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Communications 188C

June 4th, 2025

### Research Paper Review

In the first article “Gun Culture in Fringe Social Media” the primary motivation is to understand how gun culture is expressed and possibly intensified in online communities, specifically 4chan’s /k/ board. The authors aim to explore the discussions around firearms in unmoderated spaces. They aim to identify how these discussions reflect traditional gun culture, signs of emotional attachment to firearms, and indications of gun fetishism.

The main contribution is its analysis of over 4 million posts from the /k/ board, using various techniques to analyze the content. Through topic modeling, sentiment analysis, and semantic similarity, the study reveals that discussions on /k/ have both traditional and modern examples of gun culture. The research also uncovers a significant presence of gun fetishism, characterized by emotional and symbolic attachments to firearms.

To support their findings, the authors compiled a vast dataset with more than 4 million posts from 4chan’s /k/ board. The dataset provides a rich source of user content, unveiling unfiltered discussions about firearms. The depth, as well as breadth, allow for a nuanced look into the themes and sentiments in the online community.

The study employs several methods to process and interpret the data. Topic modeling techniques like BERTopic and Top2Vec are used to identify themes within the discussions. Sentiment analysis helps gauge the emotional tone of the posts, while semantic similarity,

utilizing Word2Vec, detects patterns that indicate gun fetishism. These methods collectively enable a diverse exploration of the data.

This paper dives deeper into the specific dynamics of gun culture compared to prior research. Earlier studies have looked into gun culture in a broader societal context. They have also analyzed extremist content on platforms like 4chan. However, this research focuses on gun culture within online discussions in unmoderated settings. It shows how such environments can facilitate particular attitudes toward firearms, like fetishising guns.

Assuming the study's results are valid, the implications are important. The findings suggest that online communities like 4chan's /k/ board can act as echo chambers that reinforce certain aspects of gun culture, potentially influencing individual perception and behaviors regarding firearms. These dynamics are important for policymakers, mental health professionals, and law enforcement to understand in order to properly address gun violence.

However, the research also has limitations. The anonymity and lack of demographic data on 4chan makes it hard to apply results to broader populations. The unstructured data and potential for trolling can also complicate the interpretation of sentiments and themes. Other studies could benefit from correlating findings with data from other platforms or incorporating more qualitative analysis to validate insights.

In the second paper, “Mental Health Impact of the COVID-19 Pandemic on College Students: A Quasi-Experimental Study on Social Media”, the main question revolves around understanding how the COVID-19 pandemic affected the mental health of college students over time. The authors were interested in looking into the immediate mental health consequences. However, they also studied how these effects evolved through the different phases of the pandemic, including the isolation, normalization, and vaccination periods. The psychological

effects of the pandemic are largely unstudied given the lack of real-time and longitudinal data. The study aims to fill this gap by using social media data as an agent for mental health expression.

The paper's main contribution is its experimental analysis of over 1.2 million Reddit posts from 173 U.S. college subreddits over a 17 month period during the pandemic. By comparing the "Treatment" data with "Control" data from the same subreddits two years before, the authors show how mental health expressions such as depression, anxiety, stress, and suicide changed through three phases of the pandemic. These expressions increased during the isolation period. However, a decrease was seen in the following months, but then resurfaced during the vaccination phase. The study also mapped how topical themes of student discussion shifted, providing insights into social, academic, and health concerns.

To support these findings, the authors used data scraped from Reddit. Posts from specific subreddits representing student communities were especially important. The data was divided into treatment and control groups based on time period, ensuring a reliable comparison of trends before and during. The distribution of posts were shown to be representative of the size of colleges and states, which contributes to the credibility of the data.

The study used machine learning classifiers to detect symptomatic expressions of mental health, like depression, anxiety, stress, suicide. Topic modeling using BERTopic was harnessed to uncover discussion themes. Time series and causal impact analyses were conducted to determine the significance and timing of changes in mental health expressions. These statistical techniques were applied to distinguish between pandemic effects and seasonal or academic influences.

Compared to prior work, this paper offers longitudinal data, and a real-time perspective on student mental health using statistical tools. Earlier studies focused on surveys or snapshots of mental health, while this research is across multiple pandemic phases, offering unique insights. It also focuses specifically on college students, a population shown to be particularly vulnerable during times of crisis.

If the results are valid, the implications are significant. The analysis demonstrates that student mental health evolves with prolonged exposure to stressful situations. This emphasizes the importance of prolonged mental health attention, rather than short-term solutions. Universities could use these findings to build monitoring systems that help detect emerging mental health issues so they can address harmful situations appropriately.

Even though the findings are significant, the study is not without limitations. While Reddit provides a good source of student discourse, it does not capture the experiences of all students. Especially students who are less active online or go to less represented schools. The methods also heavily rely on algorithmic classification. Despite high accuracy, they are still alternatives to clinical diagnoses. The study also does not account for data at the individual level. This makes it hard to analyze causality at a personal level. Improvements could involve cross-validating Reddit data with surveys or administrative records. Another option would be analyzing data from other platforms. These additions could potentially increase the validity of the study.