Studying The Effect of Emotional and Moral Language on Information Contagion during the Charlottesville Event

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Abstract

We highlight the contribution of emotional and moral language towards information contagion online. We find that retweet count on Twitter is significantly predicted by the use of negative emotions with negative moral language. We find that a tweet is less likely to be retweeted (hence less engagement and less potential for contagion) when it has emotional language expressed as anger along with a specific type of moral language, known as authority-vice. Conversely, when sadness is expressed with authority-vice, the tweet is more likely to be retweeted. Our findings indicate how emotional and moral language can interact in predicting information contagion.

1 Motivation and Related Work

Previous work surrounding the use of social media for political expression and its role in spreading contagion has focused on studying emotions (Frimer et al., 2019; Boulianne, 2019), as well as the use of moral language (Tappin and McKay, 2019; Mooijman et al., 2018). These findings show that tweets that express extremist sentiments tend to be negative and express anger (Frimer et al., 2019), and that use of moral language could predict the emergence of violence during protests (Mooijman et al., 2018). Furthermore, Brady et al. (2017) studied the interaction between emotion and moral expression for three polarizing political issues, and found that the presence of moral-emotional expression in tweets led to a significant increase in their diffusion. We build upon these findings and focus on understanding the effect of emotional and moral expression on social media during an inherently political crisis event.

2 Data Collection and Analysis

Our context is the Unite the Right rally, held at Charlottesville, USA in August 2017. 19 people were injured and 1 person killed when a protester ran his car through a group of anti-protesters, sparking online and offline social movements. We analyze social media activity on Twitter in the month of August 2017 with a curated set of keywords including cville, antifa, Nazi and neo-Nazi, in a corpus of 500,000 tweets.

We used LIWC (Tausczik and Pennebaker, 2010) and the Moral Foundations dictionary (Graham et al., 2013) to analyze the emotional and moral language expressed in the tweets. LIWC uses lexicons to analyze emotional language including anger, anxiety, sadness and positive emotion (posemo). The Moral Foundations Dictionary works along the same principle, and provides a lexicon to analyze moral language for the categories of vice and virtue, each of which are further subdivided into categories including harm, authority and fairness. Some examples for each of these categories also present in our data are given in Table 1. The potential for overlap between the words in the lexicon and the words to describe the event we are studying could be high. To examine, we show occurrences of the lexicon words by category in Table 1 to showcase their prevalence in our data. We find that while the presence of words such as protest and riot is high (8.77%), there are other categories that are also sufficiently represented in the data (e.g. Harm-Virtue words such as defend, peace occurring 6.75%). We perform moderated regression analysis, with moral and emotion categories as independent variables. We use retweet count as our key dependent variable, since it reflects sharing behavior online, a form of information diffusion (Stieglitz and Dang-Xuan, 2012).
<table>
<thead>
<tr>
<th>Category</th>
<th>Virtue</th>
<th>% of posts</th>
<th>Vice</th>
<th>% of posts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harm</td>
<td>defend, peace, sympathy</td>
<td>6.75%</td>
<td>violence, attack, light</td>
<td>15.39%</td>
</tr>
<tr>
<td>Fairness</td>
<td>equal, rights, justice</td>
<td>1.15%</td>
<td>bigot, bias, segregation</td>
<td>0.79%</td>
</tr>
<tr>
<td>Ingroup</td>
<td>nation, unite, family</td>
<td>10.45%</td>
<td>terrorist, traitor, enemy</td>
<td>3.68%</td>
</tr>
<tr>
<td>Authority</td>
<td>leader, supremacy, father</td>
<td>6.56%</td>
<td>protest, riot, denounce</td>
<td>8.77%</td>
</tr>
<tr>
<td>Purity</td>
<td>church, innocent, decent</td>
<td>0.62%</td>
<td>disgust, sick, ruin</td>
<td>1.32%</td>
</tr>
</tbody>
</table>

Table 1: Top 3 examples of the lexicon words from each category in the Moral Foundations dictionary present in our data, and their prevalence, measured as % of posts which contain words from that category

Figure 1: Interaction plots between retweet count and the usage of anger (left) and sadness (right) with authority-vice

3 Results and Discussion

We hypothesize that the presence of emotion and moral language in tweets would result in a significant effect on the retweet count (Brady et al., 2017). We report significant main effects and interactions of the independent variables and their effect on retweet count. Our multivariate regression analysis resulted in significant regression equation ($F(15, 526082) = 2.507, p < 0.001$) with an residual standard error of 278.9, indicating that each expression of anger contributes to a 0.50133 increase in retweet
count as a main effect, but each expression of anger with authority-vice leads to a 0.81356 decrease in retweet count. The addition of the interaction term to the regression was found to be significant ($F = 6.682, p < 0.001$). Another significant regression equation was found ($F(15, 526082) = 2.838, p < 0.000$) with an residual standard error of 278.9, indicating that each expression of sadness contributes to a 0.73045 decrease in retweet count as a main effect, but each expression of sadness with authority-vice leads to a 2.92685 decrease in retweet count. The addition of the interaction term to the regression was found to be significant ($F = 11.643, p < 0$). These interactions are visualized in Figure 1. Other independent variables including anxiety and positive emotion for emotion and harm, fairness, purity for moral expression used together had no significant interaction effects on retweet count. All coefficients are presented in Figure 2.

**Conclusion and Future Work**

The theoretical implications of these results showcase how the usage of emotion and moral language used together could affect engagement on social media, thereby affecting information contagion and diffusion through message sharing as retweeting. Our findings point towards how the expression of authority-vice (consisting of words such as dissent, rebel, betray etc.) in an emotionally charged environment could both negatively and positively affect message sharing, depending on the emotional context. In both significant interactions, the expression of authority-vice as moral language seems to change the predicting properties of the emotions as main effects. Additional implications of our findings are evident in the study of how content gets shared on social media. Our findings are consistent with the results of Brady et al. (2017), and showcase how moral and emotional expression used together leads to more information diffusion, especially during polarizing events. As part of future work, we will investigate more nuanced means, beyond moderated regressions, to characterize the role of emotional and moral language use on information contagion in more varied contexts.

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**References**


