Decoding Civic Discourse: Analysis of Nextdoor Posts on 2023 Chapel Hill Elections

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I. Introduction

On November 7, 2023, Chapel Hill held a municipal election that current Town Council member Karen Stegman said put the town's identity "at stake" (Stegman, 2023). By anecdotal evidence, it was the most contested mayoral race in recent memory all because of one issue — housing. In the wake of incumbent mayor Pam Hemminger's retirement (Livingston, 2023), 'pro-affordable housing' candidate Jess Anderson and 'anti-development' candidate Adam Searing vyed for the open seat. A poll from Public Policy Polling in late October showed that 30% of respondents favored Anderson, 29% favored Searing, and 40% were undecided (Keck, 2023). In the end, Anderson won the election 59% to 41%.

Nextdoor, a hyperlocal social networking app for neighborhoods, became a popular platform for political discourse leading up to the elections. This report details an analysis on 1,070 Nextdoor posts related to the 2023 Chapel Hill municipal elections. The findings, while likely not statistically significant, suggest that Nextdoor users in Chapel Hill and Carrboro may have painted an inaccurate portrait of the community's feelings toward development and support for Searing.

II. Data and Methods

A. Acquirement of Data

To scrape the data, I downloaded html from ten threads on Nextdoor that I found by searching for key terms like "Adam Searing", "Jess Anderson", "mayor", "town council", "vote", "election" and "affordable housing". The threads were hand-selected based on relevance to the key terms and the amount of comments and reactions to the original post. All threads were from the latter half of 2023 prior to the election on November 7.

I used the Beautiful Soup package to parse through the html and extract from each post the name of the author, the neighborhood of the author, the body text of the post and the number of reactions to the post. It's important to note that one "reaction" in my data could refer to any of the six possible responses on Nextdoor, each of which convey different emotions. Therefore, the reaction metric is more of a measure of engagement to a post rather than a measure of any positive or negative sentiment.

In the end, I was left with a JSON file that contained those four data points for 1,070 posts. Of those posts, there were 159 unique authors who belonged to 101 unique neighborhoods. The distribution of posts among authors and neighborhoods was not even. The most active Nextdoor user in the data authored 192 posts, which accounts 18% for the dataset. That user belonged to the "Umstead" neighborhood, which unsurprisingly was the most active neighborhood in the data with 202 posts. It's important to keep this in mind when considering the interpretation of the analysis.

B. Topic Modeling

The first analysis I did on the data was a topic model. I cleaned the body text of each post by removing punctuation and removing stop words using the Natural Language Toolkit (NLTK). I then trained the model on the cleaned text using the BERTopic package, which produced groupings of common topics found throughout the data. To further explore the frequency of certain key terms, I iterated through the cleaned text and counted the occurrences of "searing", "anderson", "election", "vote", and "rezon" (which includes "rezone", "rezoning" and other related terms).

C. Sentiment Analysis

Next, I did a sentiment analysis on the 38 posts in the data whose body text included the term "searing". I iterated through those posts and used NLTK's VADER sentiment analysis tool to give me the compound score for each post, which is a value between -1 and 1, with -1 being the most negative and 1 being the most positive. I added that metric to the data and then iterated through it again to calculate the mean sentiment score for each neighborhood. To visualize my findings, I created a bubble map of Chapel Hill and Carrboro using the scatter_mapbox function in the Plotly Express package.

III.   **Findings**

   A. **Topic Modeling**

Figure 1 shows the bar charts produced by the topic model. The visualization shows that common terms often used together seem to relate back to topics such as the housing market ("housing", "supply", "affordable"), transportation ("cars", "bus", "parking"), development ("zoning", "developers", "build"), and civic engagement ("meetings", "council", "input").

*Figure 1: Topic Modeling Bar Charts*

My analysis also shows that the terms "election" and/or "vote" occurred 128 times in 97 posts. "Affordable housing" appeared 107 times in 80 posts, "rezon" appeared 17 times in 14 posts, "searing" appeared 44 times in 38 posts, and "anderson" appeared 15 times in 12 posts.

B. Sentiment Analysis

Nineteen unique neighborhoods had posts that included the term "searing". Of those neighborhoods, Umstead talked about Adam Searing the most with three unique authors who wrote 13 posts mentioning his name. The Westhampton/Calvander neighborhood talked about Searing most positively with a mean sentiment score of .965, while the MLK Park neighborhood talked about Searing most negatively with a mean sentiment score of -.440. Figure 2 shows a bubble map of Chapel Hill and Carrboro, with the size of each bubble representing the number of posts that mention Searing and the color of each bubble representing the mean sentiment score for those posts.

Figure 2: Bubble Map of Sentiment and Frequency of Posts Mentioning Adam Searing
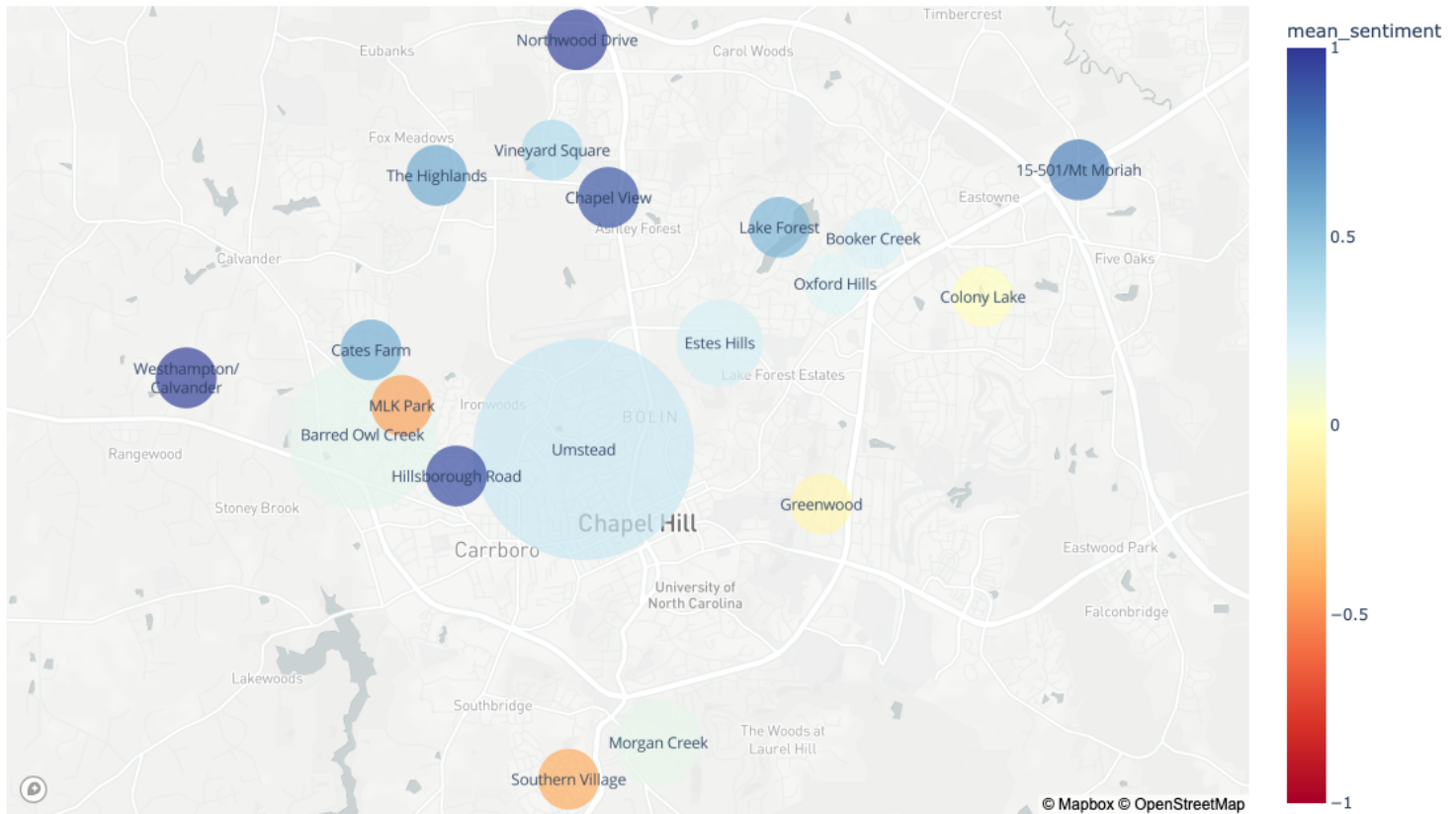
IV.   Discussion

A. Implications

While the sample size is small, my findings suggest that Nextdoor posts can offer clues as to which issues certain people care about at a given moment in time, but those posts and their authors are likely not representative of the true sentiment and makeup of the community. Using this case study as an example, an average Nextdoor user living in Chapel Hill might have gotten

the impression that development of new housing is a serious issue that is harming Chapel Hill and that Adam Searing was the favorite in the November mayoral race because of his stance on rezoning. However, the actual election results show a different picture. Jess Anderson and her platform that supported accelerated development of affordable housing won the election quite handily, as shown by Figure 3 which is a screenshot of the electoral map as displayed on The Daily Tar Heel's website (*Live election results*, 2023). This is despite Anderson being mentioned in the data far less than Searing.

Figure 4 is an overlay of Figure 2 and Figure 3, and it further shows how Nextdoor posts can present an inaccurate portrait of reality. Many authors who talked about Searing positively lived outside the Chapel Hill town limits, either in Carrboro or Durham, and likely couldn't vote in the election. Other neighborhoods in Chapel Hill who voted largely for Anderson were not represented in that subsection of the data and therefore may have created a non-response bias.

Figure 3: Chapel Hill Mayoral Race Election Results

Chapel Hill Mayoral race

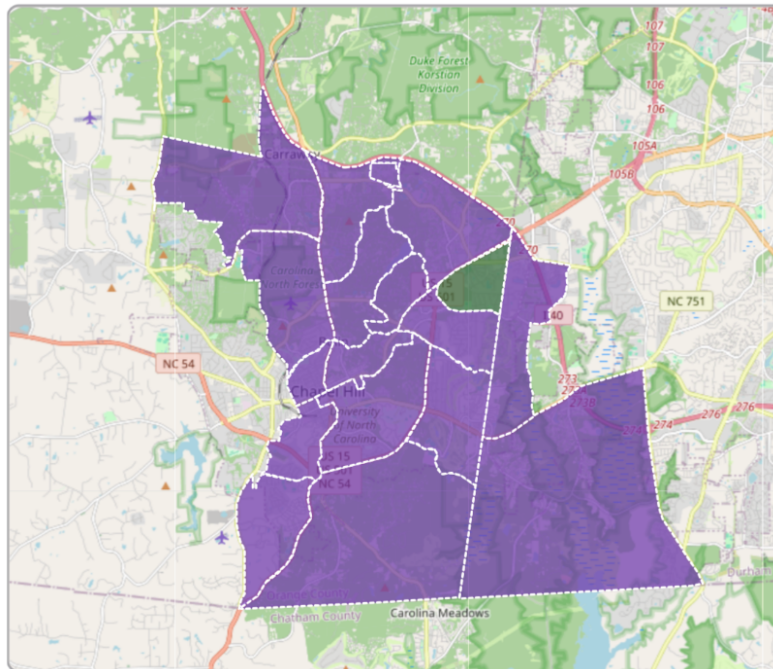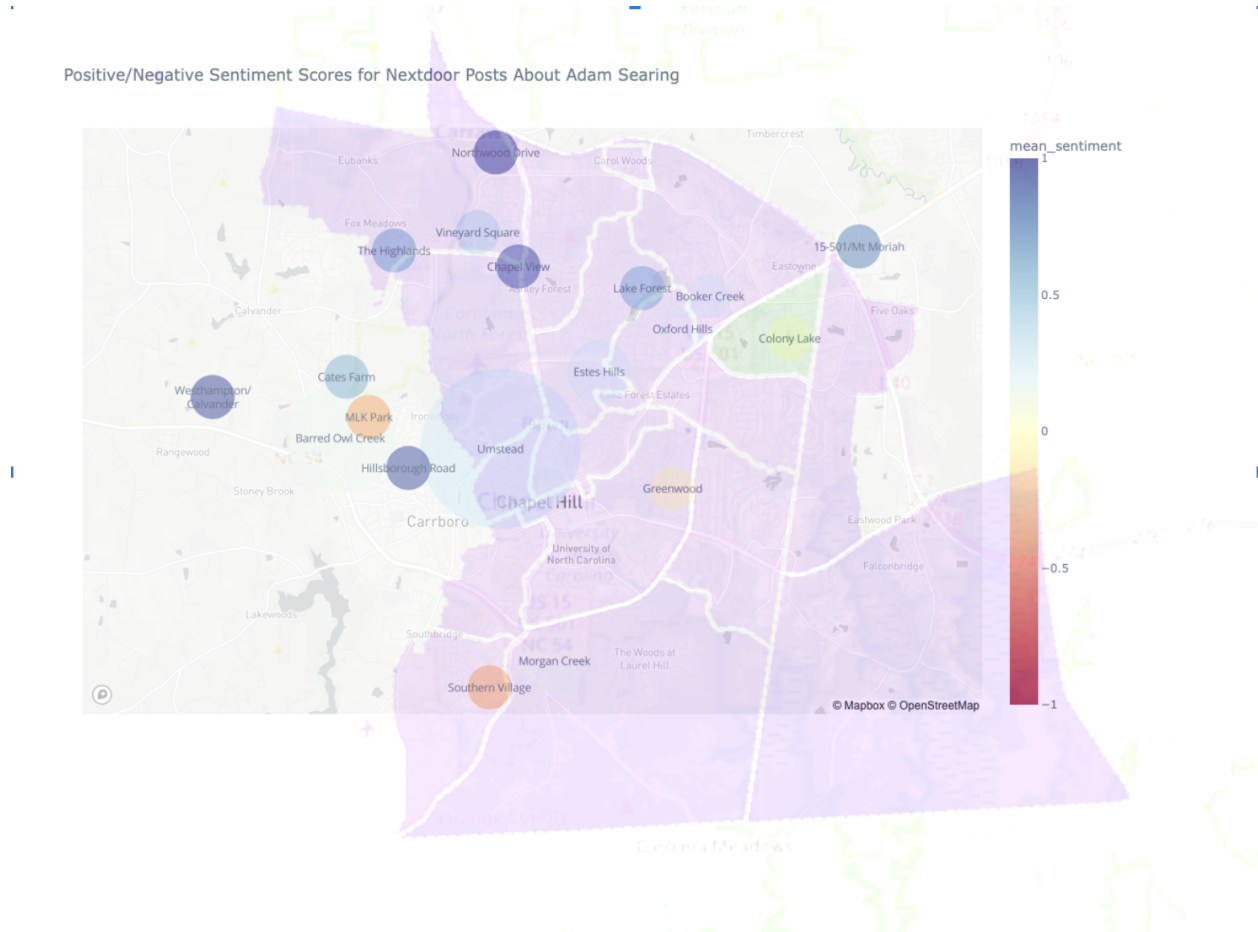| Candidate	Votes	Pct.
▶ Jess Anderson WINNER	7,092	58.8%
● Adam Searing	4,943	41.0%
● Other	29	0.2%

Figure 4: Election Results Overlaid onto Bubble Map

B. Limitations

Of course, the sample size is far too small to produce statistically significant results, and even the data I did retrieve was biased from the way in which I selected it. Therefore, I cannot come to any solid conclusions given my findings. Further research with a larger sample and more randomization would be needed to come to any conclusions about Nextdoor posts and their reflection of a community's true political climate.

C. Ethical Considerations

Given the small sample size and tight-knit nature of the Chapel Hill community, there are questions of privacy that naturally arise when presenting this data. Although the names and neighborhoods of each author in the data is publicly available to Nextdoor users in the Chapel

Hill area, I decided to refrain from using any identifying information in this report, as it doesn't add anything to the reader's understanding of my analysis.

V.   Conclusion

This analysis of Nextdoor posts related to the 2023 Chapel Hill municipal elections sheds light on the potential discrepancies between online discourse and actual community feelings. The findings suggest that Nextdoor posts may not accurately reflect the broader public opinion and underscores the need for caution in interpreting such social platforms as representative of community views.

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