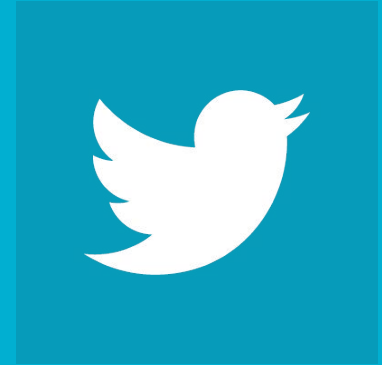


# Factors Related to Twitter Engagement in Anxiety Support Seeking

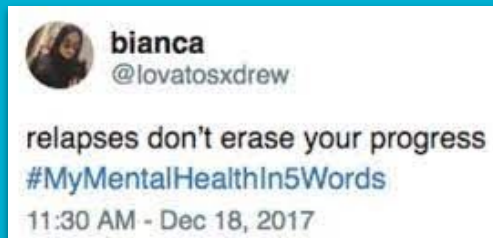
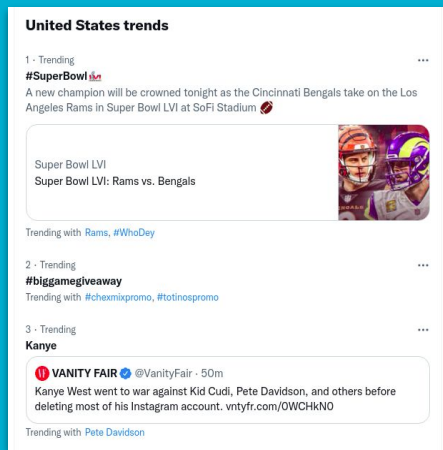
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# Background

- Twitter has 353M monthly active users<sup>1</sup>
- 500M tweets sent per day<sup>1</sup>
- Included are discussions about mental health (MH)
- Twitter allows a series of options for users to share their MH experiences - as well as receive engagement



<sup>1</sup> <https://www.wordstream.com/blog/ws/2020/04/14/twitter-statistics>

# Motivation and Significance

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- Increase in individuals seeking mental health support on social media
- No definable space on Twitter for individuals to seek support
  - Different from Reddit (subreddits) or Facebook (groups)
- Uncertainty regarding best method to solicit responses to disclosure



# Related Work

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## Improving Offline Support Systems

- **Role of social media in tackling challenges in mental health** — (De Choudhury, 2013)
- **Catalyzing social support for breast cancer patients** — (Skeels et al., 2010)

## Investigating Online Social Support Systems

- **Building an online community of care: Tumblr use by transgender individuals** — (Hawkins & Haimson, 2018)
- **Supporting Constructive Mental Health Discourse in Social Media** — (Blair & Abdullah, 2018)

## Analyzing Behavior in OMHC

- **Social Support is Contagious: Exploring the Effect of Social Support in Online Mental Health Communities** — (Chen & Xu, 2021)
- **Crazy mad nutters: The language of mental health** — (Hwang & Hallingshead, 2016)

# Gaps in Related Work

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- Do not examine specific mental health topics
- Do not examine Tweet metadata and sentiment relationships
- Do not examine hashtags in the context of mental health on Twitter
  - Past studies done on Reddit subreddits, Tumblr tag searches, etc.

## Building an Online Community of Care: Tumblr Use by Transgender Individuals

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### ABSTRACT

Scholars are starting to understand transgender people use social media to create online communities to discuss aspects of their lives. Tumblr, a social media site that allows people to share information often via tags targeted for specific groups (e.g., #ftm, #mtf, or #trans), is a virtual space commonly used by transgender people to seek or share information. We collected interview data on English-speaking transgender people's experiences to understand the connection between Tumblr and transition-related mental health posts. Tumblr was described as a safe space for many transgender people who might lack a physical community of support when dealing with their mental health while transitioning. This paper contributes a description of the ways transgender people use Tumblr to meet their mental health needs. Analyzing transgender Tumblr users' interactions and experiences while transitioning provides an opportunity to understand a population that faces high rates of mental health challenges.

### CCS CONCEPTS

Human-centered computing → Human computer interaction (HCI)

### KEYWORDS

Social media; mental health; Tumblr; transgender; LGBTQ

### 1 INTRODUCTION

Across multiple disciplines, scholars are starting to understand the ways transgender people ("people who move away from the gender they were assigned at birth, people who cross over (trans-) the boundaries constructed by their culture to define and contain that gender" [10], which we abbreviate as "trans") use social media to create online communities to discuss aspects of their lives [4, 6]. This body of literature describes various aspects of how trans people have incorporated social media into their everyday lives along with some of the ongoing obstacles with social media platforms [5]. Social media produces space for trans people to share their lived experiences and find out information that otherwise might not be available in physical spaces inhabited by these people [8].

However, important research gaps remain in the trans information, communication, technology (ICT) literature [6]; namely, little research has examined social media's benefits for trans mental health. Previous research has described the barriers experienced by trans people when trying to access information, making trans people feel invisible when trying to access information [8]. Thus, trans people often use Tumblr to create channels for sharing information and individual experiences [6]. Other recent studies have investigated access to information for parents of gender creative and trans children in Canada [11]. A growing body of scholarship has examined social media's role in various

# Problem Definition and Goal

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**Research Question:** What is the most effective way to seek support for anxiety on Twitter?

- Which tweet features will elicit **the most engagement**?
- Which tweet features will elicit **the most positive responses**?
- Are there **other factors** that contribute to the effectiveness?

**Project Goal:** We will investigate how the volume and sentiment of responses to anxiety-related tweets are influenced by hashtags, profanity, and other factors.

- “If a post my tweet with a certain hashtag (for example), am I more likely to receive more positive replies or more support?”

# Data Gathering

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1. Build relevant keyword set from anxiety subreddit scrapes
  - r/anxiety, r/anxietyhelp, r/healthanxiety, etc.
2. Validate 34 initial keywords
  - Pulled 25 tweets per keyword from Twitter for annotation
  - Acceptance = majority tweet relevance & annotator agreement
3. Narrowed candidates to 6 final keywords
4. Pulled 10,000 tweets for each keyword (5000 with hashtags, 5000 no hashtag)
5. Pulled all tweet reply chains

# Dataset Description

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Number of Tweets: 42,569

Number of Tweets with Replies: 11,724

Number of Total Replies: 51,414

Datetime Range of Tweets: 11/02/2009 - 04/05/2022



# Approach/Method

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## Linear Regression:

- To determine features which influence volume of response
- Created a variable 'interaction\_score'
  - $(\# \text{ of quotes}) * 10 + (\# \text{ of replies}) * 5 + (\# \text{ of retweets}) * 3 + (\# \text{ of likes})$

## Linear SVM:

- To determine features which influence sentiment of response
- Sentiment of response = average sentiment of the replies
  - 0 if negative, 1 if positive

# Features

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Positive Sentiment	Positivity score of tweet (using VADER)
Negative Sentiment	Negativity score of tweet (using VADER)
Contains Hashtag	0 if no hashtags present, 1 if hashtag present
Capitals	% of letters which are capitalized
Mentions	0 if no users tagged, 1 if other user(s) tagged
Swear Words	% of words which are swear words
Uses Profanity	0 if no profanity present, 1 if profanity present
Contains Question	0 if there is no question, 1 if there is a question
Number of Words	Normalized length of tweet
Time of Day	Normalized hour of day tweet was posted
First Person	0 if no first person pronouns present, 1 if there are

# Results

MAE (Interaction Score): 9.533

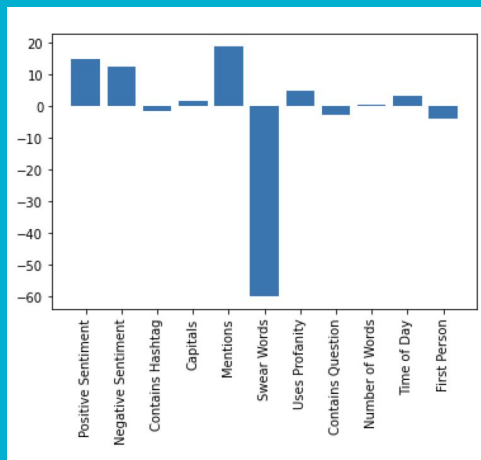
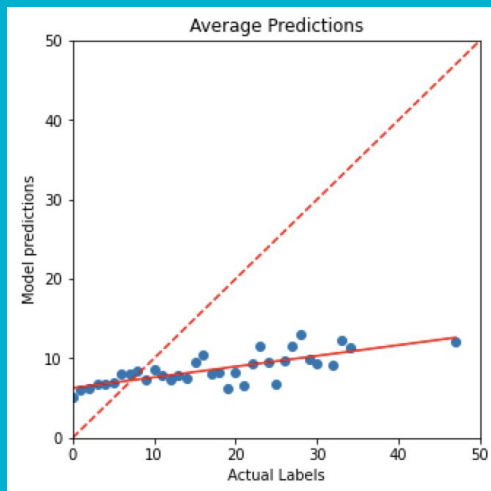
MAE (Like Count): 5.890

Significant Positive Correlation:

- Positive Sentiment
- Negative Sentiment
- Mentions

Significant Negative Correlation

- Swear Words



# Results

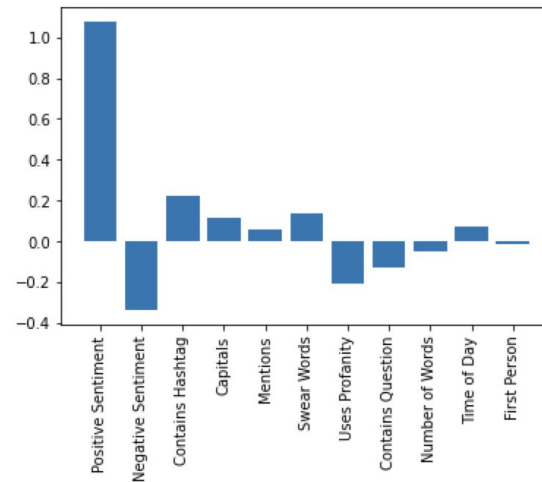
Significant Positive Correlation:

- Positive Sentiment
- Contains Hashtag

Significant Negative Correlation

- Negative Sentiment
- Uses Profanity

Precision	.846
Recall	.538
F1 Score	.658
Specificity	.682
AUC	.610



# Implications

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- We have identified some 'controllable' aspects of Tweets which can positively or negatively affect the volume and sentiment of the response they get
- Other features such as structure and length of the tweet, as well as use of keywords (unigrams, bigrams) were not reliable predictors
- Narrative-based model
  - Desire, Family, Money, Job, Student
  - Not a good predictor of engagement
- Depth-Sentiment Analysis

Questions?