Whose Death Matters? A Quantitative Analysis of Media Attention to Deaths of Black Americans in Police Confrontations, 2013–2016

ETHAN ZUCKERMAN
Massachusetts Institute of Technology, USA

J. NATHAN MATIAS
Cornell University, USA

RAHUL BHARGAVA
Massachusetts Institute of Technology, USA

FERNANDO BERMEJO
IE University, Spain

ALLAN KO
Massachusetts Institute of Technology, USA

Media coverage of deaths of unarmed people of color at the hands of police sharply increased after the high-profile death of Michael Brown. We analyze a novel set of media data to understand reasons for this rise and to postulate a shift in reporting that treats these deaths as part of a larger pattern, crystallized around the "key event" of Michael Brown's death rather than as unconnected incidents. We see a "news wave" that resulted in increased coverage and sharing of stories about deaths of people of color at the hands of police that aligned with activist efforts such as the Black Lives Matter movement. Our quantitative methods suggest a mechanism for tracking effectiveness of activist efforts to change the framing of important social phenomena in the news.

Keywords: activism, agenda setting, race, policing, news media, journalism, Media Cloud, quantitative methods, social media

Ethan Zuckerman: ethanz@mit.edu
J. Nathan Matias: natematias@gmail.com
Rahul Bhargava: rahulbot@media.mit.edu
Fernando Bermejo: fbermejo@faculty.ie.edu
Allan Ko: allanko@mit.edu
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Deaths of Black men at the hands of police became a central issue in U.S. news media in the summer of 2014. On July 17, 2014, Eric Garner was arrested in Staten Island, New York, for selling loose cigarettes and died after police applied a chokehold to subdue him. Less than a month later, on August 9, 18-year-old Michael Brown was fatally shot by police officer Darren Wilson after an altercation in Ferguson, Missouri. Brown's death and the subsequent response by Ferguson police led to waves of protests and to the increased visibility of the broader issue of police violence against Black citizens.

Our analysis focuses on questions of whether and how the deaths of unarmed Black citizens at the hands of law enforcement receive media attention. We tested the hypotheses that subsequent deaths of unarmed Black citizens at the hands of police became more widely covered in news media after Michael Brown's death, and that these stories were more frequently shared. We also tested the hypothesis that stories about deaths of unarmed Black citizens at the hands of police were more often presented as part of a larger narrative, not as isolated incidents, after Michael Brown's death.

We used databases of police-involved killings to compile a list of victims, the Media Cloud system to retrieve stories about each victim, and the Facebook API to track social media attention to the retrieved stories. Based on analysis of these data, we found evidence for a significant shift in attention to stories about police killings of unarmed Black men in the wake of Michael Brown's death, which we considered a "key event" in changing the media framing of these deaths. In addition to an increased volume of coverage, we saw evidence that police-involved deaths after Michael Brown's death were significantly more likely to be reported on as part of a larger pattern of police violence against Black citizens, and some evidence that these stories were more likely to be shared on social media.

Our research suggests that media narratives contextualize individual events as part of a larger narrative, a "news wave," which helps draw attention to a significant, but diffuse, phenomenon such as disproportionate violence against Black citizens by police. Although our research focuses on correlation, not causation, we speculate, based on our findings, that activist efforts such as Black Lives Matter help frame individual deaths as part of a larger pattern, contributing to the construction of a media agenda that addresses larger issues of race, bias, and policing.

Background

Black Americans disproportionately experience negative impacts from policing in a number of ways. Gelman, Fagan, and Kiss (2012) found that non-White suspects are stopped and frisked by police in New York at higher rates than White suspects. Nix, Campbell, Byers, and Alpert (2017) found that when police officers shoot civilians, Black victims are twice as likely to be unarmed as White victims. According to U.S. Department of Justice statistics, Black suspects are five times more likely to die at the hands of a police officer than White suspects (Brown & Langan, 2001). Many studies, including Correll et al. (2007), found that in computer simulations, both civilian and police participants are faster and more likely to shoot unarmed Black suspects than unarmed White suspects.

From mid-2014 through 2016, police killings of Black Americans emerged as a major topic in American media, leading to such popular press headlines as "Why Are So Many Black Americans Killed by Police?" (Bialik,

2016b). High media attention deaths, such as those of Eric Garner, Michael Brown and Tamir Rice, led journalists and their readers to wonder whether (1) Black people were being killed by police at an increasing rate, or whether (2) readers were simply hearing about more of these deaths. In addition, the Black Lives Matter movement called attention to the phenomenon of Black Americans killed by police. Were their efforts responsible for increasing attention to the problem?

The first question—are more Black Americans being killed by police than in the past?—is difficult to answer because there is no single, national database of use of force by the nation's roughly 15,400 police departments (Reaves, 2015). The Bureau of Justice Statistics estimates that its figures capture only 36–49% of these deaths (Banks, Couzens, Blanton, & Cribb, 2015). *The Washington Post* and *The Guardian* have launched efforts to track civilian deaths by law enforcement, complementing citizen efforts including Fatal Encounters, Mapping Police Violence, Killed by Police, and the Gun Violence Archive (Burghart, 2019 Fatal Encounters, 2017; Gun Violence Archive, 2019; Killed by Police, 2017; Mapping Police Violence, 2017; Swaine, Laughland, Lartey, & McCarthy, 2016).

These independent data sets confirm that official data far undercount these deaths. Researchers from the School of Public Health at Harvard University compared *The Guardian*'s 2015 police killings database with information from the National Vital Statistics System, and found that more than half of deaths due to law enforcement were not officially documented as such on death certificates in the United States. Their analysis showed that 55.2% of all police killings were misclassified as not having been a result of interactions with police, a gross inaccuracy in the monitoring of police violence, one that was found to be exacerbated in low-income jurisdictions (Feldman, Gruskin, Coull, & Krieger, 2017). In 2015, James Comey, then director of the FBI, went so far as to say, "It is unacceptable that *The Washington Post* and *The Guardian* newspaper from the U.K. are becoming the lead source of information about violent encounters between police and civilians. That is not good for anybody" (Davis & Lowery, 2015, para. 3). Although disparate initiatives may use different methods and come up with different counts, a meta-analysis from Bialik suggests that deaths from police violence are steady, as is the disproportionate impact of violence against Black people, who represent 13% of the U.S. population and 24% of those killed by police (Bialik 2016a; Lowery, 2016).

Our research began as an attempt to answer that second question: Are the media paying more attention to these deaths than in the past? We understand media attention as the result of a complex set of factors. Audience attention is limited by time constraints and is overwhelmed by the endless supply of events that fight for that attention. The process of how we selectively dole out attention is shaped both by the raw material of reality and the journalistic practices, routines, and biases applied to it. The idea of "news values," put forth by the pioneering study by Galtung and Ruge (1965), is central (Harcup & O'Neill, 2001; Staab, 1990) to our understanding of this selection process; because events are not something out there waiting to be covered, but rather journalistic constructions (Fishman, 1982), the focus in analyses of media attention is understandably placed on journalistic practices, making the processes of news gathering and news making central (Fishman, 1980; Gans, 1979; Tuchman, 1978). The convergence of news values and journalistic practices leads to a particular representation of reality. The building blocks of that representation are events.

Despite the difficulty of defining what exactly constitutes an "event" in the media (Fishman, 1982), there have been numerous attempts at classification. Boorstin (1962) talks about pseudoevents; Molotch and

Lester (1974) differentiate among routine events, accidental events, scandals, and serendipitous events; Kepplinger and Habermeier (1995) distinguish among genuine, mediated, and staged events; Dayan and Katz (1992) classify "media events"—already a special kind of event—into contests, conquests, and coronation; and Katz and Liebes (2007) complement that classification with an analysis of "traumatic events," such as disasters, wars, and terrorism.

Especially useful in understanding the phenomena we explore here is the idea of *key events* (Brosius & Eps, 1995; Kepplinger & Habermeier, 1995). Key events are those media events that, because of their resonance with wider issues and their newsworthiness, are able to trigger waves of media coverage (Stanyer, 2014). Key events' ability to trigger media waves leads to a consideration of journalistic practices not as an isolated set of activities carried out by individual journalists or media organizations, but as a collective endeavor in which the activities of some actors affect those conducted by others.

In considering key events, we build on work from Mark Fishman (1978), who observed "waves" of media attention on the topic of crime at a time when crime statistics indicated no significant shift in occurrences. Fishman saw these waves as emerging from "themes" in the media, which group stories together into a larger narrative. Once some reporters recognize an incident or a set of incidents as consistent with a theme, it is easier for them to report on subsequent incidents that fit the theme, and easier for other reporters to write about theme-consistent stories (Fishman, 1978).

Fishman (1978) and Brosius and Eps (1995) see a set of stories within a theme becoming "prototypes," the crystallization of a set of abstract ideas into a concrete story. A set of prototype stories about the same event, which leads to a subsequent wave of coverage, can be considered a key event. Brosius and Eps note that "key events can either create or shape a frame of reference for subsequent media coverage" (p. 407), making it easier for compatible events to receive coverage within the frame. By crystallizing a set of abstract ideas into a concrete story, a key event opens the door for subsequent media coverage of an issue.

How does coverage about isolated events coalesce into a wider theme in news coverage? The change of frame of reference that Brosius and Eps (1995) reference suggests a mechanism to explain a shift from episodic to thematic frames, using Iyengar's (1991) language. This theory informs predictions about news coverage of Black civilian deaths by law enforcement. Prior to the key event of Michael Brown's death, we would expect to see stories focus on discrete episodes and the individual circumstances of a death; after a shift to a thematic frame, we would expect to see deaths contextualized as part of a larger narrative.

Using the Media Cloud database, a collection of online news stories from thousands of media sources each day, we analyzed the number of stories published about unarmed Black Americans killed in police encounters. Analyzing these stories, it appears that Michael Brown was an outlier. A combination of apparent police disregard for his body, which sat in the sun for four hours after his death (Bosman & Goldstein, 2014), and a long history of discriminatory policing in Ferguson (U.S. Department of Justice, 2015) led to a wave of protests and a surge in media attention toward Brown's death. Brown's death accounts for 27% of the stories we examined (8,103 of 30,406 stories about 343 individuals). Work by Deen Freelon (2016) identifies the Ferguson protests that followed Brown's death as the turning point in social media activity during this period.

As such, we decided to exclude Brown from our set and consider his death instead as the key event in the shape of media coverage of deaths at the hands of police.

We examined the time period 2013–2016 because it includes the birth and growth of Black Lives Matter and the larger Movement for Black Lives. In the wake of Trayvon Martin's death in February 2012 and his killer's acquittal, Patrisse Cullors, Opal Tometi, and Alicia Garza began the Black Lives Matter movement. In an editorial for *The Washington Post*, Cullors (2015) called attention to the ways "dead 17-year-old Trayvon was posthumously placed on trial for his own murder" (para. 2). Initially organized by three Black, queer women, the movement has had an antiracist focus, as well as the goal of making pro-Black movements more diverse and inclusive.

Black Lives Matter received little media attention at its founding, but the movement began attracting media attention as activists, incensed by the failure to indict the killers of Michael Brown and Eric Garner, began to identify themselves as part of the movement. The movement has expanded and diversified, and Media Cloud data show that it gained the most media attention in July 2016, when Micah Xavier Johnson ambushed and shot Dallas police who were protecting marchers in protest of the deaths of Philando Castille and Alton Sterling, both Black men killed by police.

Black Lives Matter is often framed by the U.S. political right as a violent movement, with stories linking the movement to the Dallas murders and to property destruction during protests (Andone, 2017; Bennett, 2017; "Loesch: Black Lives Matter Now Fostering More Violence," 2017). Our analysis explores a contrasting narrative, the possibility that Black Lives Matter helped crystallize a set of prototypes around the key event of Michael Brown's death, leading to a news wave focused on the disproportionate impact of police violence against Black Americans.

Our study examined coverage of 343 deaths of unarmed Black Americans at the hands of police, as well as the number of media articles, the sharing of those articles, and the framings used in those articles to investigate differences in coverage before and after Michael Brown's death. In the discussion that follows, we contextualize these findings with attention paid to the Black Lives Matter movement.

Hypotheses

H1: *Chance of coverage*: *Unarmed Black people killed by police received more coverage in the news after the death of Michael Brown, a change that declined over time.*

H1a: *The chance that an unarmed Black person killed by police received at least one news story about them increased after the death of Michael Brown.*

H1b: *The incidence rate of news stories published about an unarmed Black person killed by police increased after the death of Michael Brown and declined from that point onward.*

H2:   *Framing*: *News stories about unarmed Black people killed by police were more likely to frame those deaths in terms of a systemic issue, as measured by the number of other previous deaths mentioned in the article.*

H2a: *The chance that a story mentioned at least one other victim increased after the death of Michael Brown.*

H2b: *The incidence rate of stories framed as a systemic issue increased after the death of Michael Brown and declined from that point onward.*

H3:   *Attention*: *The number of Facebook likes and shares received by stories increased after the death of Michael Brown and declined from that point onward.*

Method

Data Collection

To examine news coverage and social media attention toward police violence, we compiled a data set of victims, news articles about them, and the social media attention received by those articles. These three kinds of data were compiled into two data sets: one of victims and another of news stories. Using those data sets, we tested our hypotheses.

Our data set was built around a list of unarmed Black people killed by police or who died under the custody of police in the United States from January 2013 through the end of June 2016. We based this data set on research by *The Guardian*, *The Washington Post*, and Mapping Police Violence (Fatal Encounters, 2017; Mapping Police Violence, 2017; Swaine et al., 2016). Analysis of police violence in 2013 and 2014 relied solely on the list of unarmed Black victims provided by Mapping Police Violence. Analysis of police violence in 2015 relied on a combined list from all three sources. Analysis of police violence in 2016 was provided by *The Washington Post* and *The Guardian* data.

We included only victims explicitly coded by the source as "Black." Details about how we coded victims as "unarmed" are available in the online appendices at https://mediacloud.org/publications/whose-lives-matter-appendices

The full data set of unarmed Black people killed by police or who died in police custody included a total of 343 people who died from January 4, 2013, to June 29, 2016. Within this data set, Michael Brown's death occurred on August 9, 2014, the 581th day in the data set. Because our hypotheses compared coverage before and after Brown's death, we removed Michael Brown and any people who died in the 14-day period up to and including the day of his death. The complete data set included 333 people.

Within the data set of people, we observed the number of days that elapsed since the first observation in the data set, as well as whether a person was killed in the period after Michael Brown's death. Mapping Police Violence lists the date as "date of injury resulting in death," whereas *The Washington Post*

and *The Guardian* list only the "date" (Fatal Encounters, 2017; Mapping Police Violence, 2017; Swaine et al., 2016). This resulted in some discrepancies in the date of the "event." For one-day discrepancies, we used the earlier date.

We also recorded the gender of the victim as reported in the news articles, his or her age, and the population of the metropolitan area where the person was killed (see Table 1). Population data for each city were manually retrieved from the U.S. Census Bureau's American FactFinder tool. If the listed city was unavailable, we used Wikipedia. If Wikipedia did not provide the information, we estimated the population using the city's ZIP code(s).

Table 1. Summary of Individuals Considered, Gender, Age, and Population Ranges.

Victim	Death count	Minimum age (years)	Median age (years)	Maximum age (years)	Minimum population	Median population	Maximum population
Overall	333	1	30	74	553	144,186	308,745,538
Women	24	18	32	64	5,770	118,692.5	8,175,133
Men	309	1	30	74	553	145,786	308,745,538

Starting with this list of Black people killed by police, we used the Media Cloud system to develop an archive of news stories that mentioned the people. For this study, we searched 1,124 sources categorized as mainstream news, regional news, or politically oriented news. Within those, we discovered articles from 518 media sources in the United States.

For each person killed, we created a custom query of the Media Cloud data set within the two-week period following their death. Media Cloud is a database of news stories, blog entries, and Web pages maintained by a team at Harvard's Berkman Klein Center and the Massachusetts Institute of Technology's Center for Civic Media. Media Cloud regularly indexes more than 50,000 news sources and provides retrospective coverage for many sources going back to 2010, and offers both a Web interface and an API to enable researchers to conduct searches (Faris, 2015; Graeff, 2014). We disabled a Media Cloud function that allows the system to spider the Web for mentions of a search term as we wanted to compare coverage of deaths within Media Cloud's core set of 50,000 sources.

Our Media Cloud queries were created using an iterative process to filter false positives from the data set.[1] For example, the former governor of California shares a name with Jerry Brown, a 41-year-old Black man from Zephyrhills, Florida, who was killed in 2015 by a narcotics detective. To filter out mentions of the governor, the final query searched for the deceased's middle name and the name of the region where he was killed, as well as excluding mentions of California:

> "Jerry Dwight Brown" OR ("jerry brown" AND (pasco OR zephyrhills OR fl OR florida)) AND
> -(gov* or CA or california or sacramento or democrat*)

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[1] The data set for this study included query details for each individual in the set.

Among the stories returned by our queries of the Media Cloud data set, we queried Facebook for a count of the number of likes and shares that those stories received. All of these queries were conducted after the death of Michael Brown. Because different articles were public for different periods of time before we sampled information from Facebook, we adjusted our models using a measure of the number of days that elapsed between the publication of the article and our Facebook sample.

Outcome Variables

Our analysis of media coverage of individuals' deaths (H1) used a data set created with one row per person.
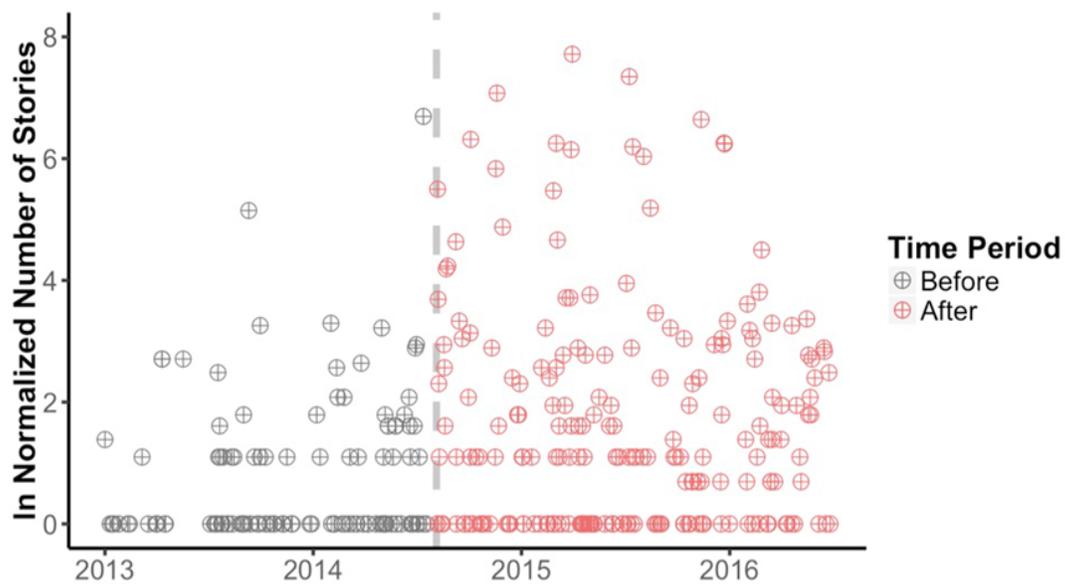
Figure 1. Log-transformed, normalized number of news stories mentioning an unarmed Black person killed by police in the United States from January 2013 through June 2016. The dashed vertical line indicates the death of Michael Brown.

***Table 2. Summary of the Number of People Whose Death by Police in the United States Was
Mentioned in at Least One Article, Before and After the Death of Michael Brown.***

Period	No articles	Some articles	Total
Before Brown, *n*	68	45	113
Row, %	60.18	39.82	33.93
After Brown, *n*	80	140	220
Row, %	36.36	63.64	66.07
Total	148	185	333

We observed the count of additional individuals from the list of the deceased who were mentioned in the story, including Michael Brown and others who died in the 14 days before his death (H1b; see Figure 2).
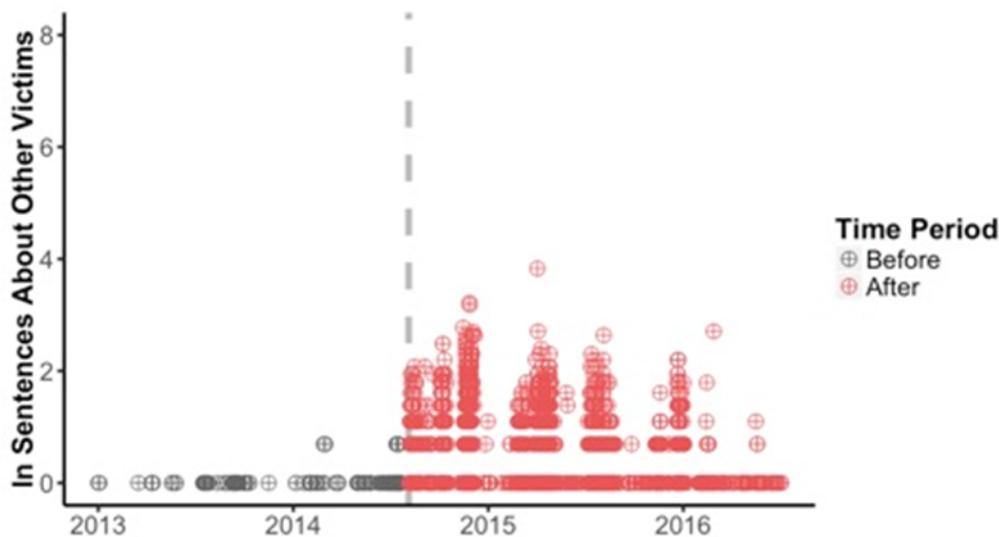
Figure 2. Log-transformed number of sentences mentioning victims, for stories mentioning at least one unarmed Black person killed by police from January 2013 through June 2016. The dashed vertical line indicates the death of Michael Brown.

We also observed a binary measure of whether more than one victim was mentioned in the story (H1a; see Table 3). Our analysis of social media attention (H3) considered a data set with one row per story, recording the numerical counts of likes and shares received by the story on Facebook, as reported by the Facebook API. We observed the number of likes and shares received by each story (H3b; see Figure 7).

Table 3. Summary of the Number of Stories That Mentioned at Least Two Unarmed Black Persons Killed by the Police, in Addition to the Subject of the Story, Before and After the Death of Michael Brown.

Period	Mentioned one person	Mentioned at least two people	Total
Before Brown, *n*	730	20	750
Row, %	97.33	2.67%	6.75
After Brown, *n*	7,965	2,398	10,363
Row, %	76.86	23.14	93.25
Total	8,695	2,418	11,113

Findings

Coverage Changes: Chance of News Coverage

To test the hypothesis of an increase in news coverage after the death of Michael Brown (H1a), we used a logistic regression model to estimate the chance that a person killed by police, or who died in their custody, would have at least one article mention the deceased's name. To improve the precision of our estimate of the difference, we included regression adjustments for the gender of the person as reported in the news, the reported age, and the population of metropolitan area where the death occurred.

We found that in the 580 days before Michael Brown's death, a 33-year-old Black man killed by police in a city with the median population had, on average, a 39.34% chance of having at least one article published about him. In the 691 days after Brown's death, a similar person had a 64.25% chance of having an article published about him on average, a statistically significant difference of 24.92 percentage points (p = .00003).

It is worth asking whether this increase in likelihood was primarily associated with a small number of high-visibility deaths in the period after Michael Brown's death. In the Appendix, we examine this in detail and demonstrate that our findings are robust even with four highly visible deaths removed from our data set.
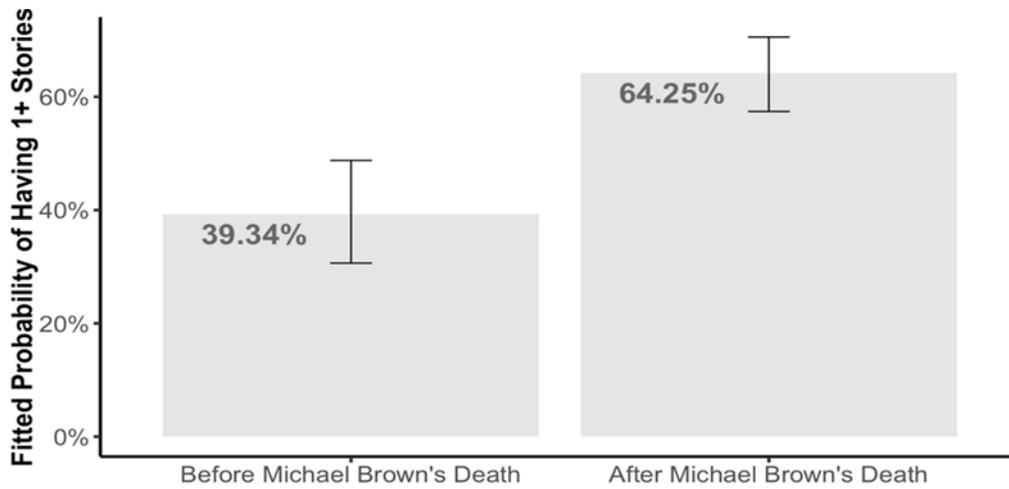
Figure 3. Change in chance of media coverage of a death before and after Michael Brown's death.

Coverage Changes: Incidence Rate of News Coverage

We also tested the hypothesis that an increase in the incidence rate of coverage of Black people killed by police would declines over time (H1b). To test this hypothesis, we used a negative binomial model (Long, 1997) that estimated the incidence rate of the normalized number of articles published about a person in the 14-day period after their death ($t = 1$). In the model, we tested the hypothesis of a cubic relationship between the day count (*Day*) and the incidence rate, controlling for age (*Age*), gender (*Male*), and population (*lnPop*):

$$\tilde{\mu}_i = \exp\left(\ln(t_i) + \alpha_i + \beta_{1i}Age_i + \beta_{2i}Male_{2i} + \beta_{3i}lnPop_{3i} + \beta_{4i}Day_{4i} + \beta_{5i}Day_{5i}^2 + \beta_{6i}Day_{6i}^3 + \epsilon_i\right)$$

In the model of stories per person (see Appendix Table A2), we found that the incidence rate for a prototypical 30-year-old man killed in a region of median population increased to a maximum rate between 61 and 152 times 312 days after Michael Brown's death. After that day, the rate declined on average. By the end of our observation period, the incidence rate of stories declined to the point that 95% confidence intervals overlapped with those at the beginning of our sample, and the difference between them was not statistically significant.
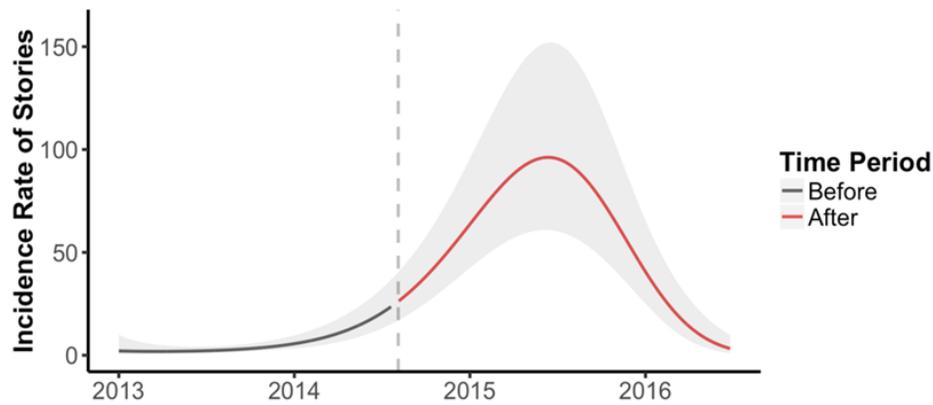
Figure 4. Fitted incidence rate of stories about the death of an unarmed Black person killed by police in the two-week period after the death, from 2013 through mid-2016. The dashed vertical line indicates the death of Michael Brown.

Frame Changes: Chance of Including a Wider Frame

To test the hypothesis of a change in the framing of stories after the death of Michael Brown (H2), we used a logistic regression model to estimate the chance of a story including a mention of at least one other person (H2a). To improve the precision of our estimate of the difference, we included regression adjustments for the gender of the person as reported in the news, the reported age, and the population of metropolitan area where the death occurred.

In a logistic regression model on the 11,113 stories in our sample, in the 580 days before Michael Brown's death, we found that for an unarmed, 33-year-old Black man killed by police in a city of median size, a story had a 2.44% chance of mentioning a previous victim on average. In the 688 days after Michael Brown's death, a similar story had a 20.71% chance of including at least one mention of another victim on average, an estimated difference of 18.26 percentage points.
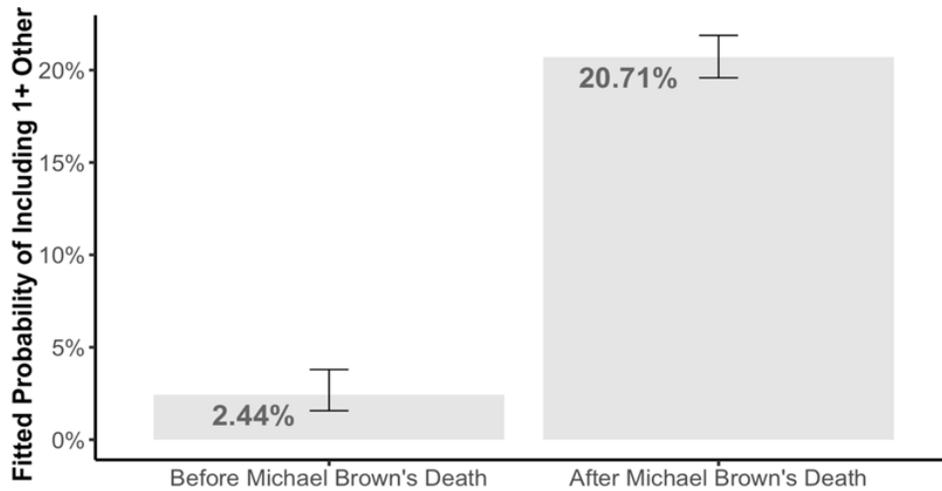
Figure 5. Change in fitted probability of a story to mention additional victims.

Frame Changes: Incidence Rate of Including Other Names

We also tested the frame-change hypothesis by estimating changes in the incidence rate of mentions of other victims in stories, expecting that the rate would increase after the death of Michael Brown and decline over time (H2b). To test this hypothesis, we used a negative binomial model that predicted the incidence rate of sentences mentioning other victims for stories published about a person in the 14-day period after his or her death. In a model of mentions of victims in a single story ($t_i = 1$), we tested the hypothesis of a cubic relationship between the day count (*Day*) and the incidence rate, as well as a change in that relationship after the death of Michael Brown (*Brown*), controlling for age (*Age*), gender (*Male*), and population (*lnPop*):

$$\widetilde{\mu}_t = \exp\left(\ln(t_i) + \alpha_i + \beta_1 Age_{1i} + \beta_2 Male_{2i} + \beta_3 lnPop_{3i} + \beta_4 Brown_{4i} + \beta_5 Day_{5i} + \beta_6 Day_{6i}^2 + \beta_7 Day_{7i}^3 + \beta_8 Brown \times Day_{8i} + \beta_9 Brown \times Day_{9i}^2 + \beta_{10} Brown \times Day_{10i}^3 + \epsilon_i\right)$$

In the model of stories per person (see Table 8 in Appendix and Figure 6), we found that the incidence rate of other victims mentioned in stories did increase after the death of Michael Brown to an estimate between 1.92 and 3.04. The rate then declined on average after Michael Brown's death. By the end of our observation period, the incidence rate had declined to an estimated value of 0.17, which was still greater than the incidence rate of 0.00 at the beginning of the observation period, a difference that was statistically significant.
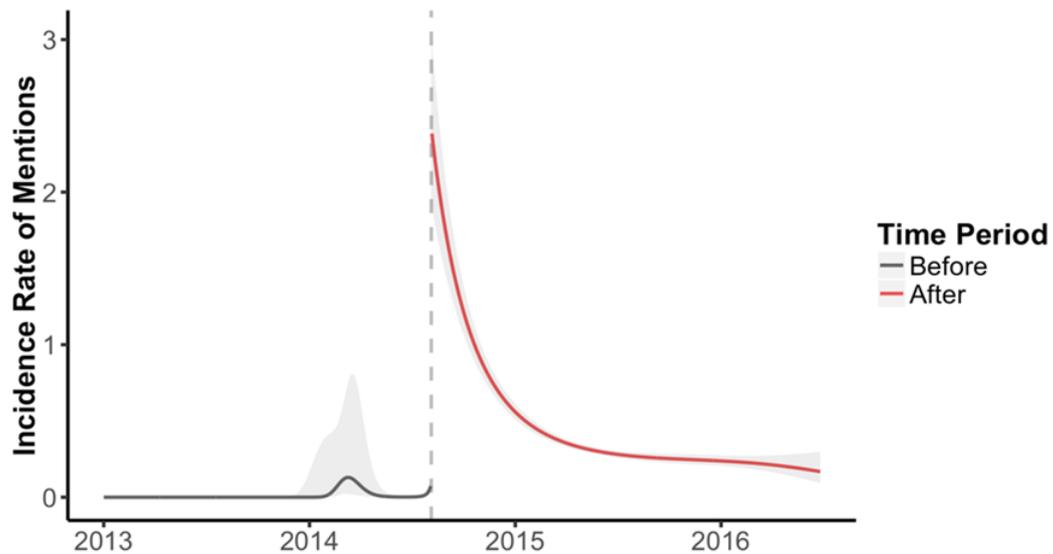
Figure 6. Estimated incidence rate of stories including names of other victims. The dashed vertical line indicates the death of Michael Brown.

Frame Changes: Changes in Social Media Attention

Finally, we tested the hypothesis that the number of Facebook likes and shares received by stories increased after the death of Michael Brown and declined from that point onward (H3). Likes and shares received by articles can be influenced by many factors, including promotion by a news organization and attention from audiences. For this hypothesis, we considered the data set of 188 people whose deaths were the subject of at least one article in the 14-day period after their deaths. We observed the total sum of all Facebook shares and likes received by any of those articles. We also observed the mean number of days between the publication of an article and the time we sampled data from Facebook, which ranged from 45 to 1,455. All Facebook data were sampled well after the death of Michael Brown; the earliest sample date was February 19, 2015.
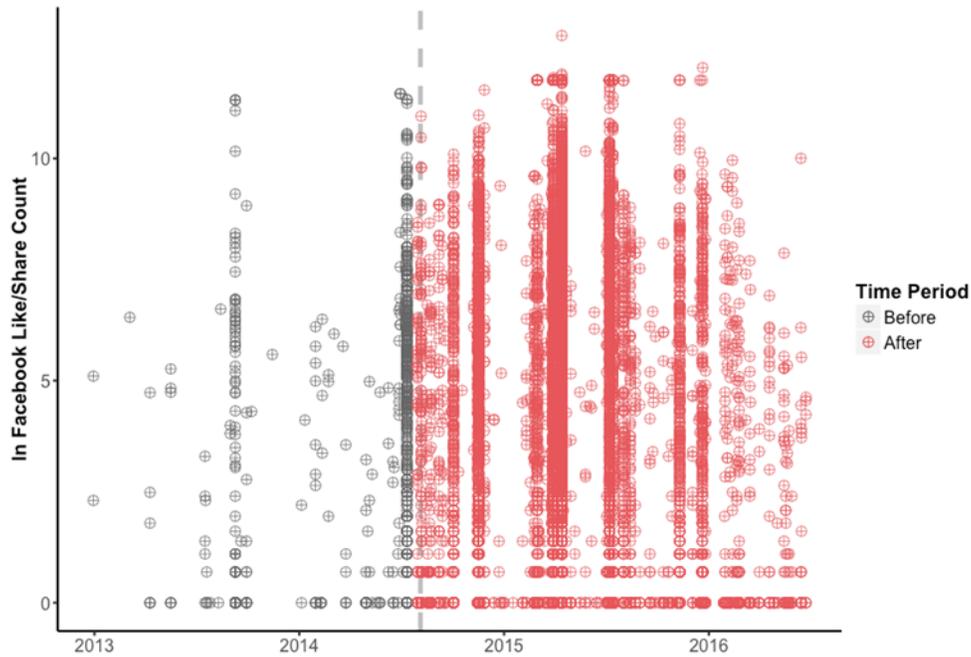
Figure 7. Log-transformed total Facebook shares per victim. The dashed vertical line indicates the death of Michael Brown.

To test this hypothesis, we fit a negative binomial regression estimating the incidence rate of total Facebook likes and shares received by all articles about an unarmed Black person killed by police ($t = 1$). The model estimated an exponential relationship between the incidence rate and the day of death (*Day*, *Day$_2$*) and adjusted for age (*Age*), gender (*Male*), population (*lnPop*), the normalized number of stories published about the person (*lnStories*), and the days elapsed between the death and the day that the Facebook likes and shares were sampled (*SampleDays*):

$$\tilde{\mu}_i = \exp\left(\ln(t_i) + \alpha_i + \beta_{1i}Brown + \beta_{2i}Age_{2i} + \beta_{3i}Male_{3i} + \beta_{4i}lnPop_{4i} + \beta_{5i}Day_{5i} + \beta_{6i}Day_{6i}^2 + \beta_{7i}SampleDays_{7i} + \beta_8 lnStories + \epsilon_i\right)$$

In the model of social media attention, we did not find a statistically significant difference in the rate of Facebook shares and likes immediately after the death of Michael Brown, an outcome that was likely the result of people sharing past articles about prior deaths as the Black Lives Matter movement became prominent. Over time, the estimated incidence rate of total Facebook shares received by all articles about a prototypical 30-year-old Black victim in a town of median population increased from seven to a maximum of 9,266 on average after the death of Michael Brown, before declining slightly in the final observed days.
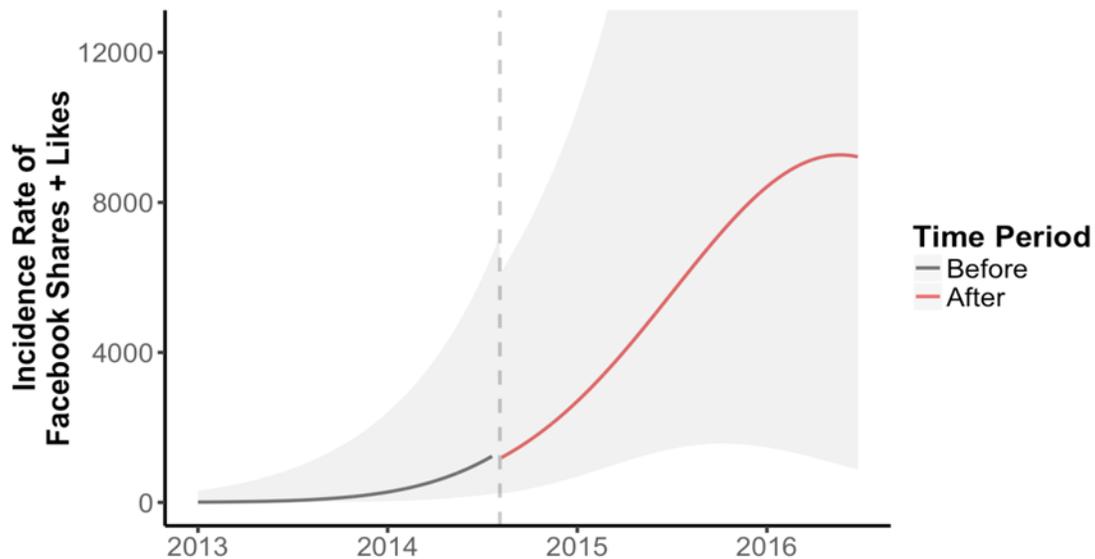
Figure 8. Estimated incidence rate of Facebook shares and likes for a prototypical person of median age, regional population, and number of stories. Upper confidence intervals are truncated for readability. The estimated confidence interval for the number of shares and likes received by articles about a person killed on the final day ranges from 878 to 96,674. The dashed vertical line indicates the death of Michael Brown.

Discussion

The limitations in our study arise from limitations in the data sets and modeling approaches for our hypotheses. Overall, none of our models tested causal hypotheses; instead, they observed systematic differences over time. We do not argue that the death of Michael Brown caused anything. Rather, we expected from other research on Black Lives Matter that a number of different actors including social movements, publishers, audiences, and government officials contributed to the patterns we observed. Our research does not distinguish between these causes or study their relationships; we merely observed the outcomes of those complex interactions on the presence of stories, the framing of those stories, and the social media attention given to those stories.

Among limitations in our data, we may not have had the full list of unarmed Black people killed by police. In particular, our data set may have been biased toward people who appeared in stories, especially for the period before *The Washington Post* and *The Guardian*. Yet, 80 unarmed Black people killed by police after the death of Michael Brown also had no stories written about them. Furthermore, any bias from missing data before the death of Michael Brown would have led us to underestimate the difference in media coverage after his death given that our data set would have been more likely to include cases with no coverage after Brown's death.

It is also possible that the Media Cloud data set might have undercounted the stories involved. This is especially possible because our queries tended to constrain the set to stories that included a full name or

that mentioned the place of death. For example, it is possible that systematic differences in authorial assumptions about audience awareness might have caused us to undercount stories published after the death of Michael Brown, if writers assumed that their readers already knew basic details such as the location of the deaths of Sandra Bland, Tamir Rice, and others. If so, then the systematic differences we describe could be even more prominent than we observed in our models.

The data used for our social media analysis included the limitation that we collected all Facebook like and share counts after the death of Michael Brown. Social media movements collaborated to find and share articles about unarmed Black people killed by police in the past, collaborative work that produced the data sets we relied on. Consequently, we expected that our results would underestimate the difference in social media attention before and after the death of Michael Brown. Differences in the time elapsed between publication and social media sampling also could contribute another possible source of bias, which we adjusted for in the model for Hypothesis 3.

It is possible that the results for our hypothesis tests on framing (H2) were biased given that our dependent variable counted the number of previous deaths that were mentioned in a story. For a story about the very first death in our data set, it was not possible for the story to include mention of any others because there were no other prior deaths in the data set. Consequently, we might have undercounted the presence of a frame focused on multiple deaths in the very first months of the data set, and our model may have overestimated the difference in the incidence rate of mentions after the death of Michael Brown. We addressed this risk by modeling the incidence rate of comentions with a cubic relationship to time. In our model, the fitted estimates of comentions remained at or close to zero well after the number of eligible deaths had increased beyond possible inclusion in a story. In the period before Michael Brown's death, the rate of comentions briefly increased and then decreased again before a large, statistically significant difference after his death (see Figure 6).

Our analysis of Media Cloud data confirmed Hypothesis 1: We clearly see increased coverage of the deaths of unarmed Black people after the death of Michael Brown. Figure 9 demonstrates that Hypothesis 1a was confirmed: After Michael Brown's death, significantly fewer deaths went entirely unreported. Furthermore, there was an increase post-Michael Brown throughout the distribution. We saw fewer deaths that went unreported, and although we saw more high-visibility deaths, we also saw an increase in deaths reported at low intensity, implying a short period of local coverage, and a set of stories reported at high intensity, implying either a short period of national coverage or an extended period of local coverage.
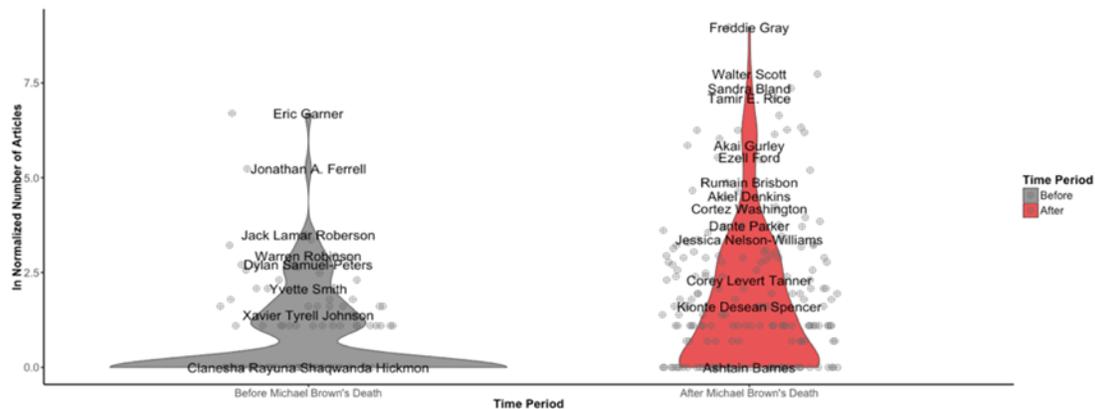
*Figure 9. Violin plots of log-transformed, normalized media stories about each death in our data set.*

The steep decay in the attention curve in Figure 4 confirms Hypothesis 1b, and offers evidence to support Down's (1972) theory of attention cycles. We see an increase in stories after Michael Brown's death increasing until almost a year after his death, then a return to a rate statistically indistinguishable from the period before his death. This finding is consistent with the understanding of Michael Brown's death as a key event. Michael Brown's death and the attention paid to it by media outlets seem to have crystallized a narrative around deaths of unarmed Black people in police confrontations.

Our findings also confirmed Hypothesis 2, that news stories about unarmed Black people killed by police were more likely to frame those deaths as part of a systemic issue. Before Michael Brown's death, very few stories mentioned additional victims (2.44%). After his death, more than eight times as many did (20.71%). Michael Brown was the most frequently invoked additional name in these stories, supporting the idea that his death and subsequent protests were key events in redirecting attention to subsequent deaths.

In understanding the sharp rise in stories after Michael Brown's death and their framing, it is helpful to look at media attention to the Black Lives Matter movement. Using the Media Cloud system and searching against the "U.S. Media" collections for

"black lives matter" OR "Movement for Black Lives" OR "#BLM" OR ("BLM" AND –"Bureau")

yields a graph of attention to the movement with a rise in attention roughly a year after Michael Brown's death and a sharp peak in July 2016.
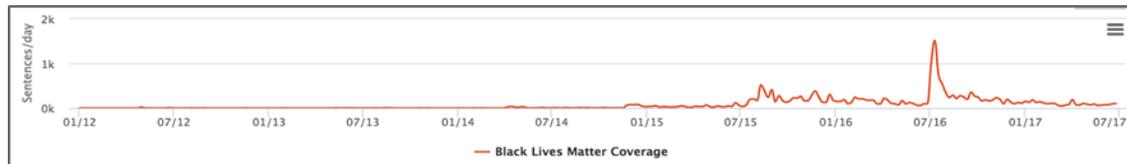
***Figure 10. Attention to stories about Black Lives Matter from 2012 to mid-2017, in Media
Cloud's U.S. Media data set.***

Given the peak of attention to stories in our data set seen in July 2015 (see Figure 4), it is likely that the Black Lives Matter movement was part of a set of forces contributing to increased attention to deaths of unarmed Black people killed by police. Examining stories in our set, only six of 2,940 stories that appeared before Michael Brown's death mentioned Black Lives Matter. A year after Brown's death, 3% (727/21,123) of stories mentioned the movement. Two years after his death, 26% (593/2,249) of stories in our data set mentioned the movement. This increase suggests a narrative in which stories in our data set were first understood as part of a trend identified by a key event (Michael Brown's death) and then part of a newly adopted frame (Black Lives Matter).

But attention to Black Lives Matter has not been purely about attention-raising activist activities. The peak of attention to Black Lives Matter was in July 2016, when Michael Xavier Johnson opened fire on Dallas Police who were protecting marchers protesting the deaths of Alton Sterling and Philando Castille. Johnson had expressed grievances with treatment of Black people in the United States, but was not affiliated with Black Lives Matter or any other Black rights movement; he had been rejected from the Collective Black People's Movement (part of the Movement for Black Lives) and was earlier thrown out of the New Black Panther Party for incendiary and dangerous rhetoric ("Dallas Shooter" 2016; Herron, 2016). Despite Johnson's distance from Black Lives Matter, the organization featured prominently in coverage of the Dallas shootings, particularly in conservative media, where right-wing media sources used the shooting to characterize Black Lives Matter as connected to thugs, riots, terrorism, and the Black Panthers.
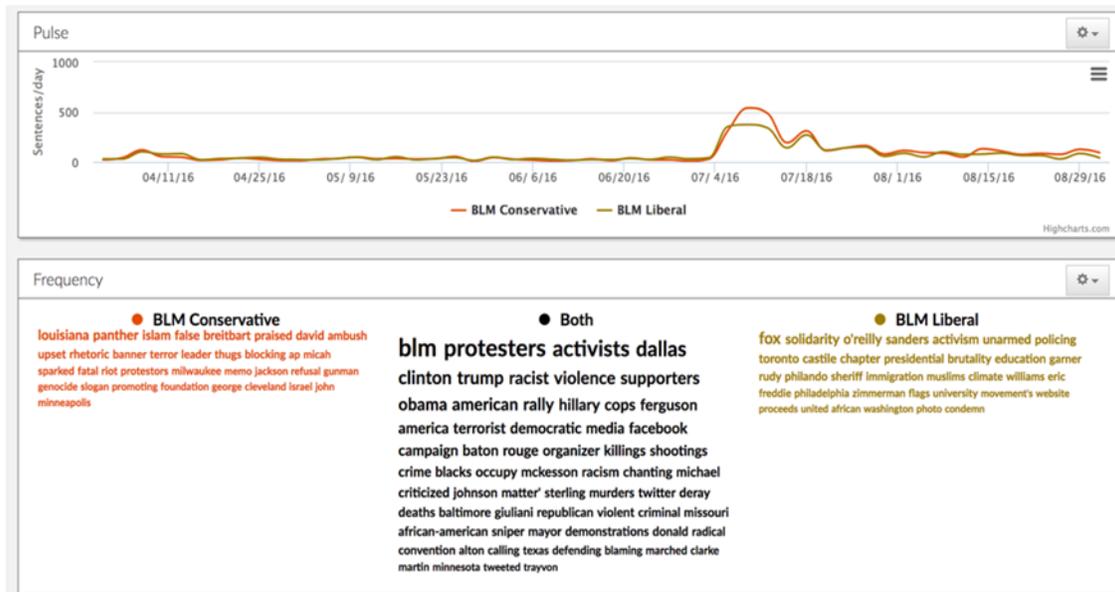
Figure 11. Comparing attention to and framing of Black Lives Matter in the period surrounding the Dallas police shootings, using Media Cloud's Conservative Partisan Media and Liberal Partisan Media data sets.

These figures suggest a narrative in four acts. Before Michael Brown, deaths of unarmed Black people in police encounters were reported on individually, and not considered as part of a larger movement. After the key event of Michael Brown's death, a news wave paid closer attention these deaths, frequently invoking Michael Brown's death to characterize them as part of a larger frame. As Black Lives Matter increased in visibility, it became a clearer shorthand for the idea that these deaths were part of a larger trend. Finally, and outside the duration of our study, right-wing media began scapegoating Black Lives Matter for the death of Dallas police officers. This complication in the Black Lives Matter narrative is consistent with Down's (1972) predictions about realizations of the cost of progress, leading to decreased interest and public disengagement with the issue.

Although we fail to observe a statistically-significant difference in social media sharing of stories in our data set before and after Michael Brown's death, it is clear that social sharing more than a year after Brown's death was much higher than before. This suggests an appetite from social media users, some of whom may not have identified themselves as part of the Black Lives Matter movement, to read and amplify stories about deaths of unarmed Black people in police encounters. A histogram of media attention to these stories suggests that there may be a disconnect between this demonstrated interest and media coverage.
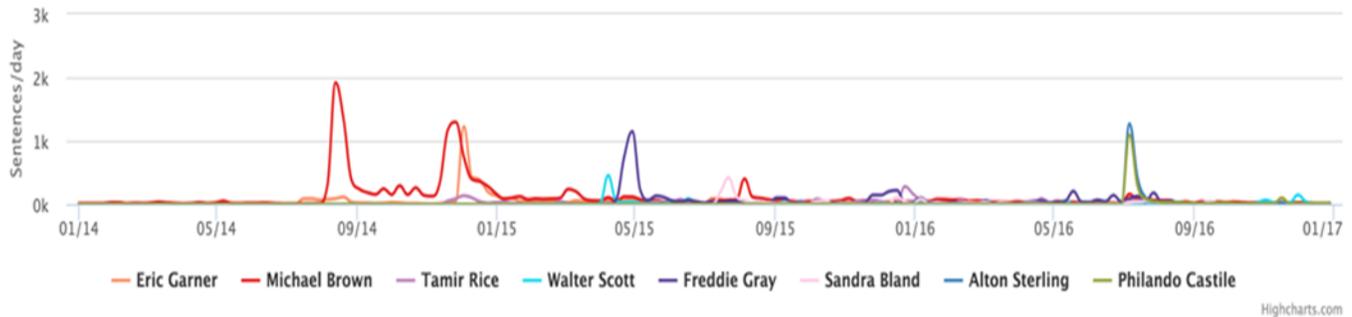
Figure 12. Comparison of media attention to selected deaths of Black individuals in police confrontations, 2014–2016, using Media Cloud's U.S. Media collection.

In 2014, there were spikes of attention to Michael Brown and Eric Garner, with Garner's spike associated with a grand jury's failure to indict his killer rather than with his death, which received only modest reporting. (A similar pattern applies for Tamir Rice, who received a bump of attention in early 2016, when his killer was not convicted.) In 2015, there were spikes of decreasing size for Freddie Gray and Sandra Bland, at a point when social media indicate that readers were starting to share more of these stories.

The sharp spikes in 2016 for Alton Sterling and Philando Castile, killed on subsequent days, align with peaks in social media attention. A first glance suggests that the attention to Sterling's and Castile's deaths may have been a return of media attention to this frame, but just as we expected attention to their deaths to peak, a wave of stories that mention Castile and Sterling focused not on their deaths, but on the Dallas shootings, noting that the shootings took place during a march to protest Castile's and Sterling's deaths. An explanation for the peak in social sharing in mid-2016 may be that a new audience—right-leaning readers not sympathetic to Black Lives Matter—was sharing stories about the Dallas violence that mentioned Castile and Sterling.

An overly simple model of the relationship between social media attention and news coverage would predict that news organizations would continue coverage of these deaths with vigor so long as social media demonstrated an appetite. In this model, activists could ensure the continued focus on a story through continuing to identify and amplify appropriate stories. Instead, we see a drop off in news coverage before a concomitant drop in social media attention.

What then explains this decline in coverage? As Carl Bialik (2016a) notes after Castile's and Sterling's deaths, "The Police Are Killing People as Often as They Were Before Ferguson." As Down (1972) predicts, attention cycles end. After writing several stories within the same frame, reporters and editors may decide that their coverage is getting repetitive and move either to a new way of framing a story or to another story altogether. As the frame becomes more complicated—as it did with the implication that Michael Xavier Johnson had been inspired by Black Lives Matter—public interest in a thematic framing may wane. Finally, in 2016, a new story—the unexpectedly chaotic and dramatic U.S. presidential election—likely pulled journalistic resources away from reporting on police violence and onto the campaign trail.

Conclusion

Since McCombs and Shaw (1972) summarized the media function they were researching by quoting Cohen (1963, p. 13) and stating that media "may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about" (p. 177), agenda setting has been understood both as a core function of journalism and a core space for influence by political campaigns. Our research demonstrates clearly that U.S. media asked audiences to think about the deaths of Black men and women in encounters with police after the death of Michael Brown. Not only do we see a statistically significant increase in media coverage of subsequent deaths, we see a clear reframing of these deaths, connecting them either to other victims (most often Michael Brown) or to the Black Lives Matter movement. Michael Brown's death appears to be the key event that crystallized the story of disproportionate violence against Black citizens by police, enabling a wave of media attention to this problem.

What is far less clear is whether activists were successful in bringing about this shift in media frame. Although media stories rarely mention Black Lives Matter until late in the lifespan of this frame, activists participated in campaigns such as #IfTheyGunnedMeDown that were explicitly aimed at influencing media coverage of Black deaths. This point of view was supported by the rapid mobilization of activists to protest Michael Brown's death and the focus of that coverage on standoffs between those activists and heavily armed police forces.

The null hypothesis—that media covered these deaths independently from activism that aimed to catch media attention—does not hold in the case of Ferguson, where activists in the street shared stories on Twitter, demanding that media players such as CNN pay attention to unfolding events. Understanding the direction of causality post-Ferguson is more difficult, however. Activists in the streets attracted the press, who increased their reporting on deaths of Black people in police encounters. But this increased reporting brought greater scrutiny of the problem by readers, some of whom joined movements such as Black Lives Matter and worked to ensure visibility of subsequent cases.

For at least a year, the death of unarmed Black Americans in encounters with police experienced a wave of attention, as media and their readers began to understand individual deaths as part of a larger pattern. The lessons of this phenomenon are worth consideration for anyone seeking to change public opinion on an issue by taking advantage of media's power to direct what we think about, if not how we think about it. At the same time, the fall off in media attention that precedes the fall off in social media amplification suggests that the relationship between reporting and amplification is not a simple one, and that activist attention is not sufficient to keep a framing in play when an attention cycle comes to a close.

Our work suggests that researchers could use quantitative methods to identify key events that lead to reframing of narratives and to identify when those waves crash and dissipate. For activists, our work suggests both the potential and the limitations of key events for focusing attention. A key event may be essential in moving framing of an issue from the episodic to the thematic, but news cycles have a finite lifespan, and as a framing becomes complicated, it is likely to dissipate even as activists work to sustain it. We further hope that our work demonstrates the utility of quantitative methods in providing information not always apparent from case studies of mediacentric activism. The influence of a movement such as Black

Lives Matter, whose accomplishments include changing how we speak about police violence, are most visible through a combination of narrative and quantitative work, examining influence on a broad media ecosystem. We hope other scholars will find the open-source tools used here useful in analyzing similar phenomena.

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Appendices

In Appendix 1, we include full regression tables in Figures 4–8 with additional methodological details. In Appendix 2, we conducted a set of exploratory, follow-up analyses that revisit the article's main questions using data sets that have removed four people whose deaths received substantial media and advocacy attention—Sandra Bland, Walter Scott, Freddie Gray, and Tamir E. Rice. The appendices can be accessed at https://mediacloud.org/publications/whose-lives-matter-appendices.