Causal Analysis of Mental Health Issues in Social Media Posts

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Overview

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3. Taxonomy
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Figure: Social media platform is a medium of **self-disclosure**

Background

- As per reports released in August 2021[1], **1.6 million people** in *England* were on waiting lists for mental health care.
- Estimated **8 million people** could not get specialist help as they were not considered *sick enough* to qualify.
- *The statistics above induce the need for* **automation in mental healthcare**.

[1] https://www.theguardian.com/society/2021/aug/29/strain-on-mental-health-care-leaves-8m-people-without-help-say-nhs-leaders

Why Social Media?

- 80% of patients do not undergo psychological treatments with mental health practitioners.
- Social media platform is a medium of **self-disclosure** with user-generated data (feelings, thoughts and emotions).
- **Self-disclosure** is a significant curative component of **social well-being**[2].
- Research community emphasises on the use of **Computational Intelligence Techniques** for Mental Health Analysis on Social Media.
- One of the *Key Components* is **Computational Linguistics** and *Computational Social Science*.

[2] Jourard, S. M. (1959). Healthy personality and self-disclosure. Mental Hygiene. New York.

Mental Healthcare: A Taxonomy

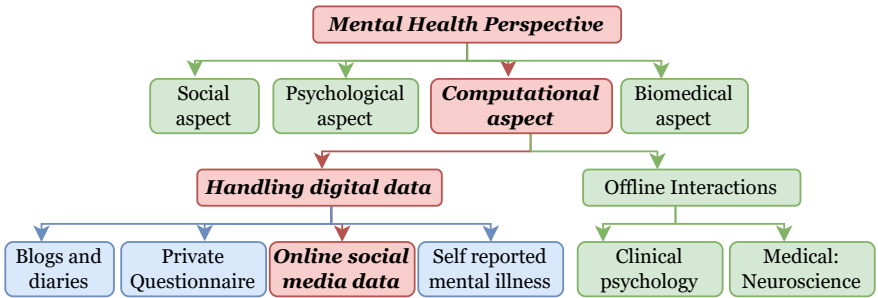

Figure: Taxonomy of Mental health perspective: The computational aspect on social media analysis is marked as bold and italics.

Computational Approach

Mental health illness on social media: Problem formulations

Classification Algorithms

Research community use machine learning and deep learning classifiers to identify Mental Illness on Social Media

Longitudinal Study

Time-varying analysis of patterns in historical timeline of users' social media profile.

Level 0 Analysis

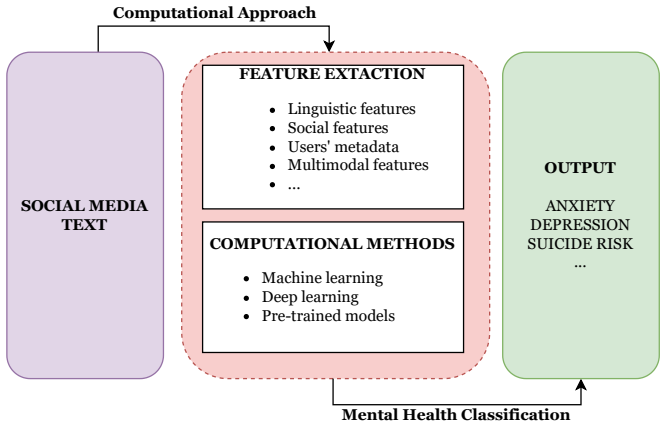

Figure: Level 0 analysis of mental illness on social media

Computational Approach

Mental health illness on social media: Problem formulations

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Causal Analysis

Cause detection in social media text, causal explanations and cause categorization gives new research direction to research community.

Computational Approach

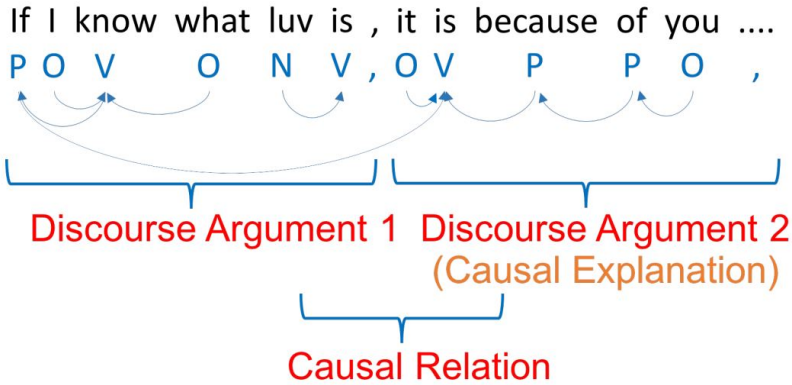

Figure: Son, Y., Bayas, N., Schwartz, H. A. (2018). Causal explanation analysis on social media. arXiv preprint arXiv:1809.01202.

Social media corpus

T1: I am done with my life after two years with no job
T2: Panic attacks and insomnia is deteriorating my mental peace
T3: She has no time for me. Family is a myth. Feeling lonely.
T4: Unable to cope up with my grades and university exams. Hopeless
T5: Help me or I ll do something to myself
T6: Life is useless.

Figure: Corpus of mental health posts

Cause detection and Causal explanation

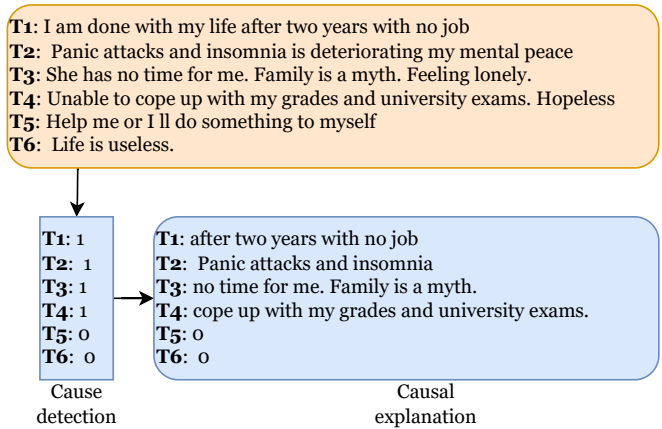

Figure: Son, Y., Bayas, N., Schwartz, H. A. (2018). Causal explanation analysis on social media. arXiv preprint arXiv:1809.01202.

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[3] https://www.daimanuel.com/2020/02/11/the-most-common-causes-of-mental-health-problems/

Cause categorization

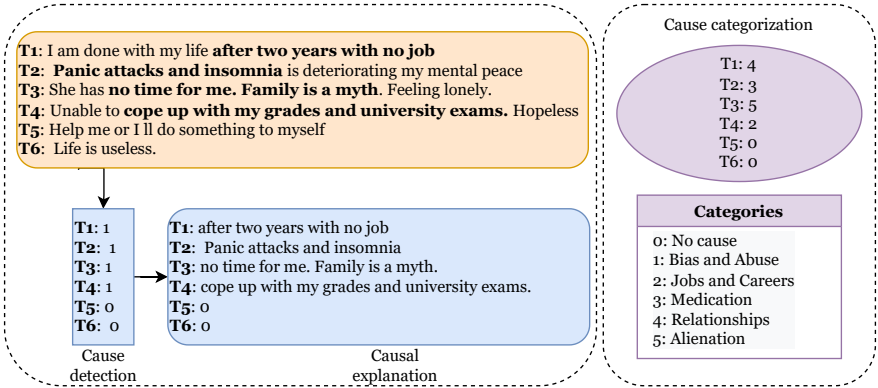

Figure: Cause categorization

Research gaps and challenges

- Long and complex texts in real-time social media data: Gab and Reddit.
- Availability of dataset for causal analysis
- Ethical constraints due to sensitive nature of data
- Explainable AI models for causal analysis of mental illness.

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[4] https://therapeuticplayfoundation.org/resources/mental-health-services/

New Frontiers

In-person Sessions

Clinical psychologist determines the cause behind mental illness of a of a patient after multiple offline sessions.

TASK: To simulate this analysis with **computational intelligence techniques**:

Cross Sectional Study

Identifying reason behind mental illness in a single post which may or may not be reliable. (Assumption)

Longitudinal Study

Time-varying analysis of multiple posts from users' historical timeline can give better insights about cause behind mental illness. (Assumption)

Summary

- **Taxonomy**
- Computational linguistics can determine mental illness on social media posts: **Why?**
- Computational linguistics can determine mental illness on social media posts: **How?**
- Computational linguistics can determine mental illness on social media posts: **To what extent?**
- **Challenges and New Frontiers**

The End