

Examining negative online social reaction to police use of force: the George Floyd and Jacob Blake events

Abstract

Dealing with use of excessive force by the police has been a historic struggle in the United States. The 1992 protests in Los Angeles following the death of Rodney King are one example of public response to an instance of excessive use of force. More recently, the death of George Floyd led to widespread protests against excessive use of force and the current model of policing in general. The increasing popularity and availability of social media over the past decade have made it a powerful tool for mobilizing citizens and provided a place for protest. This study looks at the negative reactions of social media users to police use of force in the United States based on analysis of two significant instances: the death of George Floyd in Minneapolis and the shooting of Jacob Blake in Kenosha. Using quantitative, forensic linguistics, and advanced topic modeling methodologies, three prominent aspects of policing identified in the literature – excessive use of force, racial bias, and legitimacy – were analyzed in 14 days of tweets following each event. Analyses deal with trends in frequency, case similarities, and topic modeling. The results show important differences in negative online reaction to the two events, particularly regarding excessive use of force: those following the Floyd death focused on the technicalities of the intervention, while those responding to the Blake death focused on its aftermath. Analysis of tweets related to racial bias and police legitimacy revealed similar patterns, with users repeating criticisms such as differential treatment according to race and the need for changes in the policing model. The results also suggest that perceptions of excessive use of force and racial bias are deeply intertwined. Implications and issues are discussed.

Keywords: *use of force, online media reaction, topic modeling, social media, Twitter*

Introduction

Police officers are almost the only people who have a legal right to use force in their day-to-day work (Bittner, 1970). Many authors have looked at the use of force by police officers, often focusing on how this right is seen by the general public (Jefferis et al., 2011). How use of force is perceived depends on a wide variety of factors (Alpert & Dunham, 2004) and understanding it is complicated by both the multiple factors associated with it and the diversity of methods available to communicate opinions and perceptions, particularly online social media. Capturing police actions on film can be seen as one way to denounce use of force, with "viral accountability" serving as a way to hold abusive police officers accountable without going through the justice system (Miller, 2016). In this study, relevant trends in how the use of force by police officers is perceived are examined in Twitter messages following two major events – police actions that led to the death of George Floyd and to the paralysis of Jacob Blake. Using topic modeling methodology, this study proposes an innovative approach to examining trending narratives, focusing on two important events that have both micro and macro-level implications for the field.

Studies on the Perceived Use of Force by Police

In an attempt to measure perceived use of force by police, Jefferis et al. (2011) asked participants from the general population to rate police interventions according to five different use-of-force models. They found that Alpert and Duham's force factor model, based on the idea that actions between citizens and police officers are both asymmetrical in terms of authority and interactive, evolving towards either violence or calm, was the most effective at assessing the use of force phenomenon as a whole (Alpert & Dunham, 2004). They also found that support for the police in general is linked to support for their use of force (Jefferis et al., 2011). Simon et al. (2021) found that being a member of a visible minority significantly

increased the likelihood of perceiving police action as an abuse of force while media coverage of events in which police are alleged to have abused their position often led to public demands for reform (Weitzer, 2002).

Several studies have analyzed media bias in reporting police events. Stereotypical interpretations, such as good cop, bad cop (see Lovell, 2003) or the dichotomous simplification of police into heroes or villains (see Flanagan & Vaughn, 1995), have been studied, as have reality TV shows, which tend to present a more positive view of the police (Eschholz, Blackwell, Gertz, & Chiricos, 2002). The extent and use of sensationalist and highly emotive terms to describe police activity (i.e., police brutality) have been investigated (Lawrence, 2000) and there has been discussion of the discrepancy between the number of cases of excessive force discussed in the media and the number of cases found after investigation for almost 20 years. Some studies report that the vast majority of cases of excessive force are found to be "reasonable, legal and appropriate" after investigation, with the remainder constituting 0.36% of all events involving the use of force (Henriquez & Barrett, 2001; Montgomery, 2005). It is important to avoid hasty generalizations about police use of force but equally important to take into account the underlying issues highlighted in the present study.

Studies show that ethnicity is a significant predictor of perceptions of the police in the United States (Weitzer & Tuch, 1999). A study conducted by Simon et al. (2021) showed that perception of racial bias by visible minorities was related to the number of non-minority residents living in the same neighborhood (Simon et al., 2021). In another study, respondents of different ethnicities reported that the police treat those who are black more severely than those who are white, with 81.9% of black respondents agreeing with the idea that police are racial biased (Wortley et al., 2021). Black men in the United States report feeling that the police stereotype them as criminals (Camargo et al., 201; Najdowski et al., 2015). Perception of the police as racially biased has been found to be influenced by ethnicity, personal experiences with police, and media reports of police activities involving racial bias (Weitzer & Tuch, 2005). Sigelman et al. (1997), in a study of police brutality and perceived

racial bias, found that media reports of police abuse of power educate whites about the phenomenon of racial bias in policing but do not lead them to conclude that racism is pervasive in the American justice system.

It has been suggested that the media often portrays police officers negatively, leading to decreased perception of police legitimacy (Choi, 2018; Graziano & Gauthier, 2018). Tankebe (2013) used four sociological concepts – procedural correctness, service correctness, legality of intervention, and police effectiveness – to measure the population’s perception of police legitimacy and its relationship to cooperation with the police. His results support the hypothesis that these four themes adequately measure perception of police legitimacy and suggest that belief in the legality of police actions and in the fairness of procedures were the most influential factors in determining cooperation with police (Tankebe, 2013). Satisfaction with the police is affected by personal experiences with the police as well as reports of police interactions with others, especially in cases in which the police have initiated the encounter (Farmer & Sun, 2016; Reisig & Chandek, 2001; Rosenbaum et al., 2005; Skogan, 2005). Levels of approval or disapproval of particular police actions are often correlated with reported levels of satisfaction with the police in general, while belief in the fairness of particular actions increases a sense of police legitimacy (Hinds, 2008; Tyler, 1990). Negative feedback related to particular actions may help explain the low rate of trust in police in the United States, where more than half of the population (57%) reported a lack of trust in law enforcement agencies (Norman, 2017).

For over a decade, widespread use of social media has made it a powerful tool for citizen mobilization (Passini, 2012) and a public place for protest (Hayes, 2017). Several studies have used social media as a barometer of public opinion regarding perceptions of security (Camargo et al., 2016), immigration (Flores Morales & Farago, 2021), and policing (Adepeju & Jimoh, 2021). Online content may also affect perceptions of the police (Sodhi et al., 2020). In a study of the key themes in social media posts dealing with local or national incidents of police conflicts in communities of color in Chicago, the authors looked at 84,740

posts, mainly on Instagram but also on Twitter, YouTube, and Flickr. Results showed high levels of negative responses toward law enforcement related to law enforcement activity in posters' neighborhoods as well as in posts dealing with criminal activity, immigration, political protests against police, African American men and law enforcement, sympathy with the Sandra Bland case, and #Blacklivesmatter. The authors also note that the need to protest police actions and attitudes was a common theme in the social media posts examined and suggest that minorities in Chicago use social media to express anger with the police as well as to call attention to dehumanizing interactions with law enforcement. These results are consistent with those of a study that examined posts on Facebook after the death of George Floyd to evaluate how different reactions to the Black Lives Matter movement were related to gender and ethnicity. George Floyd's death was seen as indicative of "a longstanding pattern of injustice that takes an emotional toll, and as an egregious exemplification of racism that calls for indictment of the status quo." (Dixon & Dundes, 2020)

Current Study

Few studies have used Twitter as a social barometer to assess views on the use of force. While previous studies have traditionally been focused on opinions about the use of force, social media make it possible to undertake a quantitative and qualitative analysis of the more important issues expressed by the general population, highlighting topics that inform the understanding of the social impact of use of force interventions. The current study is unique in that it considers multiple approaches (i.e., machine learning techniques, criminology theories, social media analysis, data mining) to identifying criticism directed at police. The contemporary problems this criticism reveals are analyzed using new methods, developed following a review of the literature on criticism of the police, and use topic modeling based on natural language processing to compare negative online reactions to two use-of-force events.

Method

Data

This study examined Twitter messages related to two highly mediatized events: the Minneapolis police intervention that led to the death of George Floyd on May 25, 2020, and the Kenosha police response that led to the paralysis of Jacob Blake on August 23, 2020. Twitter was chosen for our study as it provides useful access to application programming interfaces (APIs). It is also one of the most popular social networks, with 73 million users in the US (Statista, 2021), making it possible to access numerous negative reactions to the two events under study. Looking at two events allowed us to analyze quantitative and qualitative differences in the reactions of the Twitter community. To collect the messages in our sample, Twitter Application Programming Interface (API), a free tool that makes possible to extract Twitter messages as useable data, was used to search for tweets published within 14 days of the event (Minneapolis, May 25, 2020 – June 07, 2020; Kenosha, August 23, 2020 – September 4, 2020) and that mentioned the police organization involved with the event (@KenoshaPolice or @MinneapolisPD). A 14-day period for data collection was chosen because, while the events continued to generate negative reactions for some time, this period allowed capture of a representative sample of negative reactions.

Police department usernames were used to increase identification of reactions directed to the police organizations involved in these events: Twitter users had to have deliberately chosen to include the police handle, indicating that the message was intended to be noticed by the police or sent to their official accounts. In total, 164,479 of the extracted tweets dealt with the George Floyd event and 298,050 tweets with the Jacob Blake event (a total of 462,529 tweets).

Procedure

Using Python libraries¹, content was standardized by removing unwanted characters such as emoticons and URL addresses, retaining only the messages for analysis. Data were imported in QDA Miner 6.0 to help qualitative content analysis.

¹ Pandas : <https://pandas.pydata.org/>

Nltk : <https://www.nltk.org/>

Os : <https://docs.python.org/3/library/os.html>

Json : <https://docs.python.org/3/library/json.html>

A second step consisted of classifying the tweets into preliminary and non-mutually exclusive themes related to criticisms of police. Three themes identified from the literature on police use of force – excessive use of force, racial bias, and legitimacy – were retained for the current study as their clear conceptualizations helped classify the tweets. They are also the areas most frequently discussed in the news media (Pollack and Allern, 2014) and cover the broad spectrum of negative attitudes toward police in the United States. Tweets were then grouped into these themes using the following systematic approach: a list of the most frequent words was generated by QDA Miner software, a series of these words associated with each theme was identified, and these words (keywords) were used to generate classification of all tweets into the three themes. For the Floyd event, 24 keywords were used for the theme *excessive use of force* (e.g., choked, death, force, died), 13 keywords for *racial bias* (e.g., black, white, race, racial), and 46 keywords for *legitimacy* (e.g., training, reform, change, accountability). For the Blake event, 29 keywords were used to refer to the theme *excessive use of force*, 20 to *racial bias*, and 36 to *legitimacy*. Details on the keywords and their frequency are found in the Supplemental Material. All tweets unrelated to any of the three themes were automatically classified into a *miscellaneous* theme, which was analyzed briefly for content.

Analyses

Quantitative analyses were conducted using Word-Stat, a software tool integrated with QDA Miner. Word-Stat analyses textual content using machine learning techniques and extracts important themes (Provalis Research, 2020). Descriptive analyses were conducted on all themes to obtain an overall picture (e.g., percentage of tweets per themes) of each event. Comparison analyses between themes were then conducted using co-occurrence frequency and Jaccard's coefficient. Because theme categories were not mutually exclusive, co-occurrence frequency helped identify the keywords most frequently associated with a given theme, while

Jaccard's coefficient helped determine the level of similarity between keywords and themes. This approach facilitates understanding how the categories of police criticism coevolved, with 0 interpreted as no association and 1 as perfect association (Provalis Research, 2020). A topic analysis was then performed using factor analysis and natural language processing for each theme and both events. Topics are useful for exploring large bodies of data (Ramage, 2009) and make it possible to associate specific discussions of each event with recurring themes of criticisms against the police, in this case, use of force, racial bias, and legitimacy. Ten topics were extracted for each of the three themes. Topics are generated in terms of clusters of words (Zhao et al., 2015): if the software is asked to present 10 topics for a theme, the 10 clusters that are identified as the most coherent are generated as topics but distribution among the topics is not necessarily equal. We chose to use only non-redundant topics, which left 13 unique topics for analysis. WordStat generates titles based on the most common element among words in a particular cluster. As naming a topic is difficult for both humans and computers (Ramage et al., 2009), the names generated by the software were kept. Not changing the titles also respects the integrity of the topics created by the software through machine learning.

Results

Descriptive Analyses

As can be seen in Table 1, *excessive use of force* was the most frequently discussed topic after the Floyd event, with 67,004 tweets (40.7%) classified under this theme. A total of 49,583 (30.1%) tweets dealt with *racial bias* and 36,897 (22.4%) with police *legitimacy*. *Excessive use of force* was also the most frequently classified topic after the Blake event, with 179,504 tweets (60.2%) on that theme. A total of 97,837 tweets (32.8%) were classified under *racial bias* while 119,714 (40.2%) tweets were classified under police *legitimacy*. The remaining tweets ($n = 78,083$; 26.2%) were automatically classified under the *miscellaneous* theme, which contained mainly irrelevant media announcements (e.g., "JUST IN: @MinneapolisPD identify 4 officers fired in #GeorgeFloyd

arrest:officer Derek Chauvin Officer Thomas Lane Officer Tou Thao Officer J Alexander Kueng").

[Insert Table 1 Here]

Comparative Analyses

Themes were compared to assess the level of similarities in tweet content. As can be seen in Table 2, for the Floyd event, Jaccard's coefficient revealed similarities between the themes of *excessive use of force* and *racial bias*, with a score of .45, meaning that slightly fewer than 50% of the tweets were shared between these themes. A total of 35,931 tweets contained both themes. The *excessive use of force* and *legitimacy* themes had a Jaccard's coefficient score of .23, corresponding to a small percentage of shared tweets, with a total of 19,114 tweets related to both themes, while the *racial bias* and *legitimacy* themes had a score of .12, with 9,350 tweets related to both themes. This last coefficient means that a low proportion of tweets shared both themes. In the Blake event, the *excessive use of force* and *racial bias* themes had a score of .42, corresponding to a high number of shared tweets, for a total of 81,921 common tweets. The *excessive use of force* and *legitimacy* themes had a score of .48, which is considered high, with 96,739 tweets in common, and *racial bias* and *legitimacy* themes had a score of .33, with 53,910 common tweets.

[Insert Table 2 Here]

A temporal analysis was also performed to examine changes in negative reactions over the 14-day period. With both events there was a general downward trend in the number of tweets discussing excessive use of force by police, racial bias, and police legitimacy.

Factor Analyses

Excessive use of force. As can be seen in Table 3, 5 topics were extracted from the factor analysis of the *excessive use of force* theme, three related to the Floyd event and two to the Blake

event. The first topic relates to *neck restraints*², where users discussed the techniques used in the arrest. The use of choking techniques by police was discussed in 1,350 tweets (consistency = .938; the consistency index captures how similar tweets in each topic are). One of the widely relayed tweets on the topic discussed the number of other police interventions that had involved the neck restraint technique that led to Floyd's death.

The second topic relates to *broad daylight video*, where users discussed the context in which force was used in 58,036 tweets (consistency = .968). The discussion here revolved around the fact that the intervention was filmed by a passerby. Twitter users also discussed that the intervention was carried out in broad daylight, in front of several bystanders. Users were surprised that a police officer would use excessive force even though he knew he was being filmed in front of witnesses.

The third topic relates to *pepper spray* where 2,982 tweets (consistency = .881) mentioned the excessive use of force during the protests that followed Floyd's death. Many users complained about the actions used by Minneapolis police against the protesters. For example, some noted the heavy use of pepper spray in situations where this exacerbated tensions.

The fourth topic relates to *hospital bed*, where Blake's injuries resulting from the police intervention were discussed in 18,015 tweets (consistency = .958). Users expressed outrage that Blake was paralyzed and lying in a hospital bed and, more important, that he was handcuffed to the bed despite his paralysis.

The fifth topic relates to *traumatized kids* in the context of the police intervention. This topic was discussed in 90,576 tweets (consistency = .999) and dealt with the fact that Blake was allegedly attempting to settle a dispute between two women. The tweets also noted that children were at the scene where police fired seven shots. A tweet shared several times mentions that the children will be forever traumatized by this intervention.

² The titles of each topic were automatically generated by WordStat during theme creation. The titles are based on the common element shared by the tweets together.

[Insert Table 3 Here]

Racial Bias. As can be seen in Table 4, 4 topics were extracted from the factor analysis of the *racial bias* theme, three related to the Floyd event, and one to the Blake event. The first topic deals with the *white power link to Minneapolis PD*. In 8,842 tweets (consistency = .991), connections were made between Minneapolis police and far-right groups.

The second topic relates to *similarly white choked*, where in 17,307 tweets (consistency = .855) users mentioned the differential treatment of black and white suspects by Minneapolis police.

The third topic relates to *Caucasian community policing*, with 19,106 tweets (consistency = .995) referring to the Minneapolis Police Department's long history of dealings with black people. In contrast to the previous topic, there was more political/historical discussion in the "Caucasian community policing" topic. That last topic is also more reflective of statistics. For instance, Twitter users mentioned an event in 2015 during which a black man, Jamar Clark, was handcuffed by police officers even though he was dead. They also mentioned that money budgeted for community policing programs in Minneapolis PD is instead being used to target black people.

The fourth topic relates to *apolitical right wing*. For the Blake event, only one subject explicitly dealt with racial bias in policing: in 135,860 tweets (consistency = .986), users discussed the Kenosha police's preferential treatment of those who are white or in far-right groups over those who are black.

[Insert Table 4 Here]

Legitimacy. As can be seen in Table 5, 4 topics were extracted from the factor analysis of the *legitimacy* theme, three related to the Floyd event and one related to the Blake event. The first topic relates to *held accountable*, with 46,323 tweets (consistency = .878) in which users called for the police to be held more accountable for their actions. For example, some users suggested that the pensions of the police officers involved should be suspended.

The second topic relates to *prioritize community*, where in 46,323 tweets (consistency = .878) users called for a change in the police model to begin to prioritize vulnerable communities. There was also a call for changes in certain practices in police institutions.

The third topic relates to *sanctioned serial killers*, with 2,108 tweets (consistency = .882) expressing disdain for the Minneapolis Police Department, calling them serial killers protected by the state.

The fourth topic relates to *defunding the police and its reform*. In 6,973 tweets (consistency = .835), users called for change following the Blake event. These requests for change were oriented around a decrease in police funding and indicated dissatisfaction that police reforms have been proposed for several years in the United States but have never occurred.

[Insert Table 5 Here]

Discussion

This study used advanced topic modeling analysis to examine how Twitter users perceived use of force by police following two events in the United States. Three main themes related to police use of force were identified in the literature – excessive use of force, racial bias, and police legitimacy. All Twitter messages dealing with the Floyd and the Blake events during the 14 days following the events that referenced the police departments involved by including @KenoshaPolice or @MinneapolisPD were classified and comparative and factor analyses conducted. Overall, results showed that the most frequent themes identified for both events relate to the excessive use of force. Results also showed a general downward trend in the number of tweets for all three themes. Factor analyses of the message content of all themes revealed unique subthemes, providing more detail about the public perceptions of police intervention in both events.

The Perceived Excessive Use of Force by Police

The use of force was the most discussed topic. Assessing perceived use of force by police officers is a complex process, previously analyzed as an interaction between the level of

resistance and the force applied (Alpert & Dunham, 2004). The present study identified specific factors of applied force associated with public perceptions of police use of force. For the Floyd event, Twitter users were concerned with the technical aspects of the intervention and many suggested that the use of restraint and knee-to-neck techniques should be illegal. For the Blake event, Twitter users described the consequences of police intervention, such as children witnessing violence. Taken together, these results suggest that Twitter users may be less concerned with accurately evaluating police interventions and more concerned with perceived injustices related to the techniques and consequences of the applied force. A significant number of reactions to excessive force and racism in policing were also found. Research has shown that negative reactions related to these two themes often intersect, with one influencing the other (Mapping Police Violence, 2018; Dixon & Dundes, 2020; Weitzer, 2002). Topic analysis showed differences in public perception of excessive use of force in these events: following the death of George Floyd, Twitter users were more likely to post about the poor technique used during the intervention, whereas posts following Blake's injuries were more likely to deal with the consequences of the intervention.

The Perceived Racial Bias of Police

Individuals who listen to news media are more likely to believe that the police are racially biased (Weitzer & Tuch, 2005). The present results support this, with 147,220 tweets denouncing racial bias in police interventions. Twitter users discussed police officers' preferential attitude toward those who are white, emphasizing the differences in the treatment of black and white individuals. This result is in line with previous literature, where the same perceptions of racial bias in police interventions have been found (Weitzer & Tuch, 1999; 2005). For both events, specific references linking the far right and police in the United States were also observed. This last link is seldom mentioned in the literature about racial bias in the police so further investigation using other analytical methods is needed. Results from factor analysis showed that the topics identified within the theme of racial bias were similar for both

events. This suggests that online users may use similar arguments about racial bias in police interventions for a variety of events.

The Perceived Illegitimacy of the Police

The legitimacy of the police is a broad concept (Tankebe, 2013; Tyler, 1990). Results from this study, particularly the similarity coefficients between legitimacy and excessive use of force themes, showed that Twitter users who perceive specific police interventions as unacceptable also tend to believe that the police are not a legitimate organization, supporting observations made by Tankebe (2013) and Tyler (1990). For the Blake event, for example, excessive use of force and legitimacy – specifically procedural fairness and the legality of police actions – were often discussed together. For both events, Twitter users questioned the legitimacy of the current police model and asked for changes such as a decrease in police funding or more community-oriented policing. For the Floyd event, the focus was also on police responsibilities, such as protecting citizens, that seemed to be inconsistent with their actions in this case. Claims that systematic injustice is a long-standing issues were found for both events. These results are in line with the findings of Dixon and Dundes (2020) that those who denounce current actions also denounce patterns of historical injustice. The Twitter users in the present study deplored the fact that nothing has changed despite multiple instances of injustice. Results from the topic analysis show similar responses for both events in terms of public perception of police legitimacy, for example, links between the extreme right and the police and demands for police defunding.

Summary of Topics in Negative Online Reactions

Topic modeling makes it possible to identify general trends in the negative social reaction to the Blake and Floyd events. Table 6 classifies topics in terms of the areas affected and whether they dealt with the event directly or with its collateral effects. Reactions dealing with the characteristics of the events were extremely negative, with one trend in the Floyd case clearly identifying police as killers that need to be sanctioned. In the Blake event, the aftermath effects were more prevalent (hospital bed and traumatised kids). At a macro level,

the general meaning of both events was related to race – many users saw these events as representative of a general pattern in which the black community is targeted by police. This is particularly apparent in Twitter responses to the Blake event, perhaps because it took place shortly after the Floyd event and may reflect a cumulative effect. The topic modeling also identified important trends in collateral events, such as technical aspects (neck restraints for Floyd). The broad daylight theme may have been prevalent in the tweets about the Floyd event because it captures the idea that the officers were not hiding or upset about being filmed, suggesting that they felt their actions could be understood as a normal intervention. A more general aspect revealed by topic modeling was the need for police reform, which was discussed in an important number of tweets that advocated defunding the police, a topic that goes beyond the scope of the two events discussed here.

[Insert Table 6 Here]

Public Perception of Police Actions

While traditional media's bias in reporting police events has been well documented, the effect on public attitudes toward crime and the criminal justice system is both important (Jefferis et al., 2011) and under-investigated, especially in the case of violent events, which continue to affect public perceptions of the police (Weitzer, 2002). The effect may have been even more important for the events studied here as they were not only widely discussed in the traditional media but were available on the Internet. Studies have shown that the opinions people have about the police are affected by a negative experience with an officer (see Farmer & Sun, 2016; Rosenbaum et al., 2005). Witnessing such an event involving another individual, when captured with the immediacy provided by video and expanding the chorus of spectators (Toch, 2012), may trigger similar effects.

By identifying trends in the negative comments of Twitter users about the use of force by the police, this study provides an important opportunity to consider future police policies. Events such as those discussed in this study have an important effect on the ability of police to carry out

their work as they diminish the acceptance and positive support which effective policing requires (Schafer & al., 2003). Information on how such events are perceived should aid policymakers in developing guidelines and programs that increase confidence in the police and in the legitimacy of their use of force. Additional efforts are needed to restore public confidence in the police, particularly among the racialized groups frequently affected by such events.

Limitations

While analyzing Twitter responses to particular events is an innovative approach to understanding public opinion, this study has its limits. First, the database was limited to tweets addressed to the agencies involved (@MinneapolisPD or @KenoshaPD) to allow us to focus on police use of force and racial bias as well as ideas regarding legitimacy. Second, while the Floyd event resulted in worldwide demonstrations and could be expected to produce more activity on Twitter than the Blake event, the Floyd sample included fewer tweets. This was due to two aspects of the methodology. First, to ensure that the tweets in the sample were related to the police departments that dealt with the events, only tweets that included the Twitter handles for the Minneapolis and Kenosha police departments were included, excluding tweets about protests in other cities or on related topics that did not involve these departments. Second, this may have occurred because Twitter makes available only a portion of all tweets sent at a given time. This restriction does not affect the validity of the study because the results were constantly collected during the 14-day data collection. Third, only negative perceptions of the police were considered in our analysis, which may have limited the scope of perceptions of the police available for study. Fourth, it is important to note that Twitter users may not be representative of the general population, nor is Twitter necessarily representative of all social media platforms (see Matamoros-Fernández & Farkas, 2021). Finally, the use of bots to amplify the attention paid to these issues and the number of tweets related to them cannot be ruled out (McKelvey and Dubois, 2017). While an overview of the number of tweets for accounts in the sample did not reveal any pattern that would suggest this

was the case, it is important to remember that use of bots is becoming increasingly sophisticated and more difficult to detect.

Conclusion

This study shows that advanced qualitative and quantitative analysis methods, such as factor analysis, can be used to capture perceptions of the police as expressed on Twitter. These advanced techniques make it possible to identify specific themes and the tweets related to them, illustrating general trends in messages on Twitter. The results of such analyses for two events involving excessive use of force show that Twitter participants are likely to focus on specific examples of injustice. In the Floyd event, this injustice was related to the restraint technique that resulted in Floyd's death. In the Blake event, the focus was on the consequences of the intervention: children witnessing violence and an individual handcuffed to a bed while paralyzed.

As Walsh and Connor (2019) have argued, more empirical studies are needed on how social media affect the policing landscape. Further research should also focus on providing a better understanding of the influence of social media as well as how they may be vectors of change in society.

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Table 1.
Frequency of tweets by themes

	Floyd		Blake	
	N	Cases (%)	N	Cases (%)
Excessive use of force	67,004	40.7	179,504	60,2
Racial bias	49,583	30.1	97,837	32,8
Legitimacy	36,897	22.4	119,714	40,2
Other	63,560	38.6	78,083	26,2

Table 2.
Similarities between themes

	Floyd event		
	Excessive use of force	Racial bias	Legitimacy
Excessive use of force	1 (n = 67,004)		
Racial bias	.445 (n = 35,931)	1 (n = 49,583)	
Legitimacy	.225 (n = 19,114)	.121 (n = 9,350)	1 (n = 36,897)
	Blake event		
	Excessive use of force	Racial bias	Legitimacy
Excessive use of force	1 (n = 179,504)		
Racial bias	.419 (n = 81,921)	1 (n = 97,837)	
Legitimacy	.478 (n = 96,739)	.329 (n = 53,910)	1 (n = 11,9714)

Table 3.
Topics in the excessive use of force theme

Topics	Examples	Consistency	N	Case (%)
The Floyd event				
Broad daylight video	1 - "Y'all can arrest a black CNN reporter and his cameraman for no apparent reason but can't arrest a one of your own who killed a man on video in broad daylight @MinneapolisPD???"	.968	5,8036	35.28
	2 - "@[user] @[user] @[user] @[user] @MinneapolisPD Yup it's a part of the union agreement but that doesn't make it any less shitty. And yeah he deserves his day in court and I hope he gets it without the blue wall protection. This video shows the officer killed him plain and simple. Lock him up! #JusticeForFloyd #PoliceBrutality"			
Neck restraints	1 - "Three of my @[user_media] colleagues — @[user], @[user], and @[user]— analyzed @MinneapolisPD records. ""Since the beginning of 2015, officers from the Minneapolis Police Department have rendered people unconscious with neck restraints 44 times."" [url]"	.938	1,350	.82
	2 - " Tentative agreement would ban chokeholds neck restraints by @MinneapolisPD & the ?? WORLD replies with YOU think so? Apply YOUR EyeRoll GIF to the smarties who make protocol decisions at @CityMinneapolis ?? Did it take @[user] for @[user]to come up w/this Declaration? [url]"			
Pepper Spray	1 - "If you thought the Minneapolis PD's murder patrols couldn't get worse, they could. Today they conducted a drive-by assault on #BlackLivesMatter protesters with pepper spray. Call 612-348-2345 and tell @MinneapolisPD to STOP violating civil rights. [url]"	.881	2,982	1.81
	2 - "Stop murdering colored people. Stop tear-gassing and pepper spraying bystanders during a respiratory pandemic. Stop arresting journalists. Stop lying about			

everything. Thank you @MinneapolisPD
#EndPoliceBrutality [url]"

The Blake event

1 - " Confirmed: Jacob Blake's 3 SONS were
IN THE CAR he was getting into when
@KenoshaPolice shot him tonight. They saw
a cop shoot their father. They will be
traumatized forever. We cannot let officers
violate their duty to PROTECT us. Our kids
deserve better!! #JusticeForJacobBlake"

Traumatized
Kids

2 - "@[user] @[user] @[user] @[user]
@[user] @[user] @KenoshaPolice I
understand the laws of the country I live in.
Fleeing or resisting arrest, even if thats what
he did, does not carry a death sentence.
Now let me guess what's next, you think he
was going to pull a gun out of his car and get
into a point blank shootout with his kids in
the car "

.999 90,576 30.39

Hospital
bed

1 - " Jacob Blake has not been charged with
any crime. Jacob Blake's family has not been
told of any charges. Jacob Blake is paralyzed.
Jacob Blake is handcuffed to his hospital
bed. The @KenoshaPolice are terrifying."
2 - "@KenoshaPolice Why is Jacob Blake, a
man who you shot, a man who is
paralyzed, handcuffed to his hospital bed?
Answer for this now. [url]"

.958 18,015 6.04

Table 4.
Topics in the racial bias theme

Topics	Examples	Consistency	N	Case (%)
	The Floyd event			
Caucasian community policing	<p>1 - "The @MinneapolisPD has received \$6.4 million in taxpayer dollars from the Justice Department's Community Oriented Policing Services program, yet Black People are killed by MPD officers at 13.2 times the rate of Caucasians. #GeorgeFloyd"</p> <p>2 - "Yesterday's tragedy is hardly the first instance of @MinneapolisPD killing black people and sparking outrage. In 2015, MPD shot Jamar Clark, a black man who was handcuffed at the time of his death. Protesters responded by occupying a police precinct: [url] [url]"</p>	.995	19.106	11,.2
White power link Minneapolis PD	<p>1 - "Minneapolis police leader defending #GeorgeFloyd's killers tied to 'white power'-linked biker gang and long string of racist incidents From our archives, a detailed account by @[user]of the systemic racism permeating the ranks of the @MinneapolisPD [url] "</p> <p>2 - " Typical racism mentality, start a war on your own citizens and still won't lock up the 3 additional murderers how axx backwards, this is the example weak axx white power @USAttorneys @MinneapolisPD #GeorgeFloydMurder #GeorgeFloyd #GeorgeFloydProtests"</p>	.991	8,842	5.38
Similarly white choked	<p>1 - "Dear Minneapolis Police Department You choked Mr. George Floyd to death. What have you @MinneapolisPD gained from this? Is this what white USA policemen are trained to do? Are whites arrested similarly? SHAME ON YOU. ?????? #ICantBreathe #JusticeForGeorge #BlackLivesMatters [url]"</p> <p>2 - @[user] George Floyd was lynched, courtesy of (I assume) @MinneapolisPD. Lynching is, of course, a venerable American tradition. In its modern form it seems to require a gang of fat white cops,</p>	.855	17.307	10.52

but still revolves around torturing an unarmed black man to death, in public."

The Blake event

Apolitical right wing	1 - "With the video of @KenoshaPolice giving water to and thanking the white nationalist militia groups including the murderer of two protestors, it should be clear that the police in this country are NOT apolitical but adhere to right-wing ideology and view WS militias as allies" 2 - "A member of the white supremacist #BoogalooBoys shot multiple protestors in #Kenosha. Although he had an AR15 he was not confronted by police or SWAT but ignored & allowed to walk out of the area. @KenoshaPolice shoot unarmed Black men but see armed white men as allies. [url] "	.986	135,860	45.58
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Table 5.
 Topics in the legitimacy theme

Topics	Examples	Consistency	N	Case (%)
	Floyd			
Prioritize community	<p>1 - " Minneapolis City Council voted today to disband @MinneapolisPD and replace it w/ a community-led system that prioritizes community safety/health! That's REAL accountability for a BROKEN Dept w/ illegal procedures and failure to discipline corrupt officers! #JusticeForGeorgeFloyd [url]"</p> <p>2 - "One small step: the officers involved in the @MinneapolisPD's killing of #GeorgeFloyd have been fired. So many more steps need to be taken now: press criminal charges, take on the racist Police Federation led by Kroll, defund the police, fund community safety. "</p>	.961	9,046	5.50
Sanctioned serial killers	<p>1 - "Hey @MinneapolisPD you've got a bit of a burgeoning state-sanctioned serial killer problem huh? #minneapolisriots [url]"</p> <p>2 - "Are you fuckin serious !!! This man is a fucking serial killer !!! #Fuck12 @MinneapolisPD you guys must be truly idiots ! The people that let him go on to be a "officer of the law" should all go to prison too ! [url]"</p>	.882	2,108	1.28
Held accountable	<p>1 - ""PETITION: ""I can't breathe"" George Floyd's last words as @MinneapolisPD choked him to death. They ALL must be held accountable @HennepinAtty must charge them w/murder and @[user] must block their pensions and ban them from becoming cops again. SIGN: [url]""</p> <p>2 - " It's not just individuals that are in the system it's the dna ?? of the system! They've covered up for him for YEARS @MinneapolisPD you are as much to blame for George Floyd's death as his 4 murderers #ShameOnYou [url]"</p>	.878	46.323	28.16
	Blake			

Defund the police and reform	<p>1 - ""@[user] @[user]@KenoshaPolice So! The Police have been illegally killing unarmed Black men for decades. Pick one genius. Same was true when Obama was pres #DefundThePolice"</p> <p>2 - ""@[user_media] @[user_media] STOP COVERING RNC and Trump no one cares. Cover @KenoshaPolice and the killing of #JacobBlake I'm tired of this BS we need our own news network and party Remind America of what's going on OUR REALITY Sick of it all #EndQualifiedImmunity #DefundThePolice #protectourown"</p>	.835	6,973	2.34
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**Table 6 : Summary of Negative Online Reactions Topics to the Floyd event (FE)
and the Blake event (BE)**

	Micro level	Macro level
Directly related to event	pepper spray (FE), traumatized kids (BE), hospital bed (BE), sanctioned serial killers (FE)	white power link Minneapolis PD (FE), similarly white choked (FE)
Collateral effects	broad daylight video (FE), neck restraints (FE), held accountable (FE)	Caucasian community policing (FE), apolitical right wing (BE), prioritize community (FE), defund the police and reform (BE)