

# #HandsOffMyADA: A Twitter Response to the ADA Education and Reform Act

Brooke E. Auxier, Cody L. Buntain, Paul Jaeger, Jennifer Golbeck, Hernisa Kacorri

University of Maryland, College Park

Maryland, USA

bauxier@umd.edu, cbuntain@cs.umd.edu, pjaeger@umd.edu, golbeck@cs.umd.edu, hernisa@umd.edu

## ABSTRACT

Twitter continues to be used increasingly for communication related advocacy, activism, and social change. This is also the case for the disability community. In light of the recently proposed ADA Education and Reform in the United States, we investigate factors for effectiveness of sharing or retweeting messages about topics affecting the rights of people with disabilities. We perform a multifaceted study of the #HandsOffMyADA campaign against the proposed H.R.620 bill to: (1) explore how communication via Twitter compares to previous disability rights movements; (2) characterize the campaign in terms of hashtags, user groups, and content such as accessible multimedia that contribute to dissemination of campaign messages; (3) identify major themes in tweets and responses, and their variation among user groups; and (4) understand how the disability community mobilized for this campaign compared to previous Twitter initiatives.

## CCS CONCEPTS

• **Human-centered computing** → **Social media**; **Social network analysis**; **Empirical studies in accessibility**; *Empirical studies in collaborative and social computing*;

## KEYWORDS

social media, activism, accessibility, disability rights

## ACM Reference Format:

Brooke E. Auxier, Cody L. Buntain, Paul Jaeger, Jennifer Golbeck, Hernisa Kacorri. 2019. #HandsOffMyADA: A Twitter Response to the ADA Education and Reform Act. In *CHI Conference on Human Factors in Computing Systems Proceedings (CHI 2019)*, May 4–9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA, 12 pages. <https://doi.org/10.1145/3290605.3300757>

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for components of this work owned by others than the author(s) must be honored. Abstracting with credit is permitted. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee. Request permissions from [permissions@acm.org](mailto:permissions@acm.org). *CHI 2019, May 4–9, 2019, Glasgow, Scotland UK*

© 2019 Copyright held by the owner/author(s). Publication rights licensed to ACM.

ACM ISBN 978-1-4503-5970-2/19/05...\$15.00

<https://doi.org/10.1145/3290605.3300757>

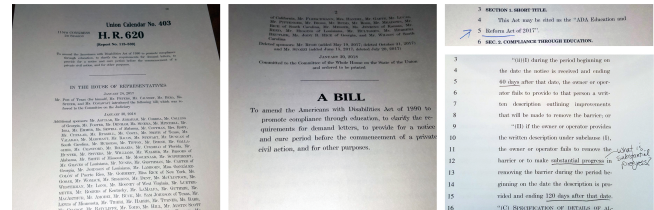


Figure 1: Images from one of the most retweeted tweet threads in our data, part of a breakdown of the bill with explanations. (Permissions granted by Tiffany Bond.)

Glasgow, Scotland UK. ACM, New York, NY, USA, 12 pages. <https://doi.org/10.1145/3290605.3300757>

## 1 INTRODUCTION

Twitter is increasingly used as a medium for advocacy, activism, and social change, but its efficacy is questionable [1, 23, 24, 34]. The disability community, however, has embraced Twitter as a means for political participation, sharing daily encounters of inaccessible spaces [32], fostering discussions on voting [17], calling for a unified identity [30], participating virtually in protests [31], and engaging people through artistic forms of activism [9]. Despite the value online platforms like Twitter have for the disability community [20], these platforms often have limited accessibility support [22]. To counter these issues and increase online participation among people with disabilities, communities such as the Disability Visibility Project<sup>1</sup> provide accessible, step-by-step tutorials explaining how one can join, post, and follow relevant conversations in Twitter [43].

This online participation was tested in early 2018 as activists within the disability community leveraged Twitter in a campaign against new legislation. In the United States (US), civil rights for individuals with disabilities are protected by the Americans with Disabilities Act (ADA), but legislation proposed during the 115<sup>th</sup> US Congress sought to reform the ADA via House Resolution 620 (HR620), the ADA Education

<sup>1</sup><https://disabilityvisibilityproject.com/>

and Reform Act<sup>2</sup>. In response to HR620, the disability community expressed concern that the reform would significantly weaken the ADA’s protection of people with disabilities, and activists within the community protested HR620’s passage, both via Twitter and traditional demonstration. Despite this campaign, HR620 was passed, leaving the following question: *How well are online platforms enabling people with disabilities to engage politically and participate in conversations affecting their rights?*

We explore this question through a multifaceted study of the #HandsOffMyADA campaign against HR620, drawing from work on accessibility and activism [15, 31, 39] and measures of success for activism and advocacy in Twitter [23, 49]. This study’s goals are to: (a) explore how this paradigm shift in communication compares to historical disability rights movements in the US; (b) characterize the campaign in terms of hashtags, users, and other characteristics that contributed to dissemination of campaign messages; (c) identify major themes in the Twitter conversations and how they differ across the observed user groups; and (d) differentiate the disability community’s mobilization for this campaign versus prior Twitter initiatives.

We employ historical, descriptive, qualitative, and comparative analyses to examine a dataset of 14, 246 tweets from 6, 522 users in the campaign during 3 months in 2018 (an example tweet from this #HandsOffMyADA campaign is shown in Figure 1). We find groups tweeting in this campaign were politicians, organizations, people with disabilities, advocates, and journalists; politicians received the most retweets, favorites and comments and journalists the lowest. The tweets mainly voiced users’ stances on the bill, educated others about the bill and upcoming vote, called people to actions, shared personal experiences or those from family members with disabilities, shared dedication to “fighting for the rights” of people with disabilities, and condemned the bill and lawmakers who voted in favor. We also compare two smaller datasets of 482 and 546 tweets around the 2018 #HandsOffMyADA and 2016 #CripTheVote campaigns. While politicians affect retweet volume, this 2016-to-2018 comparison reveals the most central and influential users to be a core group of individuals primarily composed of people with disabilities, disability advocates, and disability organizations.

More importantly, very few tweets contained images, videos and animated GIFs, a strikingly small percentage of which were accessible through alt text for images or open captions on videos. The fact that users who care about disability rights were not providing accessible content highlights the urgent need for an interface that exposes existing and enables new accessibility features in Twitter. Since multimedia is positively related to a campaign’s success [2, 19, 49, 50], as also

confirmed in our findings, the limited accessible media in our data suggests platform affordances may inhibit users from generating accessible content and negatively impact campaigns affecting the disability community. We also find accessible media to be more engaging than standard media, which can be an incentive to include features like alt-text on images.

## 2 RELATED WORK

An abundance of research exists on disability activism facilitated through technology and social media platforms, extensively discussed by Ellis and Kent [15]. In the US, work from Bora *et al.* [4] found accessibility barriers involved with activities like rallies and protests have lead people within the disability community to rely on online platforms for advocacy, where they engage through uploading photos or sharing posts (though barriers exist in these online spaces as well). Recent work by Li *et al.* [31] around the virtual Disability March, which occurred in tandem with the 2017 Women’s March in Washington, D.C., found participants used a variety of platforms for the march, including Twitter, Facebook, Instagram and Tumblr, with the conversation unified around the hashtag #DisabilityMarch. These findings suggest online communities are helpful when activists with disabilities are looking to reach a broad audience and inspire collective action. Another important aspect in Li *et al.* and explored in our analysis is identity-introduced participation, where respondents who considered themselves activists reported feeling compelled to participate in the movement. For individuals who identified as members of the disability community, participation in the Disability March was found to reinforce those identities [31]. At the same time, broader participation in online social movements, often called ‘slacktivism’ [29, 31, 44], is often a low-impact and low-effort way to engage with a cause or social movement. Since social media is an important platform for the disability community [20], our work can better differentiate this political engagement from slacktivism.

Activism aside, social media has often been notably disinterested in disability issues. When a man in Japan publicly informed government employees that he planned to target disabled people, no one stopped him, and he eventually killed several dozen disabled people [16]. Aside from the abject horror of the crime and the apathy shown toward disabled people in Japan, the world’s reaction—or a lack thereof—was just as resounding. For example, Twitter users, who create a hashtag and campaign around many events, did not respond with a hashtag for a mass slaughter of disabled people in Japan. Twitter’s lack of response caused one author to label the worldwide situation as “*disability erasure*” [16] and demonstrates the challenges disability activists and advocates face when reaching out for support in this medium.

<sup>2</sup>[www.congress.gov/bill/115th-congress/house-bill/620](http://www.congress.gov/bill/115th-congress/house-bill/620)

**Table 1: Disability Rights Timeline.**

1964	•	Civil Rights Act.
1973	•	Section 504 of the Rehabilitation Act.
1977	•	Regulations Implementing Section 504.
1990	•	Americans with Disabilities Act (ADA).
2018	•	<b>H.R.620 – ADA Education and Reform Act (Passed the House).</b>

### 3 HISTORICAL ANALYSIS

In the US, civil rights for people with disabilities are primarily based in Section 504 of the Rehabilitation Act, and the ADA.

Passed in 1973, Section 504 of the Rehabilitation Act represented the first comprehensive set of legal rights and protections for disabled people in the US [18]. The law represented a “transformation” of the standing of disabled people in the US by establishing “full social participation as a civil right” [45]. Based on the Civil Rights Act of 1964, which guaranteed freedom from government discrimination based on race, color, or national origin, Section 504 of the Rehabilitation Act marked the first time disabled people were viewed under the law as full citizens in the US— at least it would had it been implemented. President Nixon signed the law, but his administration did little to enable its enactment and enforcement. Thus, the law held little power, and even a successful lawsuit in federal courts did not sway the Nixon, Ford, or Carter administrations to implement it [5, 18, 27, 35]. In fact, the response of the Carter administration was to threaten with guidelines that would strip the law of all of its power [48].

Finally, a series of high-profile, creative, and coordinated protests in 1977 by a wide range of disability organizations and people with many different disabilities made the government act. Disability activists gained media and public attention through innovative actions with clear messages, like wheelchair blockades of the home driveways of high ranking officials in the Carter administration, and more traditional protests, like occupations of government buildings around the country. The most impactful protest, however, was the occupation of the Department of Health, Education, and Welfare building in San Francisco, where 60 people with numerous types of physical, intellectual, and developmental disabilities held the building for 25 days. The federal government cut off food, water, and communication but did offer demeaning incentives to leave, like punch and cookies [21]. The protesters were supported by a network that included McDonald’s, Safeway, the Black Panthers, various unions, and local and state politicians, who worked together to provide food, water, information, and medical supplies to the protesters and bring out their messages [3, 35].

Following the San Francisco occupation, the US Congress held a televised hearing on the Carter administration’s opposition to the Rehabilitation Act. To respond to Congress’ inquiries, the administration sent a low-level official to explain plans to implement the law after exempting educational and health buildings from accessibility requirements and excluding students with disabilities from general education [35]. Backlash against this low-ranking official by members of Congress and the public airing of the administration’s stance, presented against the backdrop of the San Francisco occupation, finally forced the Carter administration to implement the law without diluting its impact.

Little more than a decade later, Congress began considering the ADA. This new law extended the rights of people with disabilities, increasing access to simple everyday transactions from shopping or attending a movie to vital activities like getting a job and attending a university. “*Basically, the ADA extended the protections created by the Rehabilitation Act to most elements of society*” [28]. As with the Rehabilitation Act, coordination among disability rights activists and advocates was central to the law’s passage.

Advocates focused less on gaining attention through the media coverage of protests and instead emphasized coordinated lobbying by disability advocacy groups [47]. The few targeted protests highlighted specific kinds of discrimination in dramatic ways, like wheelchair users and others with mobility impairments crawling up the front stairs of buildings that lacked a ramp or other accessibility features [18]. As with the Rehabilitation Act protests, collaboration between different advocacy groups and people with a range of disabilities and the dissemination of clear messaging were key. A sharp contrast between the battles to pass the Rehabilitation Act and the ADA were the stances of the executive branch. While three consecutive presidents opposed the former, the ADA was championed by President George H. W. Bush, who considered it one of his greatest accomplishments as president. When signing the ADA into law, he stated “*Let the shameful wall of exclusion finally come tumbling down*” [48].

Despite support for the ADA, its 25<sup>th</sup> anniversary was ignored in the 2016 presidential campaign [13, 26]. Then in 2018, the ADA Education and Reform Act, HR620, passed out of the House on February 16, by a vote of 225-192. HR620 expanded the window of time in which businesses would have to respond to ADA complaints. The disability community was concerned this change would greatly reduce the efficacy of the law in protecting the rights of people with disabilities. By the end of March 2018, 42 senators had signed what became known as the Duckworth letter, a passionate rejection of HR620 by Tammy Duckworth, a US senator from Illinois and a disabled veteran. Those signing the letter vowed against HR620 or other changes to the ADA.

Alongside online efforts for advocacy and education related to the HR620 bill, analyzed in this paper, some people with disabilities and disability advocates also took to protesting offline. Days ahead of the House vote on HR620, the Capitol Police arrested 10 individuals for unlawful demonstrations in the Capitol building [38]. Some more well-known, digital news outlets published coverage of the event including The Hill (Headline: Capitol Police arrest disability rights protesters for disrupting hearing), Vice News [33] (Headline: Protesters with disabilities were handcuffed and dragged out of a House committee meeting), and Business Insider [41] (Headline: Wheelchair-bound protesters dragged out of congressional hearing). Other coverage came from more niche and progressive news organizations like The Mighty [10], Truthout [36] and Not Dead Yet [12]. A Google search from January 15 to March 15, 2018 for news coverage of this protest, or others like it, yielded few results, however, suggesting these acts gained little visibility.

#### 4 DESCRIPTIVE ANALYSIS

Having established the historical context around the #HandsoffMyADA campaign, we now examine how Twitter attributes relate to the dissemination of the campaign message. We collect Twitter data related to the 2018 #HandsOffMyADA campaign and analyze them qualitatively to characterize the campaign in terms of hashtags, user groups, and tweet attributes.

##### Data Collection and Reduction

We collected a dataset of Twitter content between February 1st and March 3rd, 2018 using a scraping tool<sup>3</sup> via Twitter’s website. Relevant tweets contained one of the following hashtags associated with the campaign: #ada, #HandsOffMyADA, #HR620, #SaveTheADA, #StopHR620. This scraped data contained only the tweet text, Twitter user handle, and tweet ID, so we used Twitter’s public API to “rehydrate” these tweets and retrieve the associated metadata (retweet counts, user information, etc.). This initial dataset contained 63,463 tweets from 37,375 users.

After reviewing this initial dataset, however, many retrieved tweets were unrelated to the campaign against HR620; rather, many tweets contained references to a popular cryptocurrency, also called ADA, and discussions related to its value. To remove these unrelated references, we applied topic modeling, using latent Dirichlet allocation (LDA), to identify hashtags associated with the ADA cryptocurrency and removed any tweet mentioning one of 35 blacklisted tokens (e.g., #airdrop, #bitcoin, #ethereum, #usd, #xem). The resulting cleaned dataset contained 14,246 tweets from 6,522 users.

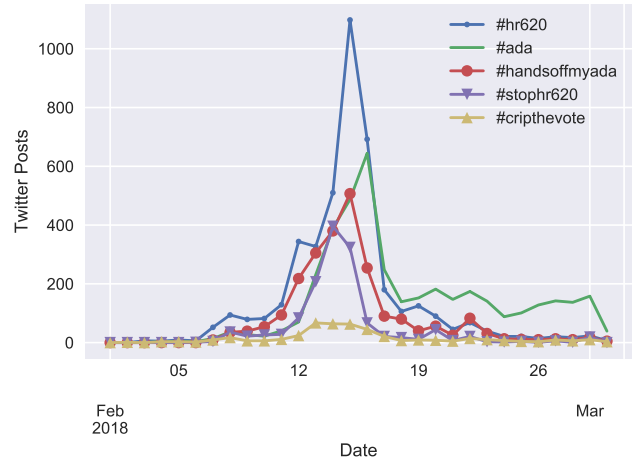


Figure 2: Daily frequencies of the top-5 hashtags during the campaign in the period of February 1st - March 3rd, 2018.

##### Hashtags

Since hashtags serve as major mechanism for coordinating communication channels and engaging in shared interests in Twitter [7], determining the most shared hashtags in the context of the campaign against HR620 helped in identifying discussions related to the movement. Unsurprisingly, the ten most used hashtags in our dataset contained the five search terms along with #CripTheVote, #NoHR620, #DisabilityRights, #Disability, and #CivilRights, with daily frequencies of the top five hashtags shown Figure 2. The discussions around these hashtags peaked between 14-16 February, centered on the day of the House’s vote on the bill (15 February) with tweets first appearing only a week before the vote. Of particular note is the #CripTheVote hashtag, given its use in the 2016 election, suggesting a continuity in messaging.

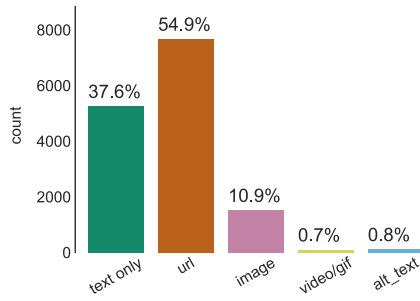
##### Users

We characterize users by analyzing their “bios”, a Twitter field in which users describe themselves in fewer than 160 characters, one that research has shown to be rich and predictive [39, 46]. We observe 5,792 users, or 88.8%, have included information in their bios, and we focus on the 5,432 users who provide bios in English, or 83.3% of the total users.

We manually inspect bios from users generating the 100 most retweeted tweets, and we observe the majority of these users fall into five *overlapping* categories also present in our historical analysis: *politician*, *organization*, *person with disabilities*, *advocate* (e.g., a family member of a person with disabilities), and *media*. If a user falls into multiple categories, we use their first mentioned identity for categorization (e.g., Senator Tammy Duckworth identifies herself as a senator

<sup>3</sup>TweetScraper: <https://github.com/jonbakerfish/TweetScraper>





**Figure 3: Tweet composition analysis indicates that very few tweets included media and even fewer accessible media.**

in her Twitter bio with no mention of her disability). To see how users are distributed along these categories, we manually code the bios of 549 users (a 10% random sample in our dataset), finding 1.3% of our sample are politicians, 18.2% organizations, 11.5% people with disabilities, 11.8% advocates, and 4.1% media. Bios for the remaining 53% of users in our sample do not include any explicit information or clues for this categorization.

We find many of the users with disabilities self-identify in their bios as “Disabled,” perhaps in response to the #SayTheWord campaign [30] that calls for the disability community to “own this word”. We observe an identity-first language in bios as well, such as “Deaf”, “Blind”, “Limbless”, “Autistic”, and “Wheelie”, as well as the disclosure of more specific information related to the disability such as “(Hearing-impaired, Learning Disability, & Auditory-processing disorder)”, “Broken build (Dysautonomia and EDS)”, “FSH dystrophy”, “Duchenne”, and “live with DID”.

### Tweet Features, Accessibility, and Engagement

Beyond hashtags, users, and user connectivity [2, 50], researchers have linked URLs, images and videos with retweetability [25, 49], which is considered a measure of success in activist tweets [42]. We explore these factors’ presence by examining the tweet composition in our dataset across the following non-disjoint categories: no media or URLs (text only), at least one URL (url), at least one image (image), and at least one video or animated GIF (video/gif).

Given that people with visual impairments are an active user group in Twitter [6, 39], we also examine the use of *alt text*, an alternative textual description of images provided by the author and accessible only through assistive technologies such as screen readers and refreshable Braille displays. Since our initial data obtained with TweetScraper was missing any alt text attributes, we re-scraped 13,986 of the original 14,246 tweets with Twitter’s API using the “twarc” program<sup>4</sup>. The

<sup>4</sup>Twitter archiving (twarc): <https://github.com/DocNow/twarc>

“my hand holding a green house of representatives gallery pass. on my wrist is a red mark from where handcuffs chafed my wrist” – self identified as a chronically ill disability activist.

“Hands Off My ADA” is in black, capitalized letters with a red hand print in the center of the “O” in Off. “Hands Off” is against a solid white background and “My ADA” is against a solid red background.” – self identified as an organization on disability rights.

**Table 2: Examples of alternative text describing images in tweets.**

remaining 260 tweets were unavailable and may have been deleted by their authors based on manual checking of the original URLs for a few of these tweets.

Figure 3 shows the distribution of the tweets in our dataset along these categories. We observe that about 38% of the tweets in this campaign are text only with the remaining 62% falling under the other overlapping categories. Specifically, more than 50% of the tweets include an URL (7, 672), almost 11% include an image (1, 518), less than 1% include a video (41) or an animated GIF (58), and less than 1% include an image with alt text. Specifically, we find that out of 1, 518 tweets embedding at least one image (1, 683 images) only 110 tweets (about 7%) have an alt text (118 images). On average, the description of these images, with examples shown in Table 2, tends to be very close to the 140 characters limit in tweets (range: 14-368,  $\mu$ : 143.80,  $\sigma$ : 100.90), thought the limit for alt text is 420 characters. Since there is currently no support for alt text in animated GIFs and videos, none of the 58 or 41 videos had an alternative text description.

When considering Twitter users who are Deaf/deaf or hard-of-hearing, we find that **only one of the videos in the campaign included captions**. Given that Twitter does not currently support closed captions or subtitles, the only way to add captions is to encode or “burn” them into the videos themselves making it even more challenging for users to upload video content that is accessible for this user group.

While no official numbers on alt text or video captioning compliance for Twitter are available, the **7% image accessibility rate** and **2.4% video accessibility rate** are strikingly low especially, when considering these tweets are generated by users who support disability rights and often also aim to reach people with disabilities (e.g. non accessible images in Figure 1). We suspect this scarcity is related to the fact that the ability to add alt text in Twitter is not ON by default. Moreover, many people may not even be aware of this feature since the alt text is not exposed in the interface and is only readable by viewing the source code of the tweet,

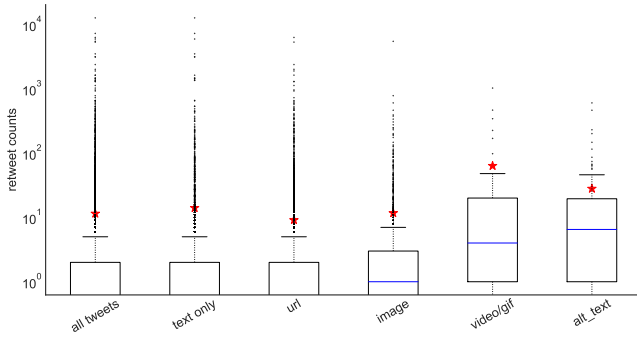


Figure 4: Retweet counts based on tweet composition.

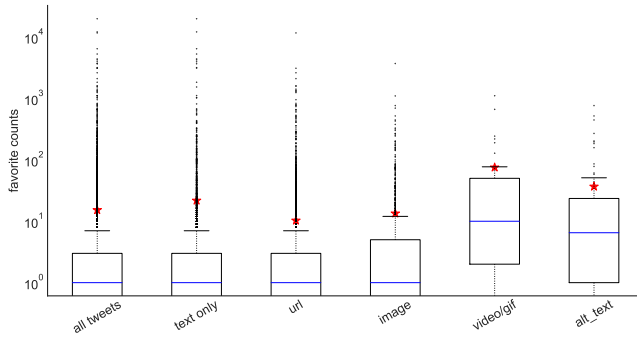


Figure 5: Favorite counts based on tweet composition.

using a screen reader, or a Twitter client applications such as EasyChirp [14] and the TheQube [51].

While the effect of URLs in retweetability is debatable, researchers tend to agree on the positive effect of media in retweetability [2, 19, 49, 50]. To see how these findings are reflected in our dataset, we plot the distribution of retweet count for tweets under each category in Figure 4, where box indicates quartiles, centerline indicates median, star indicates mean, whiskers indicate 1.5 inter-quartile ranges, and crosses indicate outliers. We also consider the number of times any tweet was marked as “favorite” by anyone, shown in Figure 5. Beyond indicating a measure of public endorsement, agreement, or support, these two behaviors, retweet and favorite, also serve as a mechanism through which information diffuses in Twitter.

We observe that most tweets in this campaign are neither retweeted nor marked as favorite. Specifically, the distribution of retweet and favorite counts indicates that a relatively small proportion of tweets are outliers with disproportionately large retweet or favorite counts. Of the 14,246 tweets in this dataset, each tweet is retweeted an average of 11.40 ( $\sigma = 173.7$ ) times and favorited an average of 15.08 ( $\sigma = 253.8$ ) times. Compared to the recent #MeToo Twitter

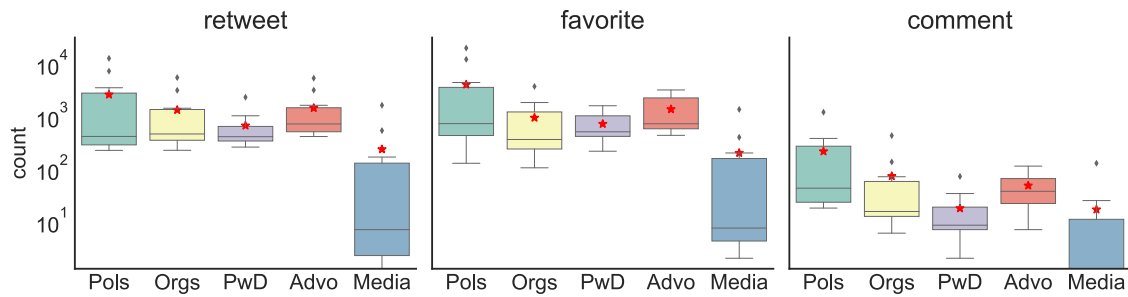
movement, these metrics are high, as the average #MeToo tweet posted between October 2017 to January 2018 received 2.38 retweets ( $\sigma = 71.79$ ) and 5.69 favorites ( $\sigma = 229.1$ ) [37]. The #MeToo campaign, however, has been highly influential, and this larger impact is apparent when we compare maximal values for these metrics: the most retweeted #MeToo tweet received 22,893 retweets, and the most favorited tweet received 104,464 favorites [37]; in comparison, tweets in our dataset reached a maximum of 12,732 retweets and 19,960 favorites. Furthermore, the #MeToo campaign garnered an order of magnitude more tweets in a similar timeframe, with 620,348 tweets from 205,489 users versus our 14,246 tweets from 6,522 users.

Looking at tweets with media, however, we see a different picture. Tweets with videos and animated GIFs receive more attention than any other type of tweet with mean retweet and favorite counts of 63 and 75, respectively. More interestingly, while tweets with images have mean retweet and favorite counts of 12 and 13, respectively, tweets of images with alt text receive substantially higher attention with mean retweet and favorite counts of 28 and 37. Thus, in agreement with previous studies [25, 49], there appears to be an association between the attention a tweet with an image receives, through retweets or favorites. Moreover, this association seems to carry on when tweets with images are made accessible. However, since there is no control for other factors (e.g. users, their connectivity, and the content) these results should be interpreted with caution.

## 5 QUALITATIVE ANALYSIS

To gain deeper insights into the major themes contained in the tweets and responses as well as how they differ across the observed user categories, we manually analyze a sample of 50 highly retweeted tweets and their comments using an open-coding method. Our sample consists of the most retweeted tweet from top-10 retweeted users for each of the five categories identified above: politicians, organizations, people with disabilities, advocates, and media.

*Politicians.* Many top tweets from politicians were used to voice the politician’s stance on the bill, share their dedication to “fighting for the rights” of people with disabilities. Senator Tammy Duckworth shared her personal experience as an individual with disabilities. Only one of the top tweets deployed a “call to action” message urging followers to call their representatives or take action. The most commonly used hashtags among the top ten tweets from politicians were #HR620 (6) and #HandsOffMyADA (4). Others included #ADA, #DisabilityRightsAreCivilRights and #StopHR620. Few multimedia elements were used in the tweets; one tweet included a link to a news article, one tweet included photos of the bill (no alt text), and another included a video of CSPAN footage (no captions). The majority of these top tweets were from



**Figure 6: Comparison of top-10 retweeted users across the five entities: politicians, organizations, people with disabilities, advocates, and media.**

current Congressional politicians. As shown in Figure 6, the average number of retweets for politicians' tweets was 2,590 ( $\sigma$ : 4,208) and the average number of favorites was 4,018 ( $\sigma$ : 6,691). The average number of replies to politicians' tweets in the dataset was 215 ( $\sigma$ : 371). In the replies, politicians were often thanked for their message and their advocacy around the issue. In the comments, users often brought up concerns for disabled veterans and veterans health issues.

*Organizations.* Many of the organizations tweeting were national-level organizations, like the Leadership Conference on Civil and Human Rights (@civilrightsorg), the American Civil Liberties Union (@ACLU) and the Americans Disabled Attendant Programs Today (@NationalADAPT). Tweets from these organizations focused initially on informing people about the upcoming vote on the bill, and after the bill was passed in the House, they tweeted about the vote results, their opposition to the bill and their disapproval of the politicians who voted in favor of the bill, with one tweet expressing a call to action for followers. The most commonly used hashtag in these tweets was #HR620 (8), followed by #StopHR620 (4) and #HandsOffMyADA (4). Four of the tweets linked to an article or website offering more information or commentary, one tweet included a video (open captions), and one tweet included an image (no alt text). The average number of tweets for these tweets from organizations was 1,322 ( $\sigma$ : 1,704) and the average number of favorites was 941 ( $\sigma$ : 1,126). The average number of replies to organizations' tweets in the dataset was 72 ( $\sigma$ : 131). Many of the replies to the organizations' tweets were from people with disabilities (or family members of people with disabilities) who shared their experiences and in some cases disclosed their disability. Most of the comments were proattitudinal, in that they agreed with the original tweet in thinking that the bill was harmful and those politicians who voted in favor of it should be condemned.

*People with disabilities.* Tweets from persons with disabilities were focused around advocating against the bill and educating others, voicing their concerns, and deploying calls

to action. Seven of the ten users self-identified as a person with a disability in their tweets. In the cases of the other three users, we looked to their Twitter bios and other tweets to determine their inclusion in this group. The most commonly used hashtags were #HandsOffMyADA (7) and #HR620 (7), followed by #StopHR620 (5). Three of the tweets linked to news articles, two included a photo (with alt text), and another included a video (no captions). The average number of retweets for these tweets was 667 ( $\sigma$ : 621) and the average number of favorites was 717 ( $\sigma$ : 468). The average number of replies to the tweets from people with disabilities in the dataset was 17 ( $\sigma$ : 21). There were not many replies to most of these tweets, however, comments generally involved the sharing of personal experiences from other people with disabilities. Another theme was showing disapproval of the bill and those who had voted in favor of it.

*Advocates.* Top tweets from advocates, labeled because of their perceived support for the disability community, centered around condemning lawmakers who voted in favor of the bill, sharing personal experiences of having a family member with a disability, and calls to action. The most common hashtag used in these tweets was #HR620 (7), followed by #ADA (2). Two of the tweets included links, one included a photo (no alt text), and one included a video (no captions). The average number of retweets for these tweets was 1,442 ( $\sigma$ : 1,593) and the average number of favorites on the advocates' tweets were 1,361 ( $\sigma$ : 1,134). These tweets averaged 48 replies ( $\sigma$ : 36). Replies to the tweets from advocates were very opposed to the bill and the lawmakers who voted in its favor. The replies in this grouping were also much more policy-oriented than in other replies. There was also less sharing of personal experiences and personal disclosure.

*Media.* Top tweets from media-affiliated accounts, focused on condemnation of the legislation and those who voted in favor of it, as well as multiple calls to action. The media accounts with top retweets were not mainstream news organizations or well-known journalists, but rather they were

smaller, independent organizations and lesser-known journalists. This may be because only tweets using hashtags related to ADA advocacy were pulled for analysis, which are hashtags mainstream news organizations may avoid using in their tweets. Within this grouping, the most common hashtag used was #HR620 (8), followed by #HandsOffMyADA (3) and #StopHR620 (2). Two of the tweets included links, but no other multimedia elements were included in these tweets. The average number of retweets was 236 ( $\sigma$ : 516) and the average number of favorites was 201 ( $\sigma$ : 425). The media group had the fewer number of replies with an average of 16.9 ( $\sigma$ : 39) replies per tweet, with many tweets receiving zero replies. For the four tweets in this grouping that did have replies, the commenters expressed disapproval of the bill and those lawmakers who voted in favor of it. There was some personal disclosure of disability. One commenter thanked a journalist for his coverage of the bill.

## 6 COMPARATIVE ANALYSIS

While the prior analyses center on #HandsOffMyADA in 2018, this section compares the disability community mobilized for this campaign versus prior initiatives through Twitter, specifically the #CripTheVote campaign in the 2016 US presidential election.

### Data Collection

While one could leverage the Twitter API to collect recent content, the #CripTheVote campaign in the 2016 US presidential election was too far in the past for Twitter’s API to support. To address this issue, this analysis relied instead on an extant archive of Twitter’s 1% Public Sample Stream. Twitter’s API stated this sample stream contained a 1%-random sample of tweets from the full Twitter network of public posts, and while this claim has been found lacking in certain respects, it has been shown to be adequate for analyzing popular content and interactions [40]. The archive leveraged here contains over 8.5 billion tweets between 1 January 2012 and 31 March 2018; for the purposes of this work, however, we focused only on tweets posted between 1 Sept. - 30 Nov. 2016 (3 months) and 1 Jan. - 31 March 2018 (3 months), containing 323, 636, 311 and 410, 805, 684 tweets, respectively.

Since the majority of the archive tweets were unrelated to the #CripTheVote and #HandsOffMyADA campaigns, the datasets were filtered to include only tweets referencing a relevant hashtag: #CripTheVote and #DisabilityRightsAreCivilRights for the 2016 campaign, and the same hashtags used above (#ada, #HandsOffMyADA, #HR620, #SaveTheADA, #StopHR620) for the 2018 campaign. Resulting datasets contained 482 tweets in 2016 and 14,880 in 2018 respectively. Again, the 2018 sample dataset included references to the ADA cryptocurrency, so we applied the same cryptocurrency

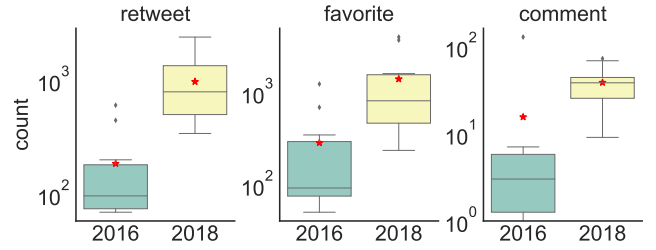


Figure 7: Top-10 retweeted tweets from #CripTheVote (2016) versus #HandsOffMyADA (2018) tweet samples.

filter described previously, resulting in 546 relevant tweets in 2018.

### Top-10 Retweeted Tweets Across Campaigns

We compare the top-10 retweeted tweets from the 2016 and 2018 sample datasets in term of the major themes that appeared in the tweets, use of hashtags, posters categories, and the responses they received, as shown in Figure 7.

In 2018, most of the top tweets were calls to action, urging people to make calls to representatives. The most common hashtags used were #ADA and hashtags related to the bill – #HR620 and #StopHR620. The majority of these tweets were from politicians, people with disabilities, and advocates, with only one tweet in this grouping being from an organization and none from media. These tweets averaged 966 retweets ( $\sigma$ : 640), 1388 favorites ( $\sigma$ : 1353), and 38 comments ( $\sigma$ : 20). However, in 2016, the most retweeted tweets around ADA advocacy were related to the presidential election and voting. Many of these tweets offered voting information to people with disabilities, some showed support or disapproval of candidates, and some were in reaction to the televised presidential debate. These tweets came from two groups only – advocates and people with disabilities – and all of the tweets used the #CripTheVote hashtag. These tweets averaged 184 retweets ( $\sigma$ : 185), 282 favorites ( $\sigma$ : 386), and 15 comments ( $\sigma$ : 39). We suspect that the lack of politicians tweets from the 2016 sample could partially explain the lower retweet, favorite, and comment counts since politicians tend to have a larger pool of followers.

### Influential Users and Communities

Interactions among users taking part in discussions around these campaigns yielded insight into the central and influential users to whom people turn to for information [8]. To identify influential users, we ranked users by their authority score as determined by the PageRank algorithm, a common method for ranking users in a network [11]. Creating clusters around these influential users also clarified which groups mobilize around which actors. Measuring influence



2016 - #CripTheVote		2018 - #HandsOffMyADA	
User	Centrality	User	Centrality
sfdirewolf	0.0505	morethanmysle	0.1271
andrewpulrang	0.0355	ghmansfield	0.0513
disvisibility	0.0291	mattbc	0.0188
hillaryclinton	0.0275	rebeccacokley	0.0178
greggberatan	0.0265	sfdirewolf	0.0142

**Table 3: Five most central users in the Twitter interaction network in the #CripTheVote and #HandsOffMyADA campaigns.**

and community required understanding the network among and connections between users within our datasets, leading us to construct a network of interactions between users. To build this network, we leveraged @-mentions in tweets (the @ symbol followed by a Twitter username), wherein a user mentions another user, such that nodes in the graph represent users and directed edges represent whether a user has mentioned another user.

After constructing these graphs and discarding isolated users who did not interact with others in the graph, we were left with 306 users in 2016 and 193 users in 2018. Central users in these interaction graphs for the 2016 and 2018 campaigns are shown in Table 3. Of these five most central users, Alice Wong (@sfdirewolf) was present in both campaigns and is the founder of the Disability Visibility Project (@disvisibility); similarly, Gregg Beratan (@greggberatan) and others were also present in both campaigns, for a total of 17 users. The majority of these central users were people with disabilities (6), advocates (6), and organizations (4). Only one of these users was a journalist, and none were politicians.

### Increases in Followership During the Campaigns

Another metric for a movement’s success is how popular the central accounts become during the campaign, which we can study in Twitter through a user’s counts of followers. We sample these counts by extracting them from tweet metadata stored in the 1% samples on which these datasets were built (i.e., whenever a user’s tweets or retweets are captured in the 1% sample, so too are that user’s friend and follower counts at that instant). For the top eight and 14 most central users in the 2016 and 2018 campaigns respectively, Figure 8 shows that follower gain during the three-month sampling periods, where the y-axis describes the number of tweets/retweets by a given user present in our datasets. We find in 2016, most of these central accounts saw larger increases in followership than central accounts in 2018, with four accounts from 2016 seeing increases of more than 600 followers, whereas only one account in 2018 saw a similar increase.

## 7 DISCUSSION

This study reveals several issues relevant to the human-computer interaction community, from strategies for building activist campaigns to the continued difficulty in using accessibility features to unique personal security concerns of those who self-disclose disabilities.

Twitter’s public, broadcast model and short, light messaging make it an ideal platform for individuals with disabilities to engage politically. We see in this study that Twitter is used by concerned parties, such as politicians, organizations, people with disabilities, advocates, and media to draw attention to the ADA Education and Reform Act. However, unless tweets receive enough attention, through retweets, favorites and comments, people are unlikely to learn about this bill and followup, thus limiting the efficacy of tweets. We find legislation targeting the ADA receives little attention when mentioned by media outlets that were not mainstream organizations. Moreover, in contrast to previous disability rights movements (e.g., in 1977 and 1990) mainstream news companies provided little coverage of the 2018 events. Mentions by politicians received far more attention emphasizing the need to engage politicians for increased communication. We also found that tweeting, with use of clear identifying hashtags peaked to above a 1,000 tweets a day on February 15, the day of voting. While many tweets were posted on the day of voting, substantially fewer tweets were posted in the time leading up to voting, suggesting campaigns using Twitter require longer time frames than allowed for this campaign.

When comparing this campaign (2018) to the #CripTheVote campaign (2016), we find tweets in 2018 received more attention. We suspect this difference may be due to the different themes from the two campaigns: while the 2016 campaign focused on providing information about voting and taking the personal action of voting, the 2018 campaign was a bigger call to action to raise awareness and influence politicians. We find key actors wielding greater influence in their social networks were present in both campaigns and were often people with disabilities, advocates, and disability organizations. This suggests tight communities are retained across the two campaigns. However, we find that such actors gained fewer followers in the 2018 campaign, which may result from the narrower area of concern that impacts only people with disabilities.

Positive relationships between multimedia and engagement are known [2, 19, 49, 50], and we find this relation in our results, particularly with tweets containing videos and accessible images. Moreover, we observe tweets with images that included an alt text received more retweets on average than tweets with solely images or just text. However, only about 11% of tweets related to the campaign had images, and only 7% of these were accessible. Given this

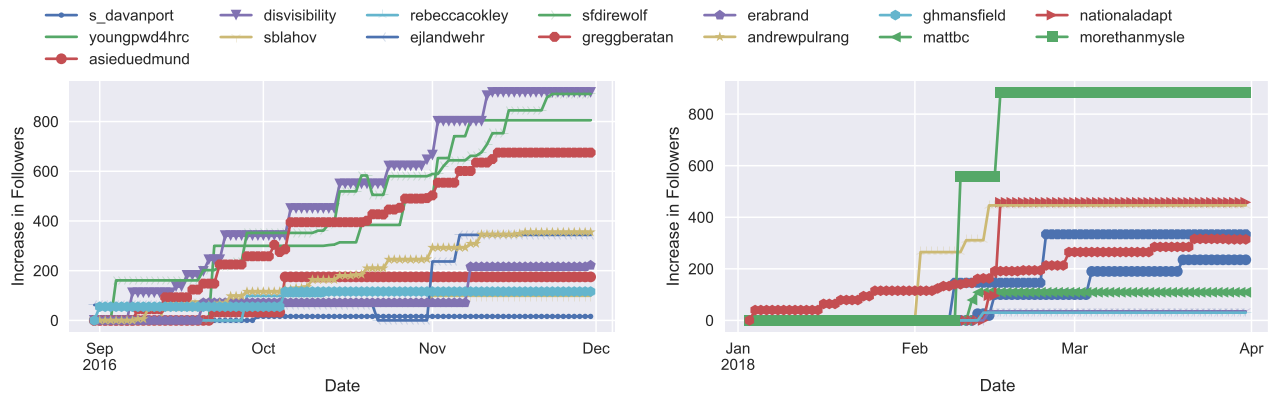


Figure 8: Followers for the top-8 and top-14 central users in the 2016 and 2018 campaigns during a three-month period.

campaign involves a community that cares about disability rights, this low use of alt text suggests few people are aware of accessibility attributes in Twitter and its use for increasing accessibility and communication. Tweets including video received more attention than any other content, yet fewer than 1% of tweets included video and only one of the videos included captions. Again, this highlights challenges for accessibility since uploading video with captions in Twitter currently requires additional effort, tools and knowledge.

Lastly, we find many users reveal information about their disability during political campaigns, often adopting an identity-first language or through selfies. While these strategies may increase effectiveness and draw attention, they also raises privacy concerns. These privacy concerns present an opportunity for technology to support these individuals and provide tools to remove these self-disclosures following a campaign, thereby preserving these individuals' privacy while allowing them to engage politically.

### Limitations

While the studies outlined herein identify issues both platforms and activists should address, several limitations in this work leave open future research avenues. One such limitation lies in our comparison of the #CripTheVote and #HandsOffMyADA movements: though engagement differs between these two movements, suggesting varying effectiveness, these differences may flow from divergent national contexts. The #CripTheVote campaign's focus on the 2016 presidential election connected with a national event with significant and long-term media coverage, whereas legislation the #HandsOffMyADA movement targeted was more isolated. As such, future comparisons of activism strategies would benefit from an equal comparison of legislative or election-related movements. Further, our studies of these movements focus only on relevant hashtags and the Twitter

platform, excluding content discussing the campaigns and engaging with the community through mentions or replies. Future work could follow individuals who are known activists in disability community and track their interactions, which could lead to better insights into why Twitter's accessibility features are so rarely used. Similarly, while our focus on Twitter is motivated by the disability community's use, individuals now engage across multiple platforms, and future research should explore this cross-platform content. Finally, when classifying users, we only consider disabilities disclosed through bios or tweets as they best represent how people self-identify on the platform and in this campaign. As such, we may have missed people who indeed have a disability but did not self-identify. Similar limitations apply to any study where the disability status is primarily based on self identification.

### 8 CONCLUSIONS

This multifaceted study provides a comprehensive analysis of how Twitter is adopted, used, and constrained for disability campaigns. We compared the current campaign to previous disability rights efforts and other campaigns on Twitter and identified differences and key network characteristics retained across both campaigns. We explored the use of hashtags, types of actors, use of multimedia, and themes of messages that contribute to increased sharing and communication of tweets that can lead to more successful campaigns. We also uncovered accessibility challenges that may limit people with disabilities from fully leveraging the potentials of Twitter in public discussions affecting their disability rights.

### ACKNOWLEDGMENTS

The authors would like to thank Joel Chan and the anonymous reviewers for their insightful comments on earlier drafts of this paper.

## REFERENCES

- [1] Jon B Alterman. 2011. The revolution will not be tweeted. *The Washington Quarterly* 34, 4 (2011), 103–116.
- [2] Peng Bao, Hua-Wei Shen, Wei Chen, and Xue-Qi Cheng. 2013. Cumulative effect in information diffusion: empirical study on a microblogging network. *PloS one* 8, 10 (2013), e76027.
- [3] Sharon N Barnartt and Richard K Scotch. 2001. *Disability protests: Contentious politics 1970-1999*. Gallaudet University Press.
- [4] Disha Bora, Hanlin Li, Sagar Salvi, and Erin Brady. 2017. ActVirtual: Making Public Activism Accessible. In *Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility*. ACM, 307–308.
- [5] Frank G Bowe. 1979. Handicapping America: Barriers to disabled people. In *J. P. Hourihan (ed.), Disability: Our challenge*. New York: Teachers College, 87–106.
- [6] Erin L Brady, Yu Zhong, Meredith Ringel Morris, and Jeffrey P Bigham. 2013. Investigating the appropriateness of social network question asking as a resource for blind users. In *Proceedings of the 2013 conference on Computer supported cooperative work*. ACM, 1225–1236.
- [7] Axel Bruns and Jean Burgess. 2012. RESEARCHING NEWS DISCUSSION ON TWITTER: New methodologies. *Journalism Studies* 13, 5-6 (2012), 801–814. <https://doi.org/10.1080/1461670X.2012.664428>
- [8] Cody Buntain, Jennifer Golbeck, Brooke Liu, and Gary LaFree. 2016. Evaluating Public Response to the Boston Marathon Bombing and Other Acts of Terrorism through Twitter. (2016). <http://www.aaai.org/ocs/index.php/ICWSM/ICWSM16/paper/view/13038>
- [9] Lucy Burke and Liz Crow. 2017. Bedding out: Art, activism, and Twitter. *Disability and Social Media: Global perspectives* (2017), 57–74.
- [10] Elizabeth Cassidy. 2018. Disability advocates protest new bill weakening Americans with Disabilities Act. Retrieved April 9, 2018 from <https://themighty.com/2018/02/disability-advocates-protest-h-r-620-/during-house-committee-meeting/>.
- [11] D. Chakrabarti and C. Faloutsos. 2012. *Graph Mining: Laws, Tools, and Case Studies*. Vol. 3. Morgan & Claypool Publishers. 1–207 pages. <https://doi.org/10.2200/S00449ED1V01Y201209DMK006>
- [12] Diane Coleman. 2018. Disability activists protesting HR 620 arrested for disrupting Congress. Retrieved April 9, 2018 from <http://notdeadyet.org/2018/02/disability-activists-protesting-hr-620-arrested-for-disrupting-congress.html>.
- [13] S. J. Cork, P. T. Jaeger, S. Jette, and S. Ebrahimoff. 2016. The politics of (dis)information: "Crippled America," the twenty-fifth anniversary of the Americans with Disabilities Act (ADA), and the 2016 United States presidential campaign. *International Journal of Information, Diversity, and Inclusion* (2016). <http://publish.lib.umd.edu/IJIDI/article/view/273>
- [14] EasyChirp. 2018. EasyChirp – A web-accessible alternative to the Twitter. Retrieved August 20, 2018 from <http://www.easychirp.com/>.
- [15] Katie Ellis and Mike Kent. 2016. *Disability and social media: Global perspectives*. Taylor & Francis.
- [16] Willingham Emily. 2016. This is what disability erasure looks like. Retrieved August 9, 2018 <http://www.forbes.com/sites/emilywillingham/2016/07/27/killer-of-disabled-people-in-japan-announced-his-intentions-months-ago/#1954b64c2942>.
- [17] Amber Ferguson. 2016. The #CripTheVote Movement Is Bringing Disability Rights To The 2016 Election. Retrieved August 20, 2018 from [https://www.huffingtonpost.com/entry/cripthevote-movement-2016-election\\_us\\_57279637e4b0f309baf177bd](https://www.huffingtonpost.com/entry/cripthevote-movement-2016-election_us_57279637e4b0f309baf177bd).
- [18] Doris Zames Fleischer and Frieda Zames. 2001. *The disability rights movement: From charity to confrontation*. Temple University Press.
- [19] Jenine K Harris, Adelina Mart, Sarah Moreland-Russell, and Charlene A Caburnay. 2015. Peer Reviewed: Diabetes Topics Associated With Engagement on Twitter. *Preventing chronic disease* 12 (2015).
- [20] Bronwyn Hemsley, Stephen Dann, Stuart Palmer, Meredith Allan, and Susan Balandin. 2015. "We definitely need an audience": experiences of Twitter, Twitter networks and tweet content in adults with severe communication disabilities who use augmentative and alternative communication (AAC). *Disability and Rehabilitation* 37, 17 (2015), 1531–1542. <https://doi.org/10.3109/09638288.2015.1045990> PMID: 26030339. arXiv:<https://doi.org/10.3109/09638288.2015.1045990>
- [21] Judith E. Heumann. 1979. Handicap and disability.. In *J. P. Hourihan (ed.), Disability: Our challenge*. New York: Teachers College, 7–32.
- [22] Scott Hollier. 2012. SociAbility: Social Media For People With A Disability. *Media Access Australia* (2012), 1–36.
- [23] Youyang Hou and Cliff Lampe. 2015. Social media effectiveness for public engagement: Example of small nonprofits. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*. ACM, 3107–3116.
- [24] Philip N Howard, Aiden Duffy, Deen Freelon, Muzammil M Hussain, Will Mari, and Marwa Maziad. 2011. Opening closed regimes: what was the role of social media during the Arab Spring? (2011).
- [25] Jue Huang and Jianxiong Xue. 2015. The Predictive Power of Content and Temporal Features of Posts in Information Dissemination in Microblogging. *Journal of China Tourism Research* 11, 2 (2015), 150–165.
- [26] Paul T Jaeger. 2018. Designing for diversity and designing for disability: New opportunities for libraries to expand their support and advocacy for people with disabilities. *The International Journal of Information, Diversity, & Inclusion* 2, 1/2 (2018).
- [27] Paul T Jaeger and Cynthia Ann Bowman. 2002. *Disability matters: Legal and pedagogical issues of disability in education*. Westport, CT: Bergin & Garvey/Praeger.
- [28] Paul T Jaeger and Cynthia Ann Bowman. 2005. Understanding Disability: Inclusion, Access. Westport, CT: Praeger (2005).
- [29] Cat Jones. 2015. Slacktivism and the social benefits of social video: Sharing a video to help a cause. *First Monday* 20, 5 (2015).
- [30] Barbara J. King. 2018. 'Disabled': Just #SayTheWord. Retrieved August 20, 2018 from <https://www.npr.org/sections/13.7/2016/02/25/468073722/disabled-just-saytheword>.
- [31] Hanlin Li, Disha Bora, Sagar Salvi, and Erin Brady. 2018. Slacktivists or Activists?: Identity Work in the Virtual Disability March. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '18)*. ACM, New York, NY, USA.
- [32] Hanlin Li and Erin Brady. 2016. #accessibilityFail: Categorizing Shared Photographs of Physical Accessibility Problems. In *Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility*. ACM, 277–278.
- [33] Alexa Liautaud. 2018. Protesters with disabilities were handcuffed and dragged out of a House committee meeting. Retrieved April 9, 2018 from [https://news.vice.com/en\\_us/article/zmwmda/protesters-with-disabilities-were-handcuffed-and-dragged-out-of-a-house-committee-meeting](https://news.vice.com/en_us/article/zmwmda/protesters-with-disabilities-were-handcuffed-and-dragged-out-of-a-house-committee-meeting).
- [34] Simon Lindgren. 2013. The potential and limitations of Twitter activism: Mapping the 2011 Libyan Uprising. *tripleC: Communication, Capitalism & Critique. Open Access Journal for a Global Sustainable Information Society* 11, 1 (2013), 207–220.
- [35] Paul K Longmore. 2003. *Why I burned my book and other essays on disability*. Temple University Press.
- [36] Mike Ludwig. 2018. Disability activists crash congress to stop a bill that would undermine their civil rights. Retrieved April 9, 2018 from <http://www.truth-out.org/news/item/43570-disability-activists-crash-congress-to-stop-a-bill-that-would-undermine-their-civil-rights>.

- [37] Lydia Manikonda, Ghazaleh Beigi, Subbarao Kambhampati, and Huan Liu. 2018. #metoo Through the Lens of Social Media. In *Social, Cultural, and Behavioral Modeling*, Robert Thomson, Christopher Dancy, Ayaz Hyder, and Halil Bisgin (Eds.). Springer International Publishing, Cham, 104–110.
- [38] Cristina Marcos. 2018. Capitol Police arrest disabled rights protestors for disrupting hearing. Retrieved April 9, 2018 from <http://thehill.com/homenews/house/373721-capitol-police-arrest-disability-rights-protesters-for-disrupting-hearing>.
- [39] Meredith Ringel Morris, Annuska Zolyomi, Catherine Yao, Sina Bahram, Jeffrey P Bigham, and Shaun K Kane. 2016. With most of it being pictures now, I rarely use it: Understanding Twitter’s Evolving Accessibility to Blind Users. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*. ACM, 5506–5516.
- [40] Fred Morstatter, Jürgen Pfeffer, Huan Liu, and Kathleen M Carley. 2013. Is the Sample Good Enough? Comparing Data from Twitter’s Streaming API with Twitter’s Firehose. In *ICWSM*.
- [41] Joe Perticone. 2018. Wheelchair-bound protesters dragged out of congressional hearing. Retrieved April 9, 2018 from <http://www.businessinsider.com/wheelchair-bound-protesters-dragged-out-of-congressional-hearing-2018-2>.
- [42] Amanda Potts, Will Simm, Jon Whittle, and Johann W Unger. 2014. Exploring “success” in digitally augmented activism: A triangulated approach to analyzing UK activist twitter use. *Discourse, context & media* 6 (2014), 65–76.
- [43] Andrew Pulrang, Gregg Beratan, and Alice Wong. 2016. Disability Advocacy and Twitter: Why Use it? Retrieved August 20, 2018 from <https://disabilityvisibilityproject.com/2016/05/07/disability-advocacy-and-twitter-why-use-it/>.
- [44] Dana Rotman, Sarah Vieweg, Sarita Yardi, Ed Chi, Jenny Preece, Ben Shneiderman, Peter Pirolli, and Tom Glaisyer. 2011. From slacktivism to activism: participatory culture in the age of social media. In *CHI’11 Extended Abstracts on Human Factors in Computing Systems*. ACM, 819–822.
- [45] Richard Scotch. 2009. *From good will to civil rights: Transforming federal disability policy*. Temple University Press.
- [46] Konstantinos Semertzidis, Evaggelia Pitoura, and Panayiotis Tsaparas. 2013. How people describe themselves on Twitter. In *Proceedings of the ACM SIGMOD Workshop on Databases and Social Networks*. ACM, 25–30.
- [47] Joseph Shapiro. 1994. Disability policy and the media: A stealth civil rights movement bypasses the press and defies conventional wisdom. *Policy Studies Journal* 22, 1 (1994), 123–132.
- [48] Joseph P Shapiro. 1993. No pity: People with disabilities forging new civil rights movement. *New York: Times Books* (1993).
- [49] Bongwon Suh, Lichan Hong, Peter Pirolli, and Ed H Chi. 2010. Want to be retweeted? large scale analytics on factors impacting retweet in twitter network. In *Social computing (socialcom), 2010 IEEE second international conference on*. IEEE, 177–184.
- [50] Jeannette Sutton, C Ben Gibson, Nolan Edward Phillips, Emma S Spiro, Cedar League, Britta Johnson, Sean M Fitzhugh, and Carter T Butts. 2015. A cross-hazard analysis of terse message retransmission on Twitter. *Proceedings of the National Academy of Sciences* 112, 48 (2015), 14793–14798.
- [51] TheQube. 2018. TheQube – An accessible social networking client. Retrieved August 20, 2018 from <http://theqube.oire.org/>.