

LLMs in Psychotherapy

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The 2018 Utah suicide rate was 25.1 per 100,000 population ages 10+. It is the 2nd leading cause of injury death in Utah

Utah Department of Health 2020 Suicide Report

2x

Utah males' suicide rate is over twice the size of Utah females

6th

Utah had the 6th highest suicide rate in the U.S. between 2014 and 2017 for 10+ year olds

GOALS

- Fit predictive model on features to predict suicidal ideation
 - Extract features from the data to predict suicidal ideation
 - Anonymize data

THE DATA

- Counseling session data from 1996-Present
 - Quantitative intake and before-session surveys (OQ survey)
 - Qualitative written notes from therapist
- Unique dataset because of quantitative accompaniment to qualitative data at every session

Target Variable

How much do you agree with the following statement?

In the past two weeks I have had thoughts of ending my life

The Language Model

- Llama 3 70B
- ~20 notes per hour (and improving!)
- Two passes, one for anonymization and the other for extraction

Anonymization

" of Client: xxxx is a xxxx year old xxxx xxxx who is in a dating relationship. He met with therapist via zoom and therapist explained limitations of confidentiality. He was alert and attentive. He did not have a camera, however, so therapist only had audio with him. Presenting Concern: xxxx reported that he has experienced some depressive symptoms lately, categorizing these as having difficulty being motivated. He reported making extra efforts to get up and work out even if he did not do anything else. xxxx reported that he has been questioning if depression is going to continue throughout the rest of his life, and therapist discussed the possibility that xxxx may have to manage depressive symptoms throughout his life.

History/Other Relevant Information: xxxx reported that he had begun dating a woman in the past few weeks. He reported that the relationship was progressing quickly but said that he felt that this was appropriate. He reported that mood had improved since starting to date this woman. xxxx reported that he is in his final year of school but talked with therapist about what counseling graduate programs required. Counselor Impressions: xxxx's concerns seems somewhat ill-defined now, and improvement in depression seems to be linked to being in a relationship. xxxx seems to be putting much hope on this relationship, and it remains to be seen how conflict or dissolution of the relationship would affect mood. Initial

Intervention/Treatment Recommendations: Individual therapy on a brief basis. Consent to have trainee's case supervised and video recorded: Signed."

Extraction

CASE NOTE

What is the most pressing concern that brought you to the Counseling and Career Center? xxxx accident which involved a fatality What would you like to change? the way I feel

Extracted Data

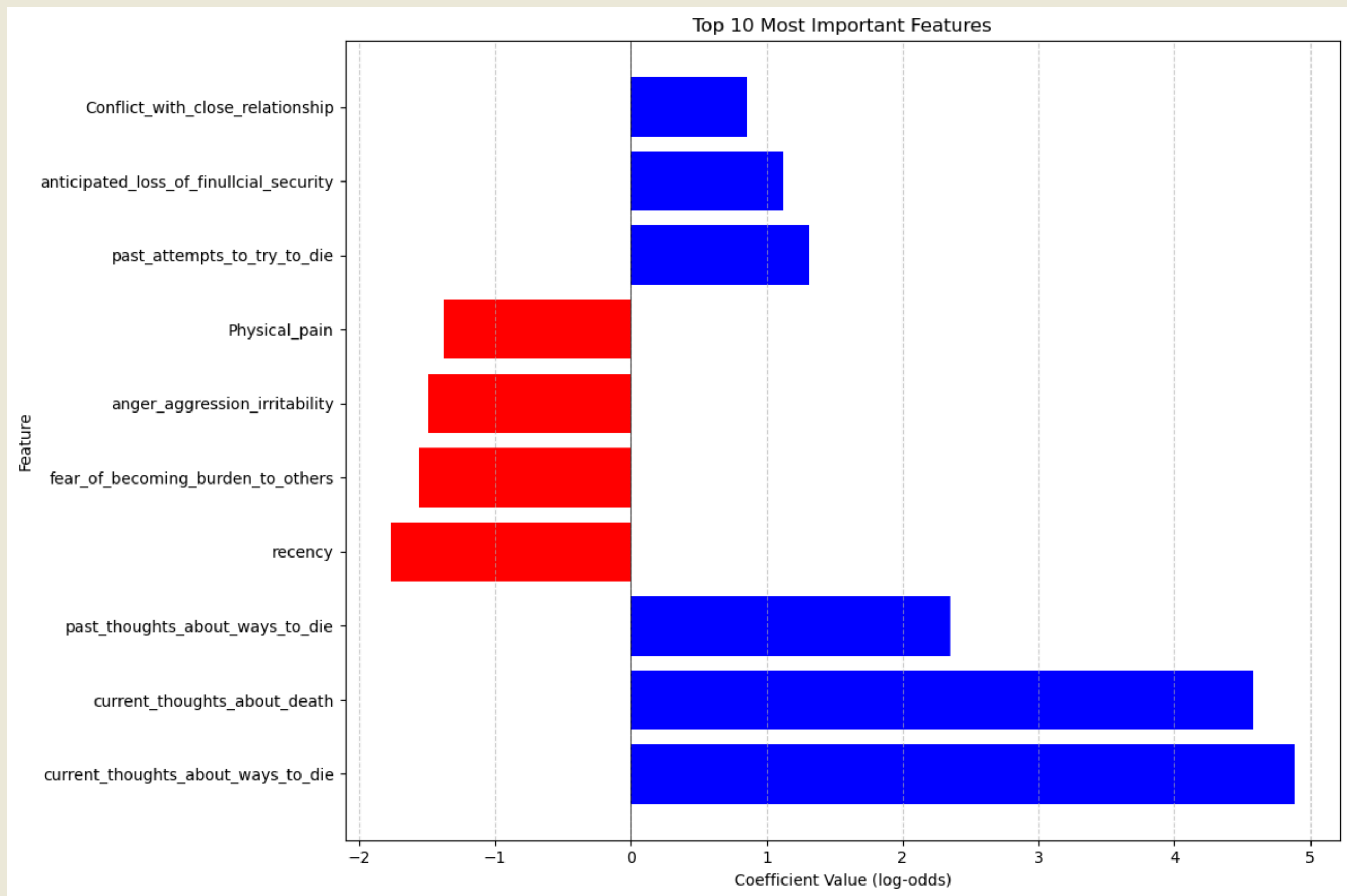
Past Thoughts about Death	Co-Occuring Mental Health Symptoms	Loss of Major Relationship	Death of Close Relationship
✓	✓	✓	✓

Confusion Matrix for Logistic Regression

	Predicted No SI	Predicted SI
OQ Reported No SI	57	37
OQ Reported SI	5	36

F1 Score: 0.63
Recall: 0.88
Precision: 0.49

*Evaluated on a random
test/validation set of 135
observations.



Next Steps

- Increase sample size
 - Speed up model
- Submit for publication
- Create predictive model for eating disorders

Thank You

DATA EXTRACTION

Question	True	False
Anger Aggression Irritability	52	631
Possibility of Being Fired/Expelled	26	657
Loss of Major Relationship	132	551
Death of Close Relationship Especially From Suicide	28	655
Fear of Punishment	24	659
Anticipated Loss of Financial Security	16	667
Fear of Becoming Burden to Others	13	670
Self Critical Thoughts	160	523
Frustration	87	596
Conflict With Close Relationship	303	380
Recency	23	660

Anonymization

"xxxx is a xxxx year old xxxx xxxx student in xxxx. He has a xxxx year old daughter. He will graduate in xxxx. He expressed concern around intrusive thoughts and how his xxxx's decline in mental health has impacted him and his family. He has no history of attending past therapy besides one walk in appointment for the same concerns. He is in xxxx and plans to work for the xxxx after graduation. Oriented X3 and appropriately dressed. xxxx did not endorse SI/HI during the session. Confidentiality was reviewed. xxxx related xxxx's mental health decline and recent schizophrenia diagnosis. He expressed how with the stress of xxxx's mental decline he has had more intrusive thoughts and would like to learn how to better handle those thoughts. We discussed how to cultivate awareness, defusion, and valued action as a way to respond to those thoughts. We also discussed how xxxx can identify when he might need more mental health support in the future."

