Does Social Media Behavior Reflect Users' Anxiety - A Case Study of Twitter Activities

Tian Wang, Masooda Bashir

Presenter: Tian Wang
Illinois Informatics, University of Illinois, Champaign, USA
Email Address: tianw7@illinois.edu
Tian Wang

• PhD student in Informatics at University of Illinois, Urbana-Champaign

• Publications:
  
  
  
  
Research Interests

• Social media analytics
• Health informatics, especially on mental health assessment and prediction
• Privacy considerations for online environment, such as social media platforms, cloud computing, etc.
Introduction

• Anxiety disorders are very common among children, adolescents, and young adults
  • In 2012, about 30% of young adults aged 18-29 in U.S. have some type of anxiety disorders

• However, assessment and treatment for mental illness are considered to be insufficient in the recent past
  • About 75% of nearly 10,000 people with generalized anxiety disorder or social anxiety disorder didn’t receive any treatment

• It is necessary to explore new approaches to provide more effective mental healthcare services
  • Use of social media
Study Goals

• This research study aims to examine the relationship between young adults’ social media (Twitter) behaviors and their mental health status, especially general anxiety level

• Research questions:
  • Is there a relationship between Twitter activities and one’s anxiety level?
  • Are there any differences in Twitter activities among people with symptoms of anxiety and people without such symptoms?
Methods

• Participants were recruited randomly via Amazon Mechanic Turk (MTurk) to complete an online survey including:
  • General Anxiety Disorder-7 (GAD-7)
  • Questions related to social media usage
  • Twitter link (with permission)
  • Basic information (gender, age, etc.)

• A total of 200 participants were randomly recruited from MTurk
• 95 responses were recorded after excluding noisy data
• By using Twitter link provided by each participant, data on all the publicly available information was collected
  • User profile, Tweets, Retweets, Reply, Likes, Following, Followers, ...
Methods

• To analyze Twitter data, three elements were measured:
  1. Overall engagement: Number of Tweets, Retweets, replies, liked Tweets, followers, and followings
  2. Negative emotions: Frequency of words with negative sentiment used, and if any negative attitude was exhibited in Twitter activities
  3. Level of personal information revealed publicly:
     • Profile photo: Is the user’s selfie being used as profile photo?
     • Profile description: Is there any personal identifiable information disclosed in the profile description?
     • Media posts: Is there any media post (photo or video) related to user’s personal life?
Results

• Overall Engagement

Statistics on engagement

<table>
<thead>
<tr>
<th>Participants</th>
<th>With anxiety symptoms N=34</th>
<th>Without anxiety symptoms N=61</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average # of Tweets</td>
<td>4970.30</td>
<td>4138.04</td>
</tr>
<tr>
<td>Average # of following</td>
<td>449.96</td>
<td>373.13</td>
</tr>
<tr>
<td>Average # of followers</td>
<td>190.18</td>
<td>229.42</td>
</tr>
<tr>
<td>Ratio of Following/Follower</td>
<td>2.37</td>
<td>1.63</td>
</tr>
</tbody>
</table>
## Results

- **Negative Emotions**

Word frequency for original posts

<table>
<thead>
<tr>
<th>Rank</th>
<th>With anxiety symptoms</th>
<th>Without anxiety symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>love (0.27%)</td>
<td>love (0.74%)</td>
</tr>
<tr>
<td>2</td>
<td>good (0.20%)</td>
<td>good (0.52%)</td>
</tr>
<tr>
<td>3</td>
<td>new (0.12%)</td>
<td>new (0.52%)</td>
</tr>
<tr>
<td>4</td>
<td>better (0.10%)</td>
<td>liked (0.41%)</td>
</tr>
<tr>
<td>5</td>
<td>great (0.09%)</td>
<td>best (0.40%)</td>
</tr>
<tr>
<td>6</td>
<td>best (0.09%)</td>
<td>chance (0.38%)</td>
</tr>
<tr>
<td>7</td>
<td>happy (0.08%)</td>
<td>right (0.37%)</td>
</tr>
<tr>
<td>8</td>
<td>over (0.07%)</td>
<td>never (0.37%)</td>
</tr>
<tr>
<td>9</td>
<td>stop (0.06%)</td>
<td>happy (0.33%)</td>
</tr>
<tr>
<td>10</td>
<td>bad (0.05%)</td>
<td>amazing (0.27%)</td>
</tr>
</tbody>
</table>
Results

• Level of Personal Information Shared Publicly
  • Participants with less or no anxiety symptom (21 out of 61, 34.4%) are more likely to use their selfies as profile photos than participants with anxiety symptoms (7 out of 34, 20.6%)
  • 13 of 61 participants with less or no anxiety symptoms had detailed information about themselves in profile description, while only 2 of 34 participants reported anxiety symptoms included some basic level of personal information
  • Participants with less or no anxiety symptoms were also more willing to post photos and videos about themselves, family, and friends
Discussion

• Social media behaviors may be a useful source of information for individuals’ general mental health status

• Such information could be potentially used as a novel and effective approach to identify, detect, and predict one’s mental health status along with traditional methods
  • Easy to implement
  • Include rich content coverage of an individual’s online activities
  • Provide more efficient, objective, and unbiased information sources

• It is important to address privacy violations since people could be identified and targeted while using such information
Conclusion

• This research study shows initial findings that...
  • Individuals’ social media behaviors may be relevant to their mental health status
  • People with symptoms of anxiety may behave differently than people without such symptoms
• Social media could potentially be considered as a new method for mental health assessment and treatment
• Results from this study may provide the initial steps towards a new direction in mental healthcare services that can be timely and reach broad and diverse populations