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Table 1: Principles of Moral Foundations Theory

Category	Virtue	Vice
Protecting versus hurting others	Care	Harm
Cooperation/ trust/ just versus cheating in interaction with objects and people	Fairness	Cheating
In-group commitment (to coalitions, teams, brands) versus leaving a group	Loyalty	Betrayal
Playing by the rules of a hierarchy versus challenging hierarchies	Authority	Subversion
Behavioral immune system versus spontaneous reaction	Purity	Degradation

Highlights of findings:

- In the #BlackLivesMatter corpus, the most prominent values are Care, Harm, Fairness, Loyalty, and Authority.
- In data on #AllLivesMatter, Care, Harm, and Fairness are most salient.
- The #BlueLivesMatter tweets focus on Care, Harm, Loyalty, and Authority.
- In the #WhiteLivesMatter corpus, Harm and Fairness dominate.

How do Moral Values Differ in Tweets on Social Movements?

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ABSTRACT

In this paper, we analyze and compare the representation of social movements on social media from the perspective of morality. Following previous research, which found associations between morality, collective action, and social decision-making, we postulate that moral values are distinct across different movements since these movements represent moral values of those who support or oppose them. The result of our analysis of four movements as represented on Twitter (#BlackLivesMatter, #WhiteLivesMatter, #AllLivesMatter, and #BlueLivesMatter) reveal that #BlueLivesMatter represents values such as Care, Harm, Loyalty, and Authority, while #WhiteLivesMatter features Harm and Fairness. Moreover, we find that Harm is the most prominent moral value in all of our datasets. Our analysis provides a robust understanding of authors' moral stances, which contextualizes the influence of movements on people, and how these movements are perceived in society.

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Table 2: Number of Extracted and Deduplicated Tweets for Each Movement

	May 1st, 2015-May 30, 2017	
	Extracted	Deduplicated
#BlackLivesMatter	675,780	539,186
#BlueLivesMatter	312,887	186,723
#AllLivesMatter	275,627	218,596
#WhiteLivesMatter	30,130	24,666

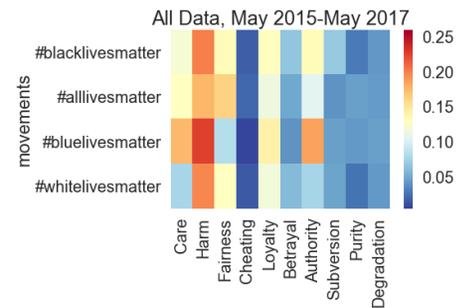


Figure 1: The Overall Distribution of Moral Foundations in Tweets on Social Movements From May 1st, 2015 to May 30, 2017

KEYWORDS

Social Media Analysis; Social Movements; Moral Foundations; Social Computing; Natural Language Processing

INTRODUCTION

Online social networking platforms such as Twitter are social outlets that register people’s reactions to events such as politics, social justice issues, and natural disasters across the globe [1, 11, 21, 22]. Social movements (SM) use social media as a platform to reach out to their audience and provide information about their causes [12, 15]. SM often aim to raise awareness regarding social issues and to engage society in establishing, removing, or modifying policies [17]. Social media platforms provide activists and individuals an opportunity to take (online) actions, and to share, contribute, support, or oppose ideas and ideologies related to these movements. People’s backgrounds and cultures shape their values and stances regarding social and political issues, and these values and stances are represented in people’s language and everyday communication [4, 5, 14, 16]. Sometimes, individuals take sides and discuss their thoughts about movements based on their moral values and ideologies. Moreover, Moral Foundations Theory (MFT) assumes that judgments are based on emotional and cognitive appraisals, referred to as intuitions or foundations [4, 5]. These intuitions can impact people’s decision making because people tend to quickly approve or disapprove specific situations before they apply conscious reasoning [6, 7].

Previous research has addressed the connection between moral foundations and collective action [10, 20]. Van Zomeren (2016) claimed that moral foundations can be associated with collective action intention, and that moral concerns are a kind of personal motivation that along with group-based motivations can predict collective action. Other researchers have affirmed that moral values and judgments are central to social decision-making and cultural cohesion [2, 3, 8, 18]. Based on prior work, we conclude that social movements may represent distinct types of moral values, and that these values can be captured from tweets and online discussions. While we are not able to investigate the causes or triggers of each SM, we believe that knowing the moral values of the participants can help in understanding the ways in which social movements influence society, or fail to do so.

To further study this assumption, we analyze four SM that relate to recent events in the United States: #BlackLivesMatter started in 2013, and was widely recognized in 2014 after the death of two African Americans, Freddie Gray and Michael Brown. After that, other movements were initiated in support of other races and communities, e.g., in support of police officers (#BlueLivesMatter) and all races (#AllLivesMatter). #WhiteLivesMatter was created by white nationalists to oppose #BlackLivesMatter, and uses Twitter to disseminate more racially-biased discussions.

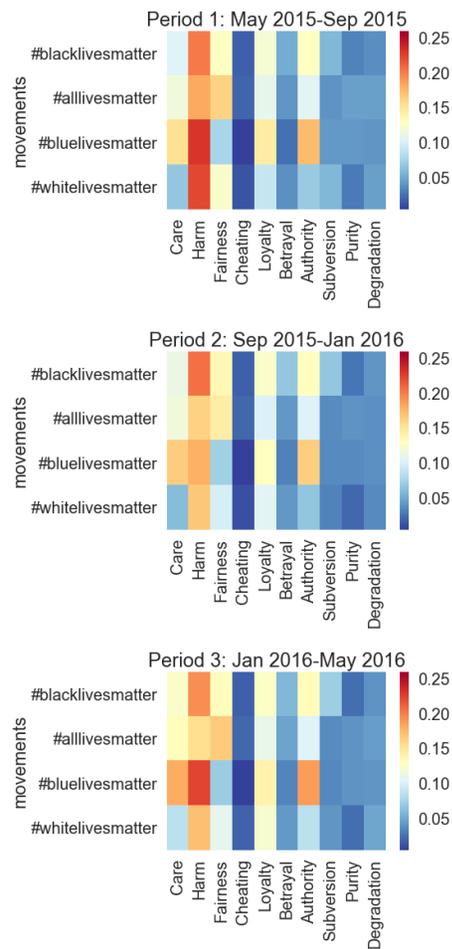


Figure 2: The Distribution of Moral Foundations in Tweets on Social Movements During Periods 1, 2 and 3

¹<https://forsight.crimsonhexagon.com/ch/>

²You may find the tweet IDs of the raw datasets here: https://doi.org/10.13012/B2IDB--9614170_V1.

We extracted tweets related to these SM for a period of two years (05/2015 - 05/2017), and analyzed them for the presence and prevalence of moral values as defined by the MFT. We found that moral values differ across these movements, and that Harm was the most prominent moral value in all of our datasets.

DATA

To collect the tweets related to each movement, we first identified their related hashtags through background research, created individual queries for each SM, and used Crimson Hexagon¹, a social media analytic tool, to retrieve the tweets from May 1st, 2015 to May 30, 2017. We limited the location of tweets to the United States, and focused on extracting the original tweets, i.e., excluded retweets. The first column of Table 2 shows the number of extracted tweets for each SM². After that, we preprocessed the tweets to reduce the noise in the data by removing URLs, mentions, punctuation, and numbers. Moreover, we expanded contracted words (e.g., "I've" to "I have"), lowercased all tokens, and removed duplicated tweets beyond the deduplication that Crimson Hexagon offers. The final number of the tweets considered for analysis is shown in the second column of Table 2.

ANALYZING MORALITY IN TWEETS

Moral Foundations Theory captures people's spontaneous moral reactions and categorizes human behavior into five basic principles that are characterized along a spectrum between opposing ends of values (virtues and vices) as shown in Table 1. The original Moral Foundations Dictionary (MFD) enables the measurement of MFT in texts by associating 324 words with the virtues and vices from the MFT [4, 5]. In this study, we leverage an enhanced version of MFD developed by Rezapour and Diesner [13, 14]. Compared to the original MFD, the enhanced lexicon is less sparse, and consists of 4,636 terms that are syntactically disambiguated, and manually pruned and verified.

To capture morality in tweets, we found and counted all words that matched entries in the enhanced MFD (each box in the last two columns of Table 1). To calculate the overall morality per movement, we averaged each moral category per movement (Figure 1). In addition, we sliced each movement into 6 periods (4 month apart), and recalculated the average morality per period to analyze changes in moral values across time and movement (Figures 2, and 3). The span of 4 months was chosen arbitrarily.

RESULTS AND DISCUSSION

As shown in Figure 1, while the occurrences of some moral categories change across SM and time; the low prevalence of Purity, Cheating, Subversion, Degradation, and Betrayal stays relatively consistent. Looking deeper into time periods 1 to 6 (Figures 2 and 3) shows that in #WhiteLivesMatter, Loyalty increased throughout the time periods. In addition, Betrayal slightly increased in periods 5. One

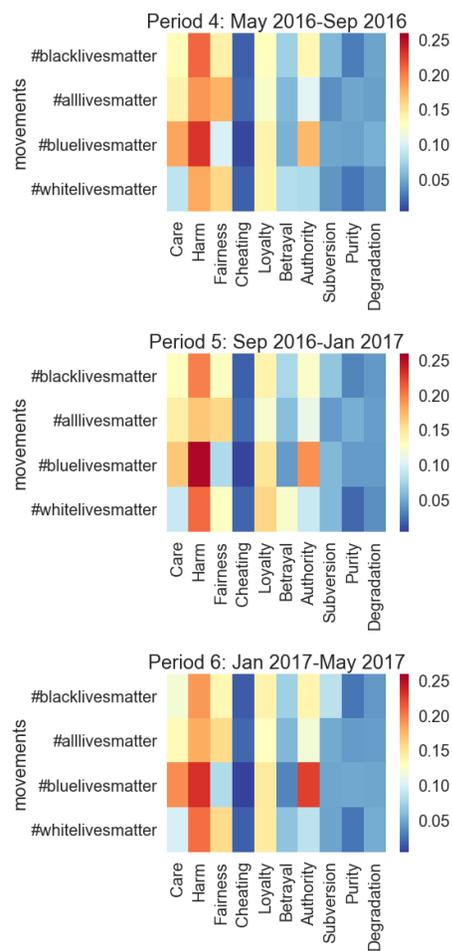


Figure 3: The Distribution of Moral Foundations in Tweets on Social Movements During Periods 4,5 and 6

reason for such behavior can be political and social events, e.g., mass shootings or the 2016 presidential election.

The results in Figure 1 shows that Harm (Care Vice) is the most dominant moral category in our datasets on all four SM. While the average count of Harm fluctuates across the 6 periods, this moral value consistently dominates the set of moral values detected. Care (Virtue) has steady, low-medium presence in the overall analysis of SM (Figure 1). The average count of Fairness varies across movements: in #BlueLivesMatter, we observe the lowest amount of Fairness, while #AllLivesMatter shows the highest average count. Furthermore, we found Authority and Loyalty to have prominent presence in #BlueLivesMatter, followed by #BlackLivesMatter. Our analysis shows that while the considered SM are distinct with respect to moral values that are present in the related tweets, the prevalence of individual moral values remains fairly stable over time per SM.

Moreover, the results in Figures 1, 2, and 3 show that within the corpus of #BlackLivesMatter, Care, Harm, Fairness, Loyalty, and Authority have the highest average counts. #AllLivesMatter, on the other hand, is dominated by Care, Harm, and Fairness. #BlueLivesMatter is focused on Care, Harm, Loyalty, and Authority, and #WhiteLivesMatter features Harm and Fairness most strongly. These findings support our assumption that discussions of different SM on social media represent different types of morality. The theme and mission of a movement, as well as their constituencies and their goals, can be factors that effect how movements are discussed online. Moreover, the evolution and success of SM can change due to factors such as social and political environments, and the rhetorics related to these contexts [9]. Identifying and analyzing moral stances of participants can help in better understanding movements and factors that affect them.

CONCLUSION AND FUTURE WORK

In this work, we analyzed and compared the discourse on social movements on Twitter over the period of two years through the lens of moral foundations theory. Our study is limited in several ways: 1- we did not account for the causes of moral changes in the text-based representation of social movements, 2- we did not compare our findings to a gold standard of morality in these data since there is no benchmark classification available yet. Finally, we did not observe significant differences of salience of moral values per SM when we performed statistical test such as Kruskal-Wallis (1-way ANOVA for non-normally distributed data).

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