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Using Knowledgeable Agents of the Digital and data feminism to uncover social identities in the #blackgirlmagic Twitter community

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ABSTRACT

Online spaces have the capacity to be powerful informal learning and identity development spaces for marginalized communities. However, there is still much work to be done to uncover these complex social identities using ethical big data analyses. In this study, I draw on the theory of Knowledgeable Agents of the Digital, data feminism, and critical reflexivity practices to engage with a #blackgirlmagic Twitter dataset from 2016 to 2019. Using Epistemic Network Analysis, findings suggest that the #blackgirlmagic community self-defined their social identities around Black beauty, academic/professional accomplishments, and social justice. Because the women and girls of #blackgirlmagic were agentive in rewriting and sharing narratives of themselves, they were acting as knowledgeable agents of the digital. These findings may be useful for (1) uncovering other instances of knowledgeable agents from non-dominant populations and how they navigate a racialized and gendered society, and (2) providing suggestions for analyzing online big data through an ethical, intersectional feminist lens.

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Introduction

Overview

Although social media has been shown to exploit human psychology, prioritize corporate interests, and reinforce discriminatory practices, such online spaces have the capacity to be powerful informal learning and identity development spaces for marginalized communities. One example is #blackgirlmagic, which began as a Twitter hashtag and became a social movement. After CaShawn Thompson created the hashtag in 2013, the #blackgirlmagic Twitter community became a representation of how Black girls and women cultivate digital spaces for celebrating each other, providing positive affirmations, and disrupting oppression. Studying digital spaces such as the #blackgirlmagic Twitter community provides stories of the lived racial and gendered experiences of Black women. Such stories inform curricular decisions, research, and policy reports to include the agentive nature of Black women's digital literacies and how they, and potentially other marginalized populations, navigate a racialized, gendered, and classist world (Lewis Ellison 2017).

However, studying digital spaces and analysing the large datasets that are collected from such spaces is a new research area and few resources exist to guide researchers in navigating ethical dilemmas in big data (Corple and Linabary 2020). False assumptions about big data as disembodied, placeless, and

deconceptualized contribute to misinformed scientific analyses. Even worse, these perceptions put marginalized populations further at risk by violating their privacy or replicating inequities in terms of obtaining data without regard for the population's goals, histories, and cultures (Mann 2014).

In this study, I discuss converging and conflicting narratives around #blackgirlmagic in academia and popular discourse. Then, I draw on the theory of *Knowledgeable Agents of the Digital* (Lewis Ellison 2017) to engage with a #blackgirlmagic Twitter dataset from 2016 to 2019 using the Epistemic Network Analysis tool (Marquart et al. 2019) and methods inspired by *critical reflexivity* (Corple and Linabary 2020) and *data feminism* (D'Ignazio and Klein 2020). My analysis focused on the social identities that emerged from the language used in tweets and how these identities provided further understanding of Black girls and women as agents of change in digital and non-digital contexts. My research question in this study was, what are the social identities that emerge from the language used in #blackgirlmagic tweets?

#Blackgirlmagic origins, influence, and contentions

The #blackgirlmagic Twitter community began in 2013 when CaShawn Thompson created the hashtag. Since then, over one million #blackgirlmagic tweets have been posted promoting positive images and achievements of Black women. Thompson explained that she was frustrated by the way Black women were negatively portrayed in the media and wanted to change the narrative (Flake 2017). In an interview with the *Los Angeles Times*, Thompson stated, 'I say "magic" because it's something that people don't always understand. Sometimes our accomplishments might seem to come out of thin air, because a lot of times, the only people supporting us are other black women' (Thomas 2015).

Although the intention of the hashtag was a positive one, conflicting narratives exist in academic and popular discourse. Chavers (2016) warned that the term 'magic' suggests that Black girls and women are something other than human and that the term is 'constricting, rather than freeing.' Chavers maintains that the term perpetuates oppressive images of a 'strong black woman archetype,' a stereotype that embodies false and harmful ideas such as that Black women feel less pain than others (Foster 2016). Similarly, Adams-Bass and Bentley-Edwards (2020) theorize Black Girl Magic as a coping mechanism for Black girls to navigate the complexities of racism and sexism as adolescents but caution that the public celebration of magic and the social media shorthand may diminish the challenging inequities that Black girls face.

In contrast, nine-year old Donato-Sapp (2020) published an article that contained a poem titled *Black Girl Magic is a Glorious Gift*. Her poem included the phrases 'You have Black Girl Magic and then some' and 'Knowing how to use Black Girl Magic is the difference between success and failure,' suggesting that 'magic' is one form of resilience for Black girls drawing on specific cultural knowledge. Donato-Sapp's poem also contains many action phrases such as 'Change the things you cannot accept,' 'Step up and say something,' and 'The march continues,' suggesting that 'magic' embodies Black girls as agents of change against oppressive structures. Similarly, Ladson-Billings (2017) argues that Black women 'are so much more than magic.' She claims that 'magic' is about Black women's abilities to 'feed families, keep roofs over their children's heads, and maintain dignity in the face of a society that despises them for both their race and their gender' (2). She describes the oppression Black women face:

> Magic is the ability to persevere despite being rendered invisible. Magic is setting your own standard of beauty while every representation of beauty displayed to you from the time you are a little girl is the antithesis of your skin color, your size, your hair texture, your nose, your lips, and your hips (3)

Toliver (2019) claims that the term 'magic' provides a lens for the flexibility and creativity needed to survive various oppressions. Similar to Afrofuturism ideas, 'magic' allows imagination around what could have been and could be, to embrace identity fluidity, and to challenge normativity. Taken altogether, the

current discourse suggests there is still much work to be done to uncover the complex social identities within the #blackgirlmagic digital space (Hay, Farrugia, and Smith 2018).

Social identity development and hashtag usage in digital spaces

Social identities are developed collectively from group membership (Tajfel 2010). On Twitter, long-term and sustained use of a hashtag is a way to develop a collective social identity in the digital world across time that can appeal to a population beyond those who use it (Gonzalez 2020). Konnelly (2015) claims hashtags are 'crucial arenas in which activists can foster reciprocal ties of solidarity and commitment, clarify their understandings of who they are, what they stand for, and who the opposition is.' The use of the hashtag allows users to initiate communication, self-direct the changing collective identity of the group, and promote the perspectives of those who are socially and politically marginalized (De Kosnik and Feldman 2019).

For example, hashtag usage on Twitter promotes Black voices and places a stronger focus on Black issues and perspectives (Duthely 2017). In the #blackgirlmagic community, Black girls and women are not only creating and projecting an ideological affiliation but are also discovering, communicating, and sharing ideas with other Black girls and with the public. Thus, the hashtag supports a space for social identity development but also a space in which Black girls and women are sharing and creating knowledge.

Black feminist thought and knowledgeable agents of the digital

Black feminist thought (Collins 2002) privileges Black women's knowledge and represents their experiences as relevant and meaningful against historic and modern oppression. Black feminist research explorations run counter to dominant, White male epistemologies and include core ideas around work, family, motherhood, sexuality, and political activism grounded in Black women's lived experiences. Moreover, Black feminist thought promotes self-definition and self-valuations by African American women through ongoing dialogue, action, and advocacy against oppression. This approach fights against deficit perspectives which assume that individuals have inherent intellectual, cultural, and behavioral deficiencies and ignore the unjust systemic conditions that (re)perpetuate inequities (Gorski 2011). This harmful research perspective reinforces hegemonic structures that privilege a single dominant way of existence. For example, a researcher with a deficit perspective asks questions such as, '*Why don't* Black women do x, y, and z?' In contrast, a Black feminist researcher asks questions such as, '*How* do Black women do x, y, and z?'

Lewis Ellison and Kirkland (2014, 2017) extend Collins's (2002) viewpoint to explore how Black women situate themselves in digital spaces that are fundamentally racialized and gendered. Lewis Ellison and Solomon (Lewis Ellison 2019; Lewis Ellison and Solomon 2019) embrace *counter-storytelling* as a way to explore and honor Black experiences in the digital world. Counter-stories stand in opposition to dominant stories of privilege, resist and challenge oppression and supremacy, and recognize marginalized voices. Specific to Black women's experiences in digital spaces, Lewis Ellison (2017) proposes the Knowledgeable Agents of the Digital framework and argues that Black women are agentive in rewriting narratives and images of themselves in digital and non-digital spaces. Her framework consists of seven components: embody self, disrupt oppression/inequities/injustices, possess power/advocacy, make meaning of lived experiences, create intersectional settings race/gender/class, foster agency, and reaffirm/self-define. This theoretical stance can be used to teach race and social justice from a non-deficit perspective and through Black women's digital literacies and experiences. However, in using this framework, Lewis Ellison recommends that educators and researchers be reflexive and think about their own perspectives, how their work matters to Black women, and how their work will shape the portrayal of Black women.

Applying intersectional feminist methodologies to online big data analytics

In recent years, feminist researchers have applied reflexive methodologies to online big data and social media datasets. The sheer amount of rich data captured in online digital spaces provide new insights into how people exist and interact. Morrow, Hawkins, and Kern (2015) argue that as the boundaries between online and offline environments continue to blur, face-to-face data collection is not inherently more authentic or valid than online data. However, new environments for learning and social interaction require a re-evaluation of how online data are collected, handled, and evaluated. For example, although many institutional review boards consider publicly available social media data as non-human subject data, researchers are questioning this conclusion as the data is inherently produced by and about humans (Zimmer 2010; Metcalf and Crawford 2016; Ravn, Barnwell, and Neves 2020).

In particular, Corple and Linabary (2020) reframe digital contexts as situated spaces that are constructed by a web of human bodies, materiality, and power structures. The researcher is a member of this situated web as they interact with the data created from others in a digital space. Through this interaction, the researcher constructs knowledge through their own lens and this knowledge is inherently situated within their intersecting identities of race, gender, class, and the research tools they choose to use. Corple and Linabary (2020) argue for researchers to acknowledge this situated and partial 'view from somewhere' (Haraway 1988) when conducting science and engage in *critical reflexivity* during big data analyses. Critical reflexivity involves 'interrogating the ethical decisions researchers make at each stage of the research process and laying them bare before others' (p 162). The authors suggest that researchers reflect on the accessibility of online data gathering and the embodied, situated nature of the participants embedded in the datasets. Some practical recommendations include documenting choices about what data are collected, why such data are necessary and ethical to collect, whether there was cleaning of the data and why, and what vulnerabilities the data may produce when analyzed, published, or combined with other data.

Relatedly, D'Ignazio and Klein (2020) present a *data feminism* approach to data science that calls for (1) attending to the oppressive inequities related to data science practices and (2) using data science practices to challenge and change such oppression for marginalized populations. Central to their framework is how categories of race, class, gender, sexuality, class, ability, ethnicity, age, geography, and other identities are interrelated and shape systems of privilege and oppression. This concept of *intersectionality* can be used as an analytic tool to understand social inequities through the interactions among various categories of power, as opposed to examining race or gender in isolation (Collins and Bilge 2020). Briefly, the role intersectionality plays in data feminism is to promote data scientist reflexivity in a way that challenges power dynamics and hierarchies, centers humanity and dignity, and breaks down traditional binaries to embrace pluralism and contextuality. This reflection should be made transparent and is one that is continually revisited before, during, and after the big data research project.

In practice, however, the reflexive process of making sense of human-produced online data is complex and riddled with tensions. For example, Patterson (2018) tells her story of analysing video data voluntarily posted by *YouTube* users and questioning her work along the way. She obtained publicly available *YouTube* videos to analyse the educational experiences of bi-racial youth. A main tension was that of not being able to speak to and build relationships with the participants in the same way as face-to-face research. Upon reflecting on whether it was ethical to continue the research, she noted, 'I had to make a decision about whether or not I was okay with the power dynamics as they were and with my attempts to disrupt them through adoption of a particular theoretical framework that influenced my methodological choices' (762). Although admittedly uncomfortable, Patterson found a way to balance her interests as a researcher with approaches that humanized her participants.

One technique that Patterson applied was to refer to her participants as *informants*. Although the *YouTube* users made their videos publicly available, they did not consent to participation in the study. Thus, the term informant was more fitting to the ways in which the users were engaged in the study. Another

creative practice that Patterson employed was to imagine interactions with her informants. Patterson described, 'I imagined my informants coming alive off of the computer screen and watching me as I paused and rewound their videos over and over … in a quest to add to my understanding of their perspectives' (762). Although she did not interact with her informants in a traditional manner, she interacted with their produced artifacts and engaged in practices that allowed the data to speak to her and for her to speak back to the data. Finally, in some ways, Patterson felt a higher level of intimacy with her informants than with previous participants. In online digital spaces, users may choose to share details that they may otherwise not share in an offline space, supporting conclusions by Morrow, Hawkins, and Kern (2015) that online spaces can be viewed as simultaneously public and private and that this dichotomy breaks down when critically reflecting on online big data analyses.

Methods

Study overview and research questions

In this study, I used critical reflexivity (Corple and Linabary 2020) and data feminism (D'Ignazio and Klein 2020) to analyse tweets from the #blackgirlmagic community. Because I had no face-to-face interaction with the authors of the tweets, I described them as informants in my study (Patterson 2018). My analysis was framed by Knowledgeable Agents of the Digital (Lewis Ellison 2017) as I explored how Black women were agentive in rewriting narratives and images of themselves in this digital space. My research question that guided this analysis was, what are the social identities that emerge from the language used in #blackgirlmagic tweets?

My positionality and relationship with the research

Rather than classify myself as an insider or an outsider to the participant group, I rethink the insider/outsider dichotomy as a continuum with multiple dimensions in which the researcher shifts depending on the context (Mercer 2007). In what follows, I describe my identities, ideologies, and experiences that shaped this research.

I am a 36-year-old, upper-middle class, cis-straight, Iranian American woman; I am not Black. I am a Twitter user and have been a follower of #blackgirlmagic for three years, but I have never posted using the hashtag. My choice to conduct this research was influenced by my identity as an Iranian American woman and child of immigrant parents. Although 'legally White,' Iranian Americans exist on the outer limit of whiteness as our names, languages, cultures, Islamic associations, and brown bodies are othered by European Americans and dominant populations (Maghbouleh 2017). Thus, I have experienced oppression and have felt like an ethno-racial outsider similar to the Black girls and women in this study; however, we are members of distinctive diasporas and have different oppressive histories and experiences.

As a woman in the male-dominated field of computational data sciences, I have experienced subtle and blatant sexism. In my career trajectory, I have had a limited number of mentors and models that fit my lifestyle as a woman and mother. Facing such personal adversities has made me more attune to the broader issues within data science, including unethical digital data collection, privacy violations, and algorithm bias and discrimination. Learning about such issues has motivated me to push forward scholarship in ethical data analyses and to promote how big data analyses can support and lift up those who are marginalized. I believe that acknowledging our positionalities, working through tensions, and engaging in reflexive practices facilitates the goal of practicing feminist data science (D'Ignazio and Klein 2020) through situated knowledge and a 'view from somewhere' (Haraway 1988).

Data collection and analysis

Using the Python programming language, I downloaded a package called Twint (Twintproject/Twint [2017] 2021), which allows for downloading tweets and other related information. I wrote a programming script to collect all tweets with the hashtag #blackgirlmagic from Twitter, which resulted in a dataset of 846,162 tweets from January 2014 to December 2019. The dataset contained the text of tweets, date, time, usernames, names, number of replies, number of likes, number of retweets, and geolocations. For this analysis, I chose to use tweets from 2016–2019 because these years had approximately 200,000 tweets each year and was when the hashtag gained significant popularity. Before 2016, the total number of tweets per year was less than 20,000 and did not affect the analysis. I cleaned the dataset by removing emojis and html tags from the text of the tweets. The final dataset totalled 808,790 tweets.

To analyse the tweets, I used a thematic analysis and a computational analysis. First, I read through the text of all the tweets and viewed a sample of the links and photos. Based on this initial reading, I determined a set of broad themes (Braun and Clarke 2006). These themes were patterns that were seen over and over again in the data and gave shape to the social identities developing in this Twitter community.

Then, using the R statistical programming language, I computed word frequencies, how often each word appears in the dataset. Then, I identified words that appeared at least 1000 times in the data and went back to the data to read the context of these frequently occurring words. Using R's tidytext package (Silge and Robinson 2016) I also computed a list of frequently occurring bigrams, which are pairs of words that appear together, and a topic analysis, which identifies groups of words that appear used together in the dataset. The bigram and topic analysis allowed me to explore how groups of words were used most often together in tweets.

Using both the computational analysis and thematic analysis, I determined a set of codes (Table 1) that appeared in the data. Because the dataset contained over 800,000 tweets, I created a list of keywords and keyphrases using regular expressions, a specified pattern that searches and matches words and phrases. I used this list to automate the coding scheme. Each tweet was tagged with one or more codes if a word or phrase matched the given list. I read random samples of tweets that were tagged for each code and revised as necessary to reach theoretical saturation. About 63% of the dataset was coded for the nine codes listed. Not all tweets were coded because (1) sometimes the hashtag was spammed with marketers or bots who posted multiple times, (2) many tweets contained images and limited text, and (3) the keywords and keyphrases were not exhaustive, and although I was thorough in my reading, there were undoubtedly some tweets that went unidentified.

Table 1. Coding scheme for #blackgirlmagic tweet texts with a subset of keywords or keyphrases that were used to automatically code the dataset. (Table view)

Code	Definition	Examples of keywords
Body and Hair	Referencing Black women's bodies and hair	*makeup, natural hair, melanin, dark skin, ebony, thick, fro*
Family	Identifying family members such as sisters or mothers. Also includes the use of 'sister' or 'fam,' which may not indicate a blood relationship but a cultural kinship	*mother, sister, aunt, ancestor*
Economics	Referencing black-owned businesses, entrepreneurship, or advertising a product	*buy black, marketing, business, girl boss*
Academic and Professional	Referencing an academic or professional endeavor or accomplishment	*college student, poet, singer, rapper, education, phd*
Heritage	Referencing Black heritage, for example referring to an African or Caribbean country or to a historic Black event	*africa, black art, nigeria, juneteenth*
Social Justice	Referencing injustice towards Black women and men. For example, referring to #blacklivesmatter or #metoo	*black lives matter, woke, feminist, racism*

Code	Definition	Examples of keywords
Media Figures	Referencing a popular Black woman figure in the media	*Beyonce, Issa Rae, Rihanna, Solange, Oprah*
Affirmation and Positivity	Words of affirmation, positivity, or celebration	*excited, fabulous, goddess, joy, flawless, yasss*
Power and Pride	Words of pride, power, or strength	*proud, strong, inspiration, strength, star*

After the dataset was coded for the nine codes, I computed the number of occurrences of each code in the entire dataset to compare the frequencies of all codes. Then, I used Epistemic Network Analysis (Arastoopour, Chesler, and Shaffer 2014; Arastoopour et al. 2016; Shaffer and Ruis 2017) to model the co-occurrences of the codes, which served as a proxy for developing complex social identities. Epistemic Network Analysis (ENA) measures the connections between codes by quantifying the co-occurrence of those codes within a defined stanza. Stanzas are collections of lines such that the lines within a stanza are assumed to be related. Once the size of a stanza is identified, for any two codes, their strength of association is computed based on the frequency of their co-occurrence within each stanza in the dataset. In this dataset, a line was identified as one tweet, and a stanza was identified as all the tweets by one user in one day. Each stanza was then modelled as a node-link network visualization in which the nodes represented the codes, and the weighted links represent how many times codes co-occurred together (See Arastoopour Irgens et al. 2020 for a mathematical explanation on how the weighted links are calculated). In this study, I accumulated all the stanzas together to create one network visualization that represented a summation of all the tweets in the dataset to measure the collective social identity of the users of the hashtag.

The ENA tool (Marquart et al. 2019) allows the researcher to visualize large sets of coded qualitative data to understand the relationships among the codes, not just examine the codes in isolation. Thicker links in the weighted network represent codes that co-occur often, and thinner links represent codes that co-occur less often. These networks reveal macro-level interpretations of the relationships among the coded data. At the same time, ENA provides a micro-level interpretation, as the researcher can identify which utterances contributed to the formation of that link. By viewing exactly where the discourse data contributes to the visualization, the researcher can 'close the interpretative loop' between the qualitative and quantitative approaches (Shaffer 2017). Because of this integrated approach, the researcher can reflect on discourse data in new ways and augment their analysis to tell participant stories that they could not tell before without the ENA visualizations (Arastoopour Irgens 2019).

Data Ethics and privacy

Because I did not have permission from the Black girls and women of #blackgirlmagic on how to use their tweets, I chose to not provide searchable information about the users, such as direct quotes or usernames. I did not want to put a vulnerable population further at risk for surveillance or harassment. Thus, to represent my findings without compromising the safety of my informants, I selected representative elements from all informants and composed a blended representation of the tweets. I employed Markham's (2012) method of creating *composite accounts* to convey my knowledge and analysis of the tweets while protecting the privacy and anonymity of the users of the #blackgirlmagic hashtag.

Results

Occurrences of codes over time

The most frequently occurring code in the tweets was *body and hair* occurring 258,410 times or in 32% of the tweets (Figure 1). This was closely followed by *affirmation and positivity* occurring 237,415 times or in 29% of the tweets. *Power and pride* occurred about half as often as *body and hair* and the remaining codes occurred in fewer than 100,000 tweets, which was less than 12% of the tweets.
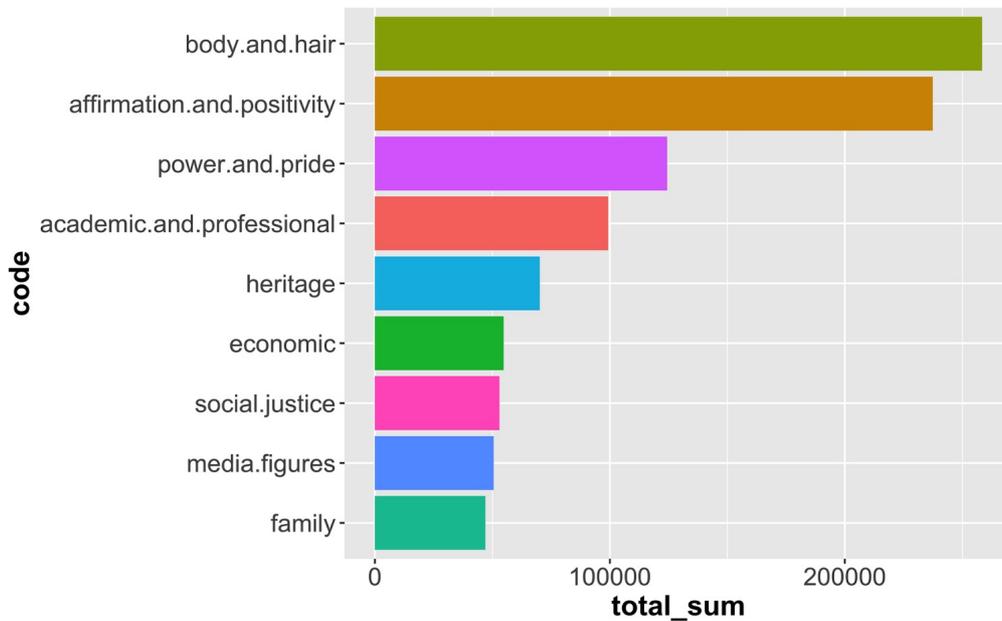

Figure 1. Total number of occurrences of each code within the dataset. Each code counted once per tweet.

Investigating social identities through the co-occurrences of codes

Although *body and hair* and *affirmation and positivity* were the most frequently occurring codes, the network analysis showed that the codes co-occurred together in different patterns. Three of these co-occurrences were the most prominent according to the qualitative and network analyses, and they occurred around bodies and hair, academic and professional accomplishments, and social justice.

Pride and love around physical appearances: co-occurrences with black bodies and hair

The top three strongest connections occurred among body and hair, affirmation and positivity, and power and pride (Figure 2). These tweets typically contained Black girls and women posting photos of themselves or of others. In fact, 70% of tweets that were coded for body and hair featured a photo uploaded to Twitter or linked to Instagram. These tweets generally featured a celebration of Black bodies with a focus on hair, skin, and clothing.
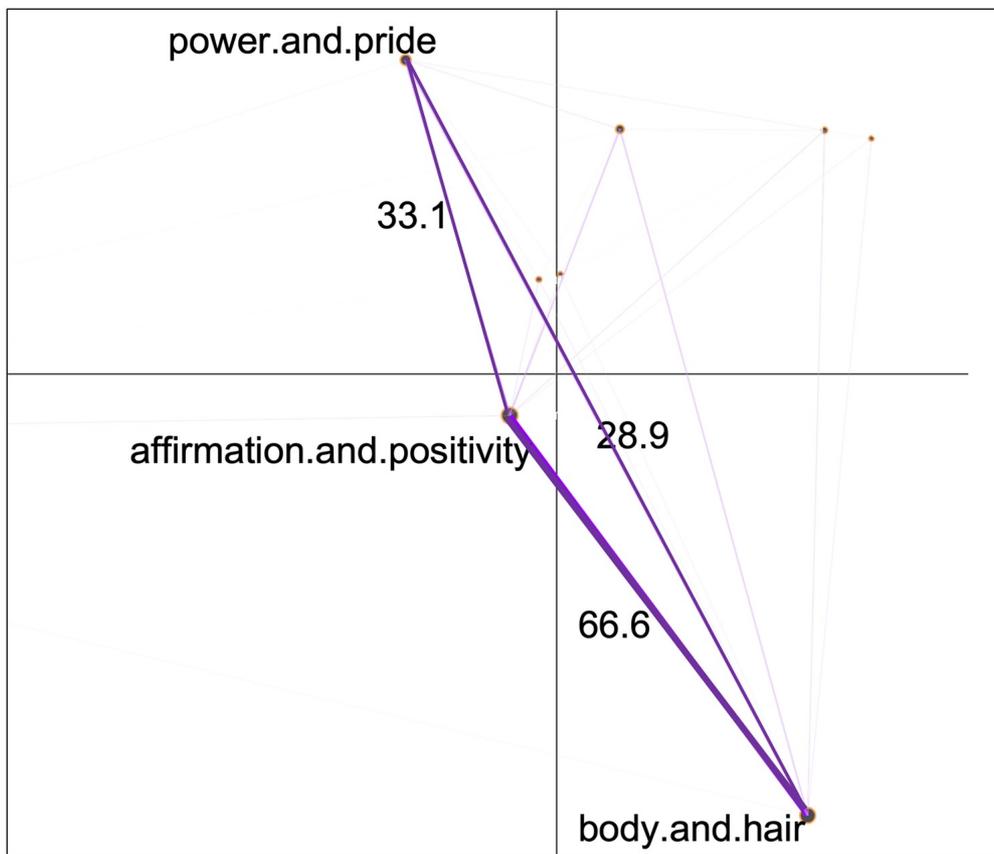
Figure 2. Average network across all four years of tweets highlighting the triangle among body and hair, affirmation and positivity, and power and pride. Numeric weights for the selected links are displayed and stronger links are visually represented with thicker and darker lines.

These three codes centered on celebrating particular aspects of Black women's bodies such as dark skin, Black hair and hairstyles, and African or African American cultural clothing. Tweets that celebrated Black beauty often featured a photo of the user with the hashtags #melanin or #melaninpoppin indicating a celebration of dark skin tones. These tweets also included the hashtag #natural or #naturalhair indicating the celebration of Black women's hair that is natural or untreated. For example, one tweet featured a photo of a Black woman in a traditional African headdress, earrings, and sandals with a celebratory message about her physical appearance.

Although the tweets celebrated Black hair, they also addressed some tensions related to dominant ideologies. Some users used the hashtag #BlackISBeautiful, emphasizing the 'is' in 'black is beautiful,' suggesting a counter-normative statement as if they were arguing with dominant ideologies around beauty. Similarly, other users celebrated their natural hair with pride and strength using hashtags such as #queen and #strongwomen, but at the same time acknowledged the struggle of natural hair being pitted against an impossible dominant standard of White beauty. These women admitted that as much as they feel strength in embracing their natural hair, they struggle with such ideas when faced with a dominant standard.

Thus, this first and most common social identification in the #blackgirlmagic Twitter community was *pride and love around physical appearances*.

Pride and love around accomplishments and roots: co-occurrences with academic and professional accomplishments

A second social identity centered on academic and professional accomplishments (Figure 3). The strongest connections to this code were again, body and hair, affirmation and positivity, and power and pride, but heritage also played a role in this collection.
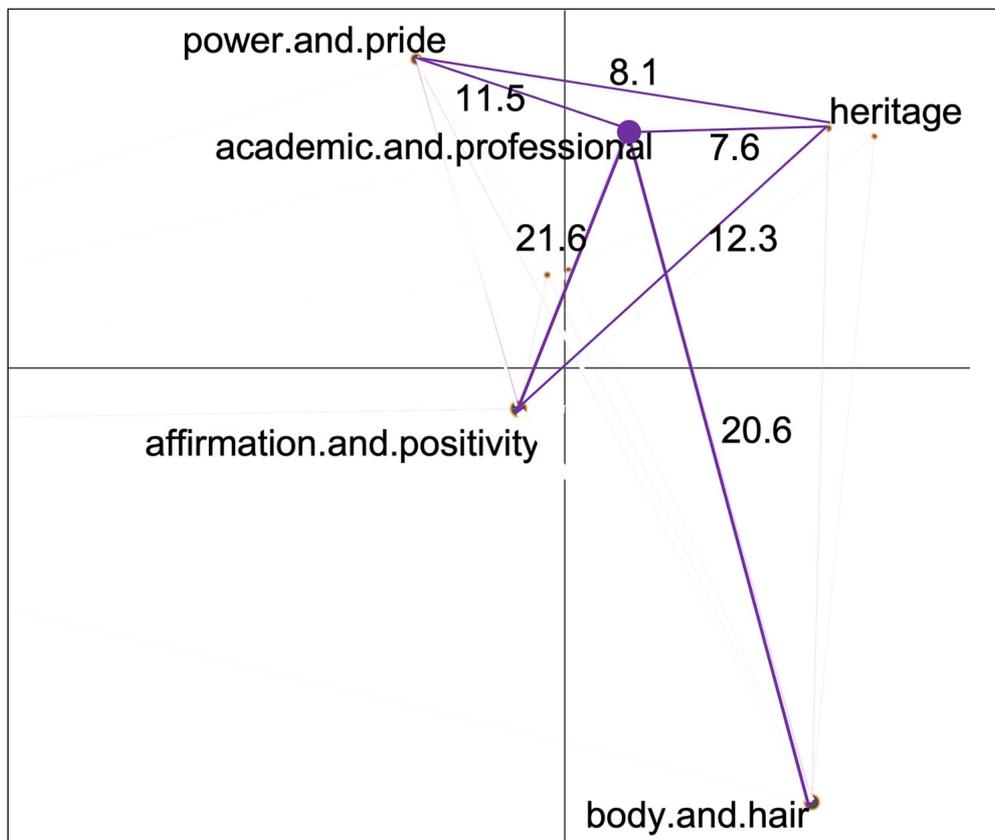
Figure 3. Average network across all four years of tweets highlighting connections to *academic and professional.* Numeric weights for the selected links are displayed and stronger links are visually represented with thicker and darker lines. A large dot is placed at the *academic and professional* node to highlight connections to this code.

These tweets promoted a Black woman's academic or professional success in addition to acknowledging beauty about their physical appearance. This reoccurring idea represented Black women as simultaneously intelligent, successful, and physically attractive. For example, one user tweeted about the success of a woman in engineering while also indicating she was a beautiful Black woman. Another user expressed her pride for both college graduation day and her natural curly hair that she styled to celebrate this particular milestone using the hashtag #proudofmyself.

Some users connected to Instagram to promote their fashion blogs, poetry collections, or fitness businesses that focused on Black beauty and heritage. For example, artists posted photos of their photography artwork, including self-portraits with stylized colors that proudly feature natural curls. These artists also celebrated their artwork in the form of painted sneakers, hats, and fashion prints inspired by Caribbean and African cultures. Hashtags associated with these tweets included #naturalhair, #blackqueen, #blackbusiness, and #artist.

Other artists posted modern portraits of Black girls. These artists used hashtags such as #blackgirlmagic and #drawingwhileblack. Other users who followed such artists provided positive feedback, commenting on the talent of the artists and also the beauty of the Black bodies highlighted in the artistic creations.

Thus, a second social identification in the #blackgirlmagic Twitter community was *pride and love around accomplishments and roots*, revealing academic and professional successes grounded in pride, love, and African heritage.

Fighting racial/gender oppression and celebrating advocacy: co-occurrences with social justice

In addition to being a space to celebrate Black women's beauty and accomplishments communally and publicly, the #blackgirlmagic community was also a space in which Black women confronted oppressive paradigms. The co-occurrences that supported the disruption of oppression were between social justice,

body and hair, affirmation and positivity, power and pride, academic and professional, and heritage (Figure 4).
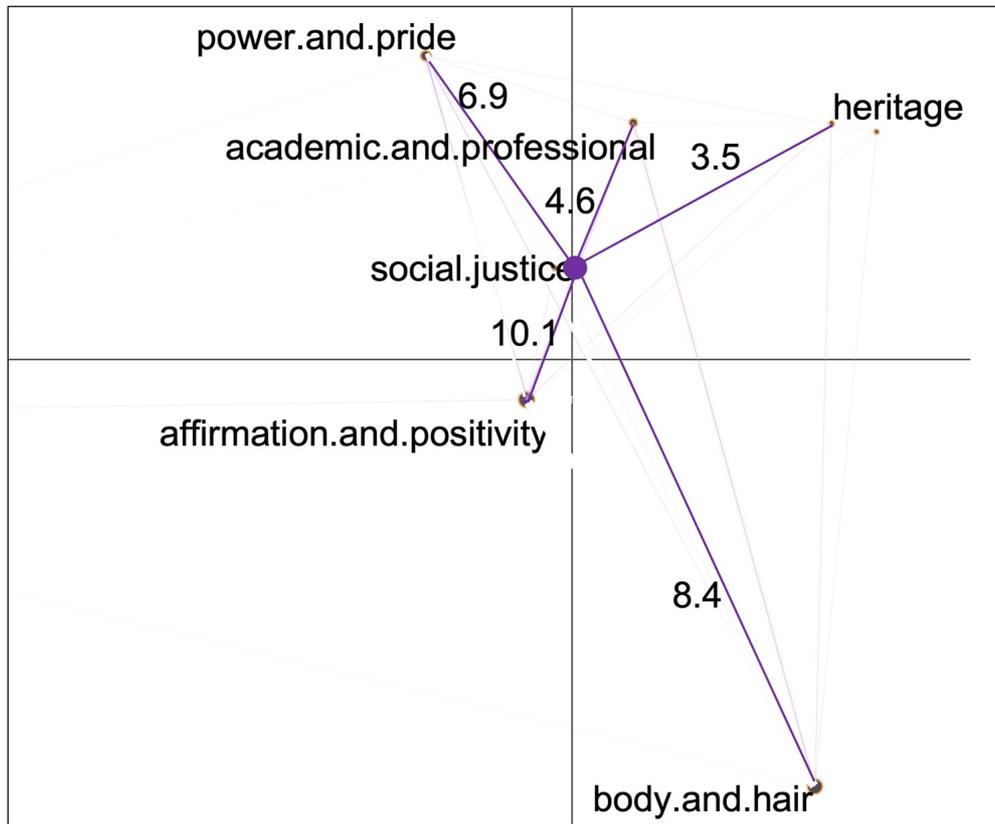

Figure 4. Average network across all four years of tweets highlighting connections around social justice. Numeric weights for the selected links are displayed and stronger links are visually represented with thicker and darker lines. A large dot is placed at the social justice node to highlight connections to this code.

Such tweets centered on drawing attention to the discrimination and racism that Black women face in various contexts. Some users posted videos of spoken word poetry. Confidently using African American vernacular, these artists criticized popular negative conceptions of Black women and promoted Black women's physical beauty and professional accomplishments.

Tweets in this category also supported Black Lives Matter movements and protests about violent attacks against Black people in the U.S. The tweets that used #blacklivesmatter and #blackgirlmagic included descriptions of Black girls and women's mistreatment in historic and recent contexts. Examples included the Sixteenth Street Baptist Church Bombing that took place on September 15, 1963, in which four young Black girls were killed, and the killing of Breonna Taylor on March 13, 2020. Some users quoted famous Black rights advocates, such as the protest chant attributed to activist Assata Shakur: 'We have nothing to lose but our chains.' This quote was likely used to reference the chains that Black people historically were forced to wear in times of slavery and the metaphorical chains that Black people currently wear in terms of modern forms of oppression.

Some tweets expressed frustration around culture appropriation. Users suggested that White people in the entertainment business appropriate and profit from Black culture without acknowledging historic significance. Others specifically referenced the appropriation of Black hair by White woman. These users made statements similar to the sentiment, 'everybody wanting to be Black until it's time to be Black.' According to many users, statements such as these refer to White women claiming Black hair, clothes, music, and culture but not having to experience the lack of privileges that Black women have such as, being

discriminated in the workplace for the same hairstyles, being paid less than White women, and being harassed by police.

Other tweets around social justice were linked to positivity and celebrated women who engage in activism for the Black community, such as criminal justice reform. Some users celebrated the Black Lives Matter and linked the movement explicitly to #blackgirlmagic indicating how the movement has inspired their daughters and other family members.

Thus, this last social identification in the #blackgirlmagic Twitter community was *fighting racial/gender oppression and celebrating advocacy*, expressing sadness, anger, and frustrations but also celebrating advocacy and fighting against oppression collectively.

Discussion

#Blackgirlmagic as a digital space for complex social identities

By applying a data feminist approach to analysing #blackgirlmagic tweets, I developed nine codes and visualized the co-occurrences of codes to uncover social identities. The most frequently occurring co-occurrences were among Black women's bodies and hair, affirmations, and pride, revealing a social identity of *pride and love around physical appearances*. These tweets celebrated Black women's natural textured hair and dark skin, which historically have been othered and pitted against a hegemonic and institutionalized standard of White beauty (Collins 2002). Although these tweets about body and hair were highly positive, they also included tensions and uncertainties. Another pattern focused on Black women's academic and professional achievements, revealing a social identity of *pride and love around accomplishments and roots*. This social identity speaks to the multiplicity of how Black women see themselves in this space: as academically talented, professional successful, physically beautiful, and ethnically diverse. The last pattern of co-occurrences revealed a social identity of *fighting racial/gender oppression and celebrating advocacy*. Although these social justice tweets were connected to positivity and pride around advocacy, they were also connected to the dark and twisted history of slavery in the U.S. and ongoing oppression for Black girl and women. Taken together, these three prominent patterns reveal the highly positive and affirmative take on Black women's lived experiences but also their existing tensions, uncertainties, and adversities.

Although scholars have argued that the term 'magic' limits Black girls in expressing their challenges (Chavers 2016; Adams-Bass and Bentley-Edwards 2020), in the context of the #blackgirlmagic Twitter community, magic embraced the good and the bad in these girls' lived experiences. Magic was the ability for Black girls to set their own standard of beauty that goes against the dominant standard and to take action to create counter-narratives despite being rendered invisible (Ladson-Billings 2017). Magic was used to provide the flexibility and imagination needed for surviving and persevering oppression (Toliver 2019) by engaging in creative forms of expressing feelings around and combating racial injustice. In other words, Black girls and women co-created a complex digital space around the term #blackgirlmagic that simultaneously embraced positive messaging and affirmation, as well as uncertainties, sadness, anger, and frustrations in the face of oppression.

Of course, these claims are not about all Black girls and certainly not about each individual Black girl in this Twitter community. Rather, these claims are about the collective social identities that the members of this hashtag community have declared to the public, which defy and challenge oppressive paradigms (Konnelly 2015; De Kosnik and Feldman 2019; Gonzalez 2020).

The girls and women of #blackgirlmagic as knowledgeable agents of the digital

Using a popular social media space, the girls and women of #blackgirlmagic came together to publicly display multiple, self-defined social identities. They drew from their own lived experiences and were

agentive in rewriting narratives and images of themselves, engaging in sensemaking of their lives as knowledgeable digital agents (Lewis Ellison 2017).

In this study, there was evidence of all seven components of the Knowledge Agents of the Digital framework. At a holistic level, the girls and women of #blackgirlmagic created a collective *intersectional gender/race/class* digital space and shaped it to meet their needs and desires. In this sense, the members of this hashtag community *fostered agency* to publicly self-define themselves to the rest of the world. The tweets revealed the ways in which their Blackness, femaleness, and socio-economic classes shaped their *lived experiences* as mothers, sisters, students, business owners, artists, activists, and more. And in some tweets, they drew on and shared their experiences in more than one of these roles.

The findings also highlighted the relationship between Black girls' hair, affirmations, and pride. Such tweets revealed how Black girls *embody the self,* posting photos of themselves and their friends and families, focusing on celebrating Black hair, skin, and clothing, but also at times expressing uncertainties and frustrations around dominant beauty standards. The tweets also revealed public displays of *reaffirming/self-defining* their digital and nondigital roles through posted artifacts and responses to each other's work. For example, some artists engaged with Twitter followers about their portraits of Black girls, showing how their artwork has been reformulated and has evolved over time. Moreover, the #blackgirlmagic Twitter community was a space where Black girls *possessed power/advocacy* and *disrupted oppression/inequities/injustices*. The Black girls who disrupted such oppression did so by referencing historic and current contexts of racism and sexism. For example, some tweets expressed frustration around Black bodies and hair being subjugated and appropriated by White people in positions of power. However, some tweets were linked to positivity and celebrated women who engaged in activism in Black communities, providing hope for those fighting for freedom.

Thus, this analysis suggests that #blackgirlmagic embodied the components of the Knowledgeable Agents of the Digital (Lewis Ellison 2017). This study contributes to a broader and nuanced understanding of being a knowledgeable agent in a racialized and gendered society, which may be a useful lens for analysing other non-dominant populations.

Reflections on taking a feminist lens to online big data analysis

Taking a feminist methodologies approach in this work required dismantling traditional dichotomies (Lykke 2010) such as public/private, domination/subordination, discursive/material, human/non-human, insider/outsider, and researcher/participant. One dichotomy that I encountered was human versus non-human. In the initial stages of this study, I discovered that my institution considers the collection of publicly available Twitter data as a non-human subjects study. I did not need to ask permission from nor notify the Twitter users that I would be analysing and publishing their public posts. However, I felt uneasy that my informants did not know that I downloaded and analyzed their data and that they were not involved or notified of this process. Through my ethical reflections and commitments, I decided to not publish any usernames or provide direct quotations that could put my informants at risk. I realized that publicly available data is not equivalent to openly sharable data.

Another dichotomy I encountered was private versus public. By viewing my participants as informants (Patterson 2018), I created an imagined conversation with them to understand their stories as much as possible, given the one-sided nature of the conversation. When I selected coded examples of tweets, I followed that person's timeline and profile to situate the tweet. Situating the tweet in a broader context of a user's profile helped me define and redefine the final set of codes. Moreover, I contemplated the power dynamics that existed as I filtered my informants' experiences through my chosen theoretical frameworks and methodologies without giving them an opportunity to validate my findings. Through these methodological choices, I viewed my informants as people, not as research subjects. Because my informants

did not consent to their information being used in this particular venue of publication, I made ethical commitments to protect their privacy and dignity, not make specific claims about individuals in this space, and represent the community as holistically and respectfully as possible.

The last dichotomy addressed in this study was insider versus outsider. During the research process, I reflected on my position along the insider/outsider spectrum across space and time. As a follower of the hashtag, I experienced and understood aspects of the #blackgirlmagic community. As a non-Black person and non-poster of the hashtag, there were aspects that were not relatable to my lived experiences and at times, I felt like an outsider and invisible 'lurker' (Morrow, Hawkins, and Kern 2015). Through critical reflection as a feminist data scientist, I chose to ground this work in Black feminist thought theories and methodologies while understanding my perspective advantages (Ladson-Billings 2000) as a non-White woman, the limitations of my Whiteness as an Iranian-American woman (Maghbouleh 2017), and my outsiderness as a non-Black woman.

When engaging in critical reflexivity, I realized that the ethical and personal tensions that I acknowledged and sat with during the research process were a fundamental aspect of analysing online big data through an intersectional feminist lens. As complications increased, I came close to abandoning this work altogether. However, through further contemplation and feedback, I viewed the complications as opportunities to contribute to scholarship on ethical analysis of interactive online digital spaces and to provide new forms of counter-storytelling (Lewis Ellison and Solomon 2019) using big data. In this analysis, I used an integrated qualitative/quantitative data analysis approach that allows us to privilege those voices that are not often heard (Arastoopour Irgens 2019). My use of a data feminism lens in conjunction with the ENA tool for visualizing discourse allows for a form of data science counter-storytelling that moves away from a deficit perspective in education.

I have presented one approach here, but more work is needed to explore alternative ethical approaches to online big data analysis. The easily accessible, seemly public datasets that researchers obtain can be traced back to humans. Without paying attention to the individuals who make up our datasets, we may cause harm to vulnerable populations who are harassed or under surveillance in online spaces. And without a humanistic lens, researchers may perpetuate biased or discriminatory views about the people in their datasets. Thus, in order to conduct online big data research with dignity and humanity, researchers cannot disconnect themselves from the people who live within our obtained datasets. We must be transparent about our choices in online big data research and explicit about the implications of such choices in our shared work in order to promote forms of good and to minimize harm.

Conclusion

The #blackgirlmagic hashtag is an example of how online communities have the capacity to be powerful learning and identity development spaces for marginalized populations. Through a data feminism approach informed by intersectionality, the process of analysing data from this community required critical reflexivity. A data feminism approach meant dismantling traditional dichotomies in big data research, sitting with tensions and discomforts, and centering ethical, political, and relational commitments to our researched populations. Using these approaches, the analysis in this study showed that the #blackgirlmagic community promoted self-defined, complex social identities around Black beauty, academic/professional accomplishments, and social justice. Because the women and girls of #blackgirlmagic were agentive in rewriting and sharing narratives and images of themselves, they were examples of knowledgeable agents of the digital. This study contributes to a broader and nuanced understanding of being in a racialized and gendered online and offline world.

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References

Adams-Bass, Valerie N., and Keisha L. Bentley-Edwards. 2020. "The Trouble With Black Girl Magic for Black Girls." In *Strong Black Girls: Reclaiming Schools in Their Own Image*, edited by Danielle Apugo, Lynnette Mawhinney, and Afiya Mbilishaka. New York: Teachers College Press.

Arastoopour, Golnaz, Naomi C. Chesler, and David Williamson Shaffer. 2014. "Epistemic Persistence: A Simulation-Based Approach to Increasing Participation of Women in Engineering." *Journal of Women and Minorities in Science and Engineering* 20 (3).

Arastoopour, Golnaz, David Williamson Shaffer, Zachari Swiecki, A. R. Ruis, and Naomi C. Chesler. 2016. "Teaching and Assessing Engineering Design Thinking with Virtual Internships and Epistemic Network Analysis." *International Journal of Engineering Education* 32 (2).

Arastoopour Irgens, Golnaz. 2019. "Quantitative Ethnography Across Domains: Where We Are and Where We Are Going." Keynote presented at the International Conference for Quantitative Ethnography, Madison, WI, October. https://mediaspace.wisc.edu/media/1_wc2vypki.

Arastoopour Irgens, Golnaz, Sugat Dabholkar, Connor Bain, Philip Woods, Kevin Hall, Hillary Swanson, Michael Horn, and Uri Wilensky. 2020. "Modeling and Measuring High School Students' Computational Thinking Practices in Science." *Journal of Science Education and Technology* 29 (1): 137–161.

Braun, Virginia, and Victoria Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3 (2): 77–101.

Chavers, Linda. 2016. "Here's My Problem With #BlackGirlMagic." ELLE. January 13, 2016. https://www.elle.com/life-love/a33180/why-i-dont-love-blackgirlmagic/.

Collins, Patricia Hill. 2002. *Black Feminist Thought: Knowledge, Consciousness, and the Politics of Empowerment*. New York, NY: Routledge.

Collins, Patricia Hill, and Sirma Bilge. 2020. *Intersectionality*. Second Edition. Cambridge, UK: John Wiley & Sons.

Corple, Danielle J., and Jasmine R. Linabary. 2020. "From Data Points to People: Feminist Situated Ethics in Online Big Data Research." *International Journal of Social Research Methodology* 23 (2): 155–168.

De Kosnik, Abigail, and Keith P. Feldman. 2019. "Introduction: The Hashtags We've Been Forced to Remember." In *#Identity*, edited by Abigail De Kosnik, and Keith P. Feldman, 1–19. Hashtagging Race, Gender, Sexuality, and Nation. University of Michigan Press. https://www.jstor.org/stable/j.ctvndv9md.4.

D'Ignazio, Catherine, and Lauren F. Klein. 2020. *Data Feminism*. Cambridge, Massachusetts: The MIT Press.

Donato-Sapp, Helena. 2020. "Black Girl Magic Is a Glorious Gift." In *Strong Black Girls: Reclaiming Schools in Their Own Image*, edited by Danielle Apugo, Lynnette Mawhinney, and Afiya Mbilishaka. New York: Teachers College Press.

Duthely, Regina. 2017. "Black Feminist Hip-Hop Rhetorics and the Digital Public Sphere." *Changing English* 24 (2): 202–212.

Flake, Ebony. 2017. "As #BlackGirlMagic Turns Four Years Old, CaShawn Thompson Has A Fresh Word For All The Magical Black Girls." Blavity News & Politics. August 19, 2017. https://blavity.com/as-blackgirlmagic-turns-four-

years-old-cashawn-thompson-has-a-fresh-word-for-all-the-magical-black-girls.

Foster, Kimberly. 2016. "Dr. Linda Chavers on #BlackGirlMagic and the Article That Started a Firestorm - For Harriet | Celebrating the Fullness of Black Womanhood." *For Harriet*, January 15, 2016. http://www.forharriet.com/2016/01/dr-linda-chavers-on-blackgirlmagic-and.html.

Gonzalez, Victoria M. 2020. "Where Is the 'We' in Online Social Movements?: Rethinking the Role of Collective Identity in Online Activism." Ph.D., United States – New Jersey: Rutgers The State University of New Jersey, School of Graduate Studies. https://search.proquest.com/docview/2426123272/abstract/3FCE0E6EE01E4AE6PQ/1.

Gorski, Paul C. 2011. "Unlearning Deficit Ideology and the Scornful Gaze: Thoughts on Authenticating the Class Discourse in Education." *Counterpoints* 402: 152–173.

Haraway, Donna. 1988. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14 (3): 575–599.

Hay, Kellie, Rebekah Farrugia, and Deidre Smith. 2018. "D.S. Sense's "On My Detroit Everything": Self-Articulating Black Girl Magic." *Arts* 7 (2): 17.

Konnelly, Alexah. 2015. "#Activism: Identity, Affiliation, and Political Discourse-Making on Twitter." *The Arbutus Review* 6 (1): 1–16.

Ladson-Billings, Gloria. 2000. "Racialized Discourses and Ethnic Epistemologies." In *Handbook of Qualitative Research*, edited by Norman K. Denzin, and Yvonna S. Lincoln. 2nd ed. Thousand Oaks, Calif: Sage Publications.

Ladson-Billings, Gloria. 2017. "Black Girls Are More Than Magic." *Bank Street Occasional Paper Series* 2017 (38): 6.

Lewis Ellison, Tisha. 2017. "Integrating and Humanizing Knowledgeable Agents of the Digital and Black Feminist Thought in Digital Literacy Research." In *Handbook of Writing, Literacies, and Education in Digital Cultures*, edited by Kathy A. Mills, Amy Stornaiuolo, Anna Smith, and Pandya Jessica Zacher, 88–98. 1st ed. Routledge.

Lewis Ellison, Tisha. 2019. "The Matter of Parents' Stories: Urban African American Mothers' Counter-Stories About the Common Core State Standards and Quality Teaching." *Urban Education* 54 (10): 1431–1461.

Lewis Ellison, Tisha, and David E. Kirkland. 2014. "Motherboards, Microphones and Metaphors: Re-Examining New Literacies and Black Feminist Thought Through Technologies of Self." *E-Learning and Digital Media* 11 (4): 390–405.

Lewis Ellison, Tisha, and Marva Solomon. 2019. "Counter-Storytelling vs. Deficit Thinking Around African American Children and Families, Digital Literacies, Race, and the Digital Divide." *Research in the Teaching of English* 53 (3): 223–224.

Lykke, Nina. 2010. *Feminist Studies: A Guide to Intersectional Theory, Methodology and Writing*. Routledge.

Maghbouleh, Neda. 2017. *The Limits of Whiteness: Iranian Americans and the Everyday Politics of Race*. 1st ed. Stanford, California: Stanford University Press.

Mann, Larisa Kingston. 2014. "What Can Feminism Learn from New Media?" *Communication and Critical/Cultural Studies* 11 (3): 293–297.

Markham, Annette. 2012. "FABRICATION AS ETHICAL PRACTICE: Qualitative Inquiry in Ambiguous Internet Contexts." *Information, Communication & Society* 15 (3): 334–353.

Marquart, Cody, Zachari Swiecki, Wesley Collier, Brendan Eagan, Roman Woodward, and David Williamson Shaffer. 2019. *RENA: Epistemic Network Analysis* (version 0.2.0.1). https://cran.r-project.org/web/packages/rENA/index.html.

Mercer, Justine. 2007. "The Challenges of Insider Research in Educational Institutions: Wielding a Double-Edged Sword and Resolving Delicate Dilemmas." *Oxford Review of Education* 33 (1): 1–17.

Metcalf, Jacob, and Kate Crawford. 2016. "Where Are Human Subjects in Big Data Research? The Emerging Ethics Divide." *Big Data & Society* 3 (1): 205395171665021.

Morrow, Oona, Roberta Hawkins, and Leslie Kern. 2015. "Feminist Research in Online Spaces." *Gender, Place & Culture* 22 (4): 526–543.

Patterson, Ashley. 2018. "YouTube Generated Video Clips as Qualitative Research Data: One Researcher's Reflections on the Process." *Qualitative Inquiry* 24 (10): 759–767.

Ravn, Signe, Ashley Barnwell, and Barbara Barbosa Neves. 2020. "What Is "Publicly Available Data"? Exploring Blurred Public–Private Boundaries and Ethical Practices Through a Case Study on Instagram." *Journal of Empirical Research on Human Research Ethics* 15 (1–2): 40–45.

Shaffer, David Williamson. 2017. *Quantitative Ethnography*. Madison, WI: Cathcart Press.

Shaffer, David Williamson, and A. R. Ruis. 2017. "Epistemic Network Analysis: A Worked Example of Theory-Based Learning Analytics." *Handbook of Learning Analytics*.

Silge, Julia, and David Robinson. 2016. "Tidytext: Text Mining and Analysis Using Tidy Data Principles in R." *The Journal of Open Source Software* 1 (3): 37.

Tajfel, Henri. 2010. *Social Identity and Intergroup Relations*. Vol. 7. Cambridge University Press.

Thomas, Dexter. 2015. "Why Everyone's Saying 'Black Girls Are Magic.'" Los Angeles Times. September 10, 2015. https://www.latimes.com/nation/nationnow/la-na-nn-everyones-saying-black-girls-are-magic-20150909-htmlstory.html.

Toliver, S. R. 2019. "Breaking Binaries: #BlackGirlMagic and the Black Ratchet Imagination." *Journal of Language and Literacy Education* 15 (1): 26.

Twintproject/Twint. [2017] 2021. Python. TWINT Project. https://github.com/twintproject/twint.

Zimmer, Michael. 2010. ""But the Data is Already Public": On the Ethics of Research in Facebook." *Ethics and Information Technology* 12 (4): 313–325.