

Identifying depression in r/DomesticViolence



Group 2:
Ray, Dora & Marianne

Who are we?



We are America's leading community-based nonprofit dedicated to addressing the needs of those living with mental illness and promoting the overall mental health of all.

The Problem

THE INTERPRETER

A New Covid-19 Crisis: Domestic Abuse Rises Worldwide

**Lockdowns around the world bring
rise in domestic violence**

**Coronavirus: Domestic violence
'increases globally during
lockdown'**

Now, with families in lockdown worldwide, [hotlines are lighting up with abuse reports](#), leaving governments trying to address a crisis that experts say they should have seen coming.

The Problem

With the rise in domestic violence cases in recent months, more people are turning to online forums like Reddit for support.

Research have shown that domestic abuse victims are more likely to suffer mental illnesses and our aim is to **identify depressive language in domestic violence posts.**

Subreddits: The What

r/DomesticViolence

- Information and support for victims, survivors, their friends and family
- 10.7k members

↑
31
↓
 **r/domesticviolence** · Posted by u/brookieco_okie 18 hours ago
My uncle undressed me while I was under the influence of date rape drug and I feel super violated

r/Depression

- Peer support for anyone struggling with depression, the mental illness
- 650k members

↑
204
↓
 **r/depression** · Posted by u/perfectionism_ 11 hours ago
I wish I could just give my life away to someone who deserves to be alive

Subreddits: The Why

Active Groups

- Daily postings
- Large membership following

Peer Support

- Genuine posts of people's experiences
- Minimal trolling and self-promotion

Text-Based

- Simplify things for natural language processing

Initial Steps

Data Collection

- Scrapped subreddits using Reddit's API
- r/domesticviolence:
 - 998 unique posts
- r/depression:
 - 955 unique posts

Review Outliers

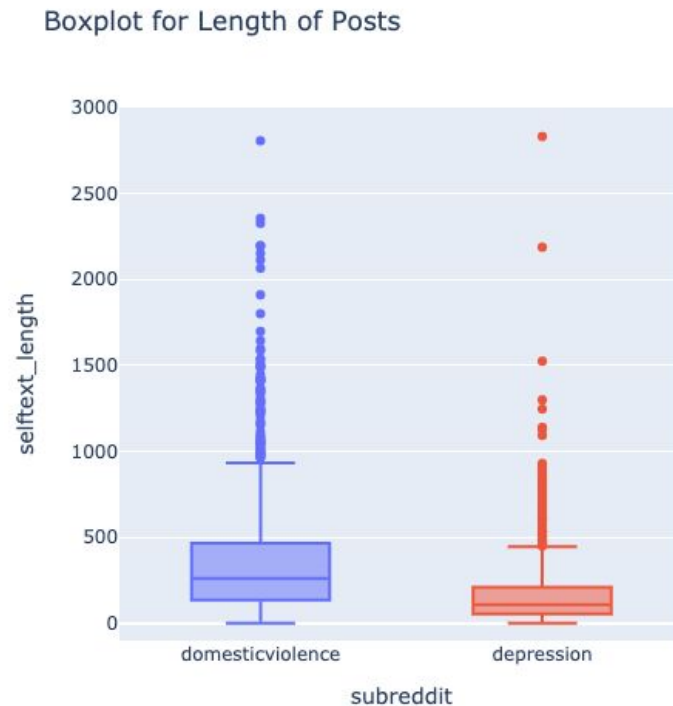
- Kept posts with extreme numbers of comments/scores as they're genuine posts

Pre-Processing

- Hot encode subreddit column
- Remove moderator posts
- Remove punctuations
- Lemmatize words
- Remove stop words

Initial Findings

1. Sufficient post lengths

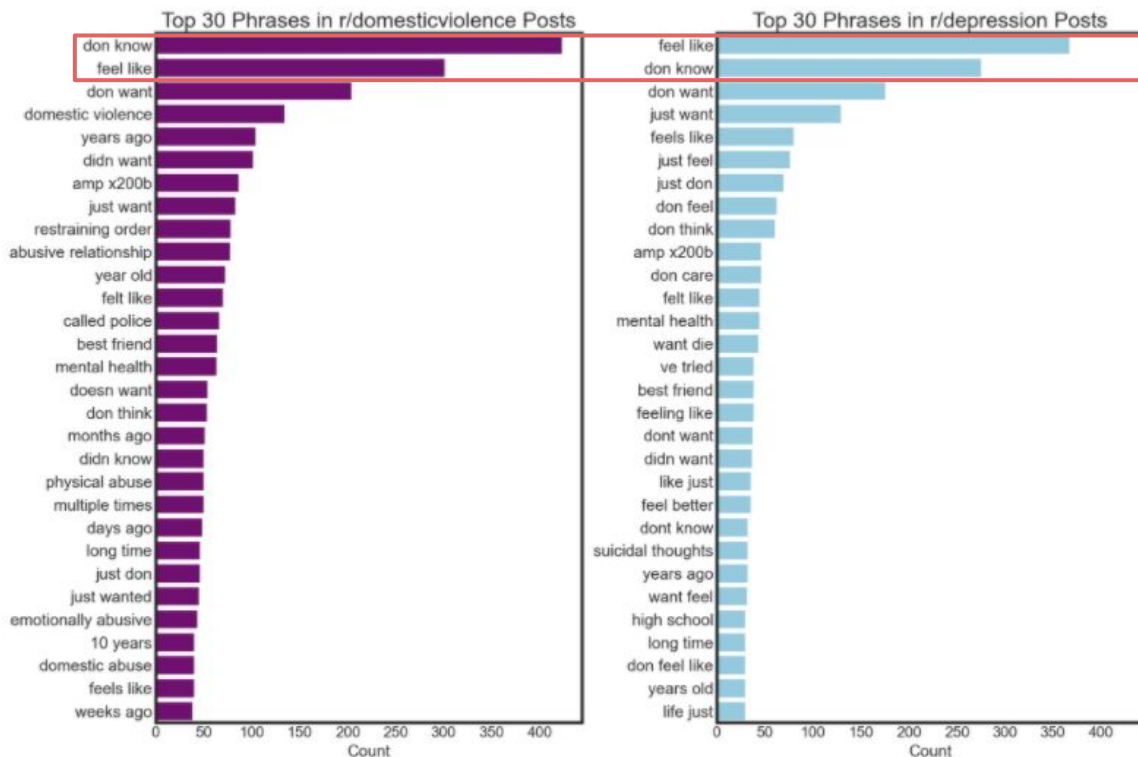


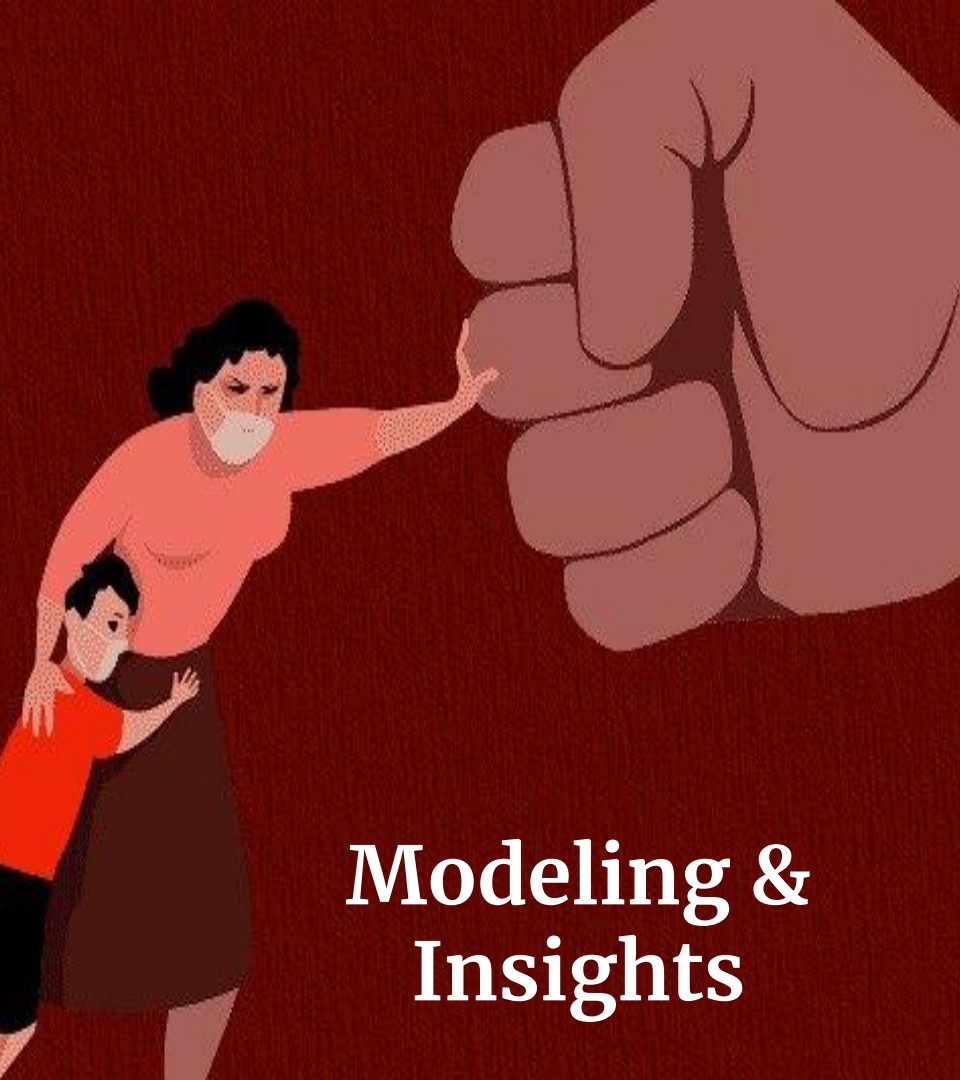
Initial Findings

1. Sufficient post lengths

2. Similar top phrases:
“feel like” & “don’t know”

3. No overlap of authors
across both subreddits





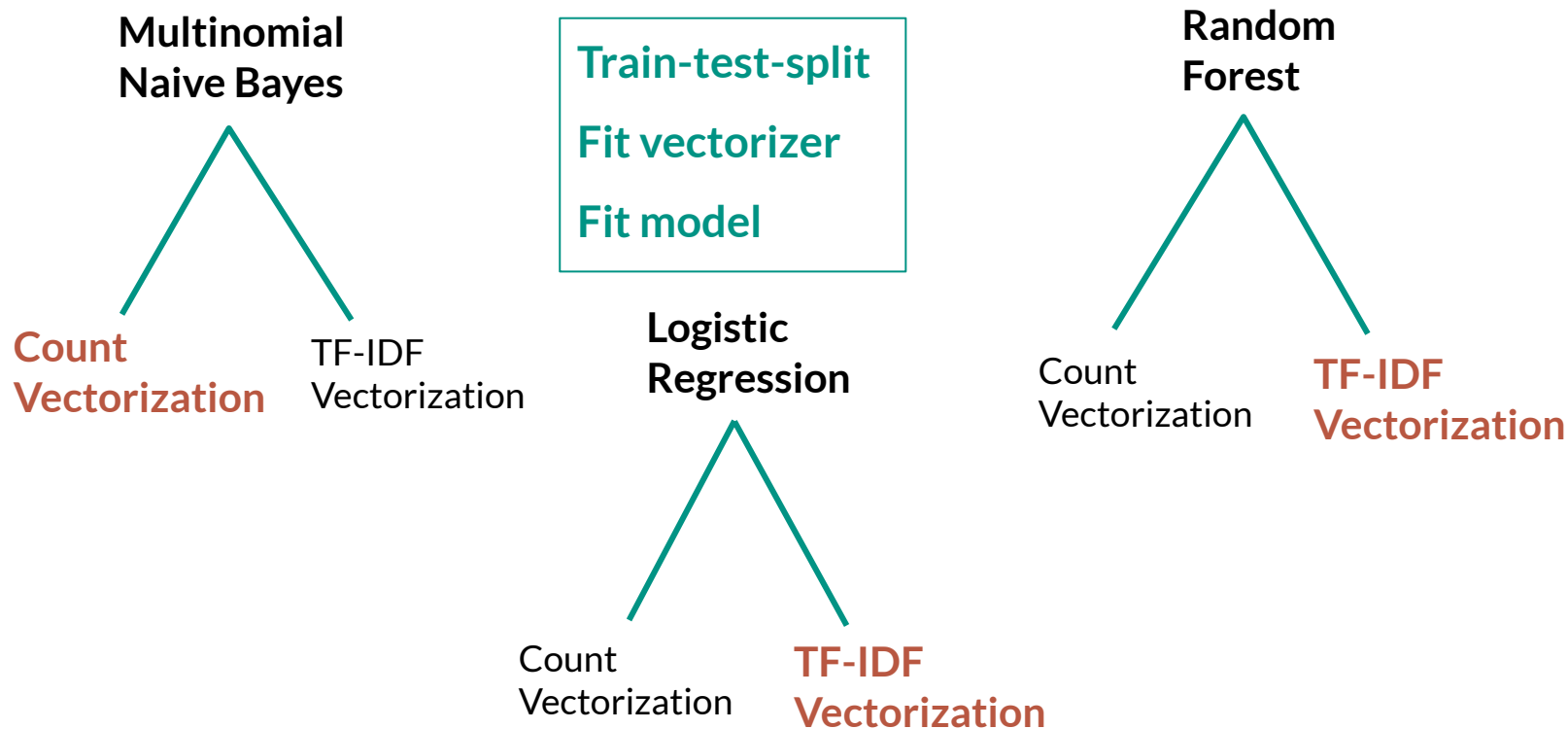
Modeling & Insights

Classification Models

- Multinomial Naive Bayes
- Logistic Regression
- Random Forest

Models should perform better than baseline score of **0.51**

Choosing the production model



Choosing the production model

Multinomial
Naive Bayes



Count
Vectorization

Accuracy: 0.92
ROC AUC: 0.98
Sensitivity: 0.93

Lowest variance between
train and test scores

Optimise
hyperparameters

Logistic
Regression



TF-IDF
Vectorization

Random
Forest



TF-IDF
Vectorization

Findings

Top words in r/depression

like, feel, want, know,
life, get, even,
people, time, really,
one, never, would,
depression, friends,
go, think, day, help,
going

Presence of these words increase
probability of predicting
r/depression



Findings

Top words in r/domesticviolence

arrested, restraining,
report, abuser, court,
cops, domestic, verbally,
threatened, violence,
order, jail, yelling,
hitting, kicked, hair,
victim, apartment,
police, violent

Presence of these words increase
probability of predicting
r/domesticviolence



Testing model on r/domesticviolence posts

Almost 3 years ago, I was **attacked**. My best guy friend tried to **rape** me and when I **fought** for as long as i could, he ended up **beating** me. It's a miracle that I didn't **die**, but I have a lifetime of effects, that I now have to deal with, including **PTSD** and severe memory loss. I also

Model predicted
r/depression

of the world the o Some away every up id **punc** im no from this shit everyday and had such amazing jobs and family and hell a **life**, and me, im unemployed, i don't have a high school diploma and I **feel** all alone. The black sheep of my family. So why are the best people with best **lives** being taken. Granted I have a great mother, wonderful brother and exceptional boyfriend who helps me, i just feel **guilty**. **Guilty** I survived and the pain its brought everyone around me. Including myself. Im just so **tired**. I hope to wake up soon.

I spent 3 months at his house and it was great in the beginning. He was so nice, always complimenting me, spending time with me, doing things for me, etc. towards the end though, things got bad again. He started using drugs, being **emotionally** and **physically abusive**, and forcing me to do everything around the house. Any money I had would be taken away from me to support his drug habit. He stopped being interested in me and wouldn't spend any time with me. I felt worse. It finally came to a point where I proceeded to **beat** him after **kicking** me in the head and lock the bedroom door. I was afraid that he was going to come in when I heard a knock. I called the cops on me. When I opened the door I was grateful to see an officer who had helped me in the past and knew that my ex had a history of **abuse** and a problem with drugs. During the **attack**, he had given me a **concussion**, a black eye, and caused **bruising** to my kidneys. Once the doctor determined that I was ok to be released, they realized that I had nowhere to go. They contacted the local **domestic violence** shelter where I had stayed before and they were full. After a sleepless night on a hard cot, I spent the day at social services trying to find a place to stay. I have been moved from hotel to hotel since then and have slowly been trying to get my life back. It's difficult but at least I am away from him and safe.

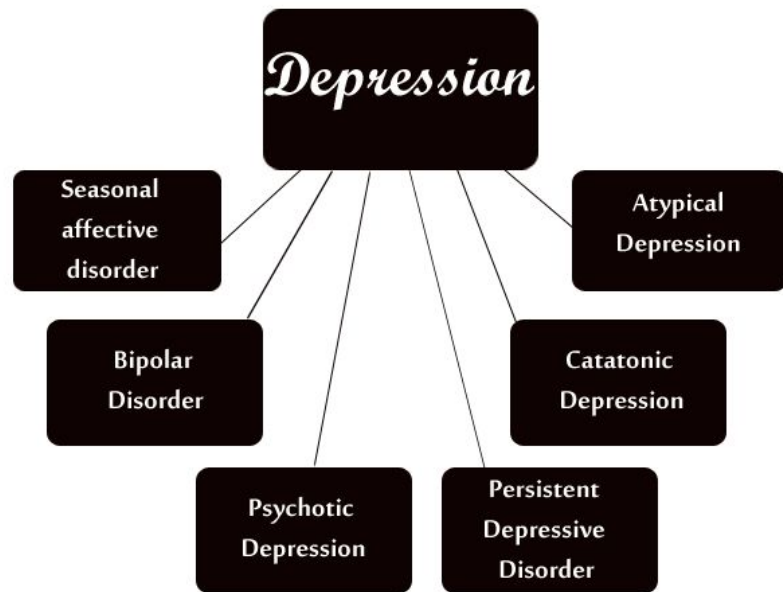
Model predicted
r/domesticviolence



Conclusions & Recommendations

Conclusion

- Model have achieved our objective in identifying depressive instances in domestic violence posts.
Accuracy: 0.92
- Enhancing our model by including more subreddits to identify more depressive key-words
- Exploring other social media like Twitter & Facebook
- Additional research:
domestic violence - depression - suicide



- (24%) of Refuge's clients had felt suicidal at one time or another
- 18% had made plans to end their life
- 3.1% had made at least one suicide attempt
- There was strong evidence for psychological distress or injury across the whole sample: 86% scored above cut off for clinical concern (n11) on the CORE-10 measure of psychological distress
- 83% confirmed feeling despairing and hopeless – a key determinant for suicidality
- 96% of those in the suicidal group reported feeling despairing or hopeless
- 49% of the suicidal group scored within the severe range of psychological distress

86% of the suicidal group reported feeling depressed

References:

<https://www.nspa.org.uk/wp-content/uploads/2018/08/New-Suicide-Report2c-Refuge-and-University-of-Warwick.pdf>

“As COVID-19 deaths rise, domestic violence murder-suicides are rising as well. In just the last week, domestic violence murder-suicides have increased 100%.”

References:

<https://www.allianceforhope.com/the-pandemic-within-the-pandemic-we-need-to-offer-hope/>

Recommendation

- Countless number of topics we can include to improvise our model!
- We look forward to detecting and identifying domestic violence victims and reduce suicide rates for our human population through our model.
- The findings of our models will be useful for researchers, psychologist who are interested to understand more on how a person who is facing domestic violence and having suicidal thoughts, behaves and present their thoughts and feelings in the online communities.



Thank you!

The love of a family is life's greatest blessing.