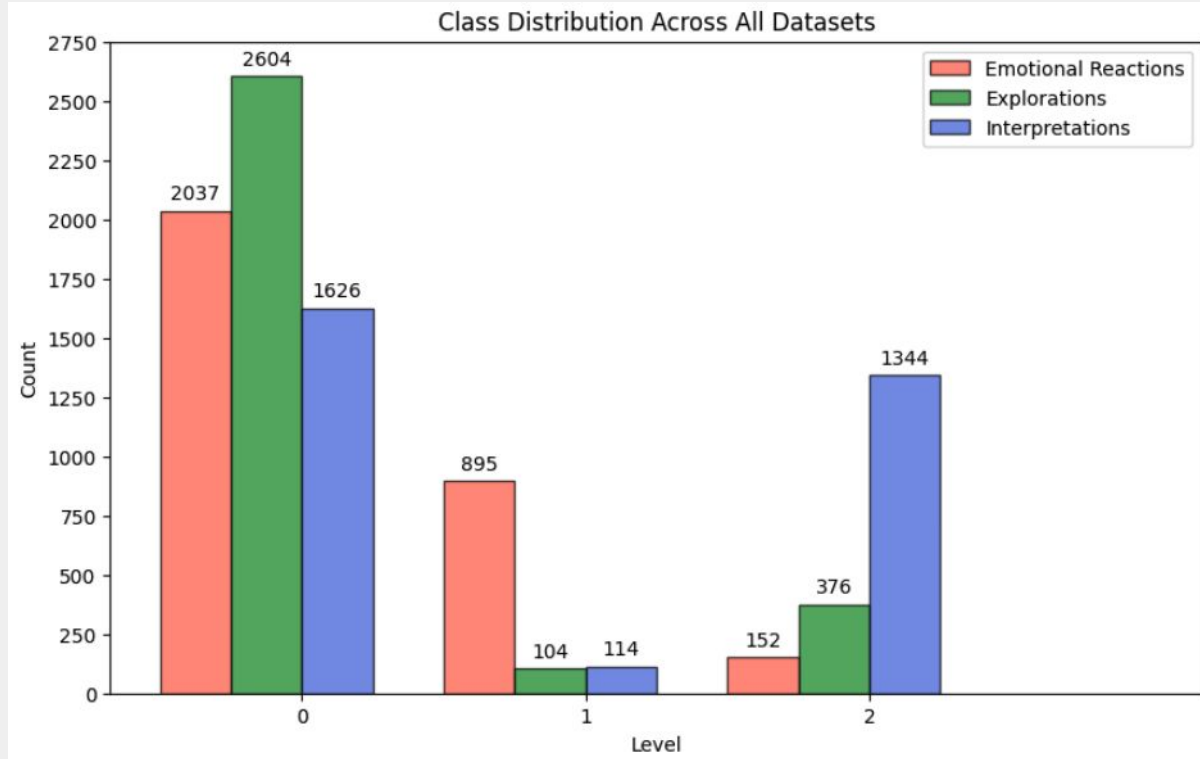
Interpretations   Communicating an understanding of feelings and experiences from seekers.

Explorations   Exploring feelings and experiences not stated in seekers to improve understanding.

Data Collection

Class Distribution Across All Datasets

Some Examples

| Seeker_post	Response_post	Labels
The sadness will last forever. I feel so lonely and empty and nothing is working	The sadness will not last forever. Tell us more about your predicament and I'll offer some advice and help!	Em: 1 In: 0 Ex: 1
My diet becomes fucked when i get depressed.. I can't control myself in the grocery store when I'm feeling down. Chips, cookies, soda, cake, you name It. Anyone else a stress eater?	By any chance do you think you're in a loop? Junk food can make you depressed. And being depressed probably makes you eat more junk food? For a while that was my problem too. Even if its just random, ill probably binge and feel bad later. Only to indulge in more later to try to cheer up.	Em: 0 In: 1 Ex: 1

Back Translations

Original post	Back-translated post	Decision
Is that really so bad? Maybe it was the smart decision because you needed that time to recover. You're being kind to yourself when you need it and that's important. Hope you feel better soon.	Is that really so bad? Maybe it was the intelligent decision because you needed that time for recovery. You are being kind with yourself when you need it and that is important. I hope you feel better soon.	Accepted
What were you taking before vs what are you taking now? Are you being prescribed by your general doctor or a psychiatrist? Do you feel like you are in danger right now?	What were you taking before what you are taking now? Are you being prescribed by your general practitioner or a psychiatrist? Do you feel that you are in danger at this time?	Accepted
Hey, what's up? Why do you feel like this?	Hello! How are you? Why do you feel that way?	Accepted
Why do you feel your time is almost up?	Why do you feel that your time is almost awake?	Rejected
I always wondered, why are people so obsessed with prolonging their lives?? Are you just into pain?	I always wondered, why are people so obsessed with prolonging their lives? Does it hurt alone?	Rejected
What makes you say these things?	What does these things tell you?	Rejected

Methods & Experiments

- Naive Bayes Baseline

- Feature Engineering with BERT

- RoBERTa and ALBERT
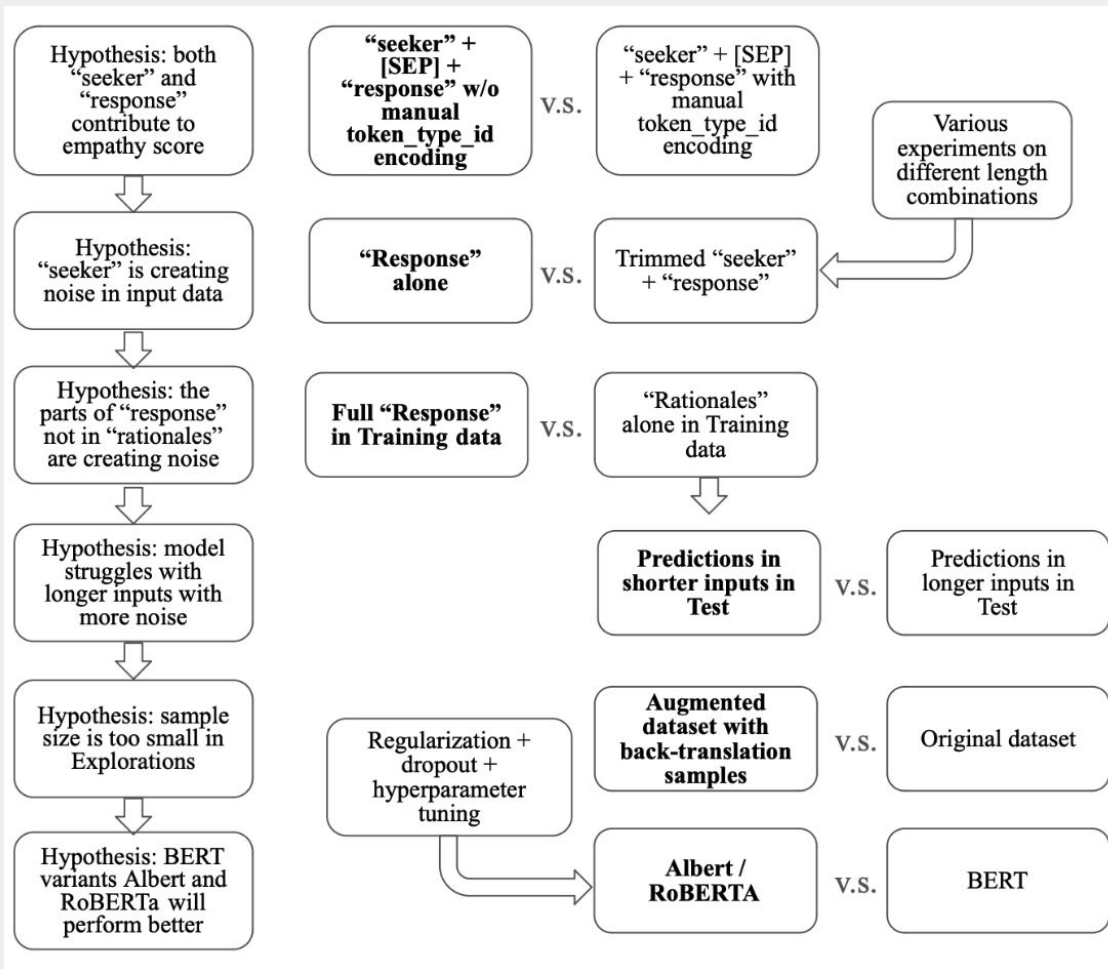
Results

Dataset	Metrics	Naive-Bayes	BERT					Best Features	
		Baseline	Seeker and Response	Response: Mean Max Length	Response: Mean+1SD Max Length	Rationale Replacement	Rationale Replacement: Short Test	RoBERTa	ALBERT
Emotional Reactions	Accuracy	67.06	**78.23**	74.22	76.85	71.12	74.22	**80.91**	76.13
	F1-Score	72.29	**77.75**	75.23	72.68	68.07	71.79	**80.77**	76.08
Interpretations	Accuracy	66.45	76.41	80.06	**81.69**	81.04	78.55	**84.28**	82.33
	F1-Score	67.71	73.23	76.84	**80.55**	78.13	66.67	**82.89**	78.92
*Explorations	Accuracy	67.19	80.56	81.78	**83.33**	80.73	90.91	88.54	**92.71**
	F1-Score	67.02	78.22	81.68	**82.22**	75.17	92.31	88.04	**92.22**

* Results for explorations dataset before augmentation

And other findings ...

Conclusion

- 81% – 93% on accuracy

- Distinct feature engineering for each label prediction

- BERT variants increase performance

Thank You!

Questions?