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# EXPERIENTIAL MEDIA AND SOCIAL CHANGE: A QUALITATIVE ANALYSIS OF AUGMENTED REALITY FILTERS ON BLACK LIVES MATTER, CLIMATE CHANGE, AND COVID-19 MOVEMENTS

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**Abstract:** Experiential media (EM) technologies such as augmented reality (AR) allow users to make practical contact with or experience the phenomena virtually. Using the qualitative content analysis technique, this study seeks to understand the role of AR, particularly AR filters, in Black Lives Matter (BLM), Climate Change, and COVID-19 social movements, where all three social movements are inextricably connected and dependent on each other. The pertinent concept across these movements is the emergent norm – a sense of just and unjust – central to these movements (Turner, 1969). Taking such a triadic approach (interconnecting social movements) and using the Experiential Media theoretical framework (Pavlik, 2018), this study seeks to understand what types, themes, and to what extent EM qualities are utilized by AR filters offered on (1) *Instagram* and (2) *Snapchat* platforms pertaining to (1) BLM, (2) Climate Change, and (3) COVID-19 (Vaccination, Social Distancing, and Wear a Mask) social movements. Using an iPhone 12 Pro Max smartphone with Light Detection and Ranging (LiDAR) sensor for a seamless AR experience, a total of 466 AR filters were experienced, and observations were recorded in the form of memos for data analysis. This study establishes and explores the existence of AR filters on social movements and dovetails with the existing literature. The potential outcome could be to understand how something that seems trivial and playful as AR filters can help communicate politically for social change and how EM can transform social movements by creating an immersive virtual sphere for the global and local to come together for social change.

**Keywords:** experiential media, augmented reality, AR filters, social change, social movements

## Introduction

Experiential media (EM) are communication platforms or technical interfaces such as augmented reality (AR), virtual reality (VR), and 360° video that enables users to make practical contact or experience phenomena virtually. Using the qualitative content analysis technique, this study seeks to understand the role of AR, particularly AR filters in Black Lives Matter (BLM), Climate Change, and COVID-19 social movements. AR filters are computer-generated effects that augment real-world images. The popular uses of AR filters include enhancing self-portrait or selfie photographs with

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cosmetic and stylized effects that can alter the user's appearance, creation of caricatures or animal transformations.

With the onset of the COVID-19 pandemic, numerous media reports highlight how people are increasingly taking part in online and offline socio-political movements – where mass discussion on various topics, including inequality, systemic racism, and climate change, are brought back along with issues of global health crisis and a historic economic downturn which is fueled by the pandemic. For instance, reports from The New York Times and AXIOS highlight how the BLM, Climate Change, and COVID-19 social movements witnessed an increase in people participation since the onset of the pandemic (NYT, 2020; Harder, 2019). Considering such developments reported in the media and the fact that there is limited scholarly work – particularly research involving qualitative content analysis to explore the types and experiential media qualities of AR filters offered on popular social media platforms pertaining to social change, which is critical to understanding roles and affordances of AR in social change, this research seeks to explore such phenomena.

**Background on the popularity of AR filters**

AR has become a popular term in recent years, as most smartphone models in the market are now capable of showing real and virtual environments on the screen in real-time, thereby providing a truly interactive experience. Social Media giants like Meta, including Facebook and Instagram, and Snapchat, are already seen incorporating AR on their platforms to provide an immersive storytelling experience for their users. Further, organizations like Ikea, Google, etc., are already seen tapping AR filters full potential and capabilities (Jackowski, 2019). For example, Ikea, as a retailer, is using AR to allow its customers to preview through smartphones how some furniture would look in their living space before making a purchase decision. Ikea's app enables customers to view around 2,000 products in AR to help users make an informed choice (Joseph, 2017). Similarly, Google, through its Chrome web browser, allows users to search for AR content online and place AR objects (including NASA's curiosity rover; human anatomy; animals like penguins, sharks, and hedgehogs) in their living space for an immersive learning experience. Google also allows its users to explore a new city or place in AR through its Google Maps. Now, users can navigate and explore a new area with AR overlayed content/information onto the physical world, showing precise direction and infographics – as if they're actually there in the real world (Google, 2020). Other brands such as Ray-Ban, Rolex, and Dulux Visualizer, also allow users to try their products virtually before making a purchase (Marr, 2018). According to the April 2019 earnings report by Meta, an estimated one billion people are using Facebook's AR experiences, including AR filters, while Instagram has 500 million and Snapchat has 190 million daily active users utilizing AR experiences (Facebook, 2019). In Q1 2019, Snapchat reported that a large majority of users on its platform (about 90 percent) are under the age of 35 years and that AR filters were viewed 35 billion times (Grove Jones, 2020).

Further, users can also utilize the readily available AR filters on these platforms or create a new filter, working with Lens Studio for Snapchat or Spark AR studio application for Facebook or Instagram. The use of AR filters can be as simple as placing a country flag or a sports team logo virtually on a user's cheek while taking a selfie to express one's nationality or support for a sports team. Illustrating the popularity of such filters, an AR filter/lens titled 'Flying Face' developed by an Instagram user on Facebook Spark AR studio application in 2019 was viewed one billion times by Instagram users.

Dvoshansky, who created the AR filter, was seen quoting, "I really loved this way of self-expression. It allows giving a part of me to other people through using the whole new type of content" (Wow Filters, 2019). Another example is an AR filter created by an Instagram user, Arno Partissimo, who created the AR filter, "What Disney Character Are You?" which was viewed by millions and shared on other platforms. The AR filter was used by celebrities such as actor Zelda Williams, who added a filter of Genie from the movie Aladdin on her selfie on Instagram and shared on other platforms such as Twitter etc., to represent their favorite Disney character. These examples clearly show the tremendous reach of social media content that is enhanced with AR filters and also developed by users (Lurie, 2020). Meanwhile, a study taken up by JWT Intelligence in partnership with Snap Inc. showed that around 40 percent of Gen Z on the Snapchat platform said they used an AR filter to enhance their selfie photo and video to share with their friends, while another 43 percent enhanced with emojis, and 44% with a color filter to enhance their selfie photos and video (J Walter Thompson Intelligence, 2019). However, the popularity of AR filters is not just limited to commercial or entertainment purposes but is also seen utilized in innovative ways to bring attention to various social issues and people's participation and support for national and international movements pertaining to various political topics.

**Review of Literature**

A growing body of research indicates that EM technologies such as AR are diffusing widely around the world, thereby transforming both media practices and content and the user experience. The earliest forms of AR can be traced back to 1968 when the first AR technology was developed at Harvard. These early AR systems superimposed virtual information on the physical environment, such as overlaying a terrain with geolocation information (Javornik, 2016). With further technological developments, a variation of the virtual environment to supplement reality rather than completely replace the same was developed (Azuma, 1997). Such variations of virtual environment known as AR technology were adopted in six classes of applications, namely: medical visualization; maintenance and repair; annotation; robot path planning; entertainment; and military aircraft navigation and targeting (Azuma, 1997). Today, with further advancements in AR technology, the uses and applications of AR are far beyond what one could have imagined years ago. As Peddie (2017) highlights, AR does more than give directions and visualizations of products and contends that in the near future, AR technology will also integrate body sensors or wearable technologies to monitor our temperature and oxygen level.

While the above examples highlight scientific uses, AR has also been shaping the field of journalism and communication. In the book Journalism in the Age of Virtual Reality, Pavlik (2019) contends that the newer and more immersive media technologies such as AR have led to the emergence of a new form of mediated communication, which he calls, experiential media, where such technology is changing the way stories are told or created. In such immersive environments, the audience's experience is changing due to the multisensory, interactive, and immersive nature – including AR eyewear that emerged in 2018. Such EM forms can also engage users in empathetic narratives that help them understand the truth in complex stories. Furthermore, such EM technologies have also made its way to the social media landscape, where popular social media platforms such as Snapchat and Instagram provide AR experiences and an opportunity to create and share AR filters with other users on such platforms. Such integration of EM technologies in social media highlights

how platforms such as Snapchat or Instagram are the key factor in AR's widespread adoption. At Meta's (formerly Facebook) annual conference in 2017, founder CEO Mark Zuckerberg said, "We are going to make the camera the first augmented reality platform" (Roettger, 2017).

Rios et al. (2018), in a study exploring the uses of AR face lenses on Snapchat, found that users chose face lenses based on goals, personality, and a scroll-first mindset. Rios et al. found that the participants had a goal before entering the mobile application. One of the study participants was quoted saying, "I was doing a sweaty gym selfie, and I wanted to look nicer and prettier than what I look like in real life, so I used a heart filter that lightens my face, brightens my teeth, and it makes me look nicer and thinner like it gives a higher definition of cheekbones," (Rios et al., 2018). In another similar study, Eshiet (2020) found that the participants used AR filters on Snapchat and Instagram, which allowed the users to enhance their lips and expressed getting their lips cosmetically enhanced to look similar to their AR-filtered photos. Eshiet concludes that AR filters and beauty images potentially affect young women's self-esteem and their perceptions of their own body image (Eshiet, 2020). Further, in a study titled, 'Making-up on mobile: The pretty filters and ugly implications of Snapchat' (Barker, 2020) highlights how these AR filters frequently spark controversy by slimming the jawlines and noses, enlarging eyes and lips, and smoothing and lightening the complexions of many users, and how the effects of these filters have caused users to consider the power of self-fashioning and question the standard of beauty being presented.

However, AR lenses on social media platforms are not just limited to face filters focusing solely on beauty. The innovative uses of AR filters can also be seen in social change movements and for sharing political expression. Elaborating more on this phenomenon, activist and social entrepreneur Glenn Cantave says in Ted talk, "Augmented Reality is changing activism. In order to address the systemic racism in this country, we decided to install AR monuments of women and people of color throughout New York City." While, historically, monuments are created to commemorate the achievement of the deceased, Glenn, and his team used AR to bend the rules and create a monument of living people to highlight the injustice of systemic racism (Cantave, 2020). Likewise, in a book chapter titled, Augmented Reality Activism, author Mark Skwarek highlights how AR offers activists the ability to make anything anywhere with no cost besides access to a computer and an Internet connection. Skwarek contends that the borders that separate public and private spheres no longer restrict the activist's vision, Skwarek (2018).

Furthermore, a majority of the scholarly work in political communication, such as Bennett & Segerberg (2012); Delli Carpini & Williams (2001); and Henry Jenkins et al. (2016), all highlight that political communication can also take place outside of formal channels of news and politics. Studies have also explored more broadly the increasing role of social media in the context of political mobilization, including the use of online social networks for coordination of mass political rallies (González-Bailón et al., 2011) or how social media have been in the past used to mobilize volunteers to help map natural disasters (Okolloh, 2009). Studies such as Rutherford et al. (2013) have shown how highly connected people with broad geographic social networks are essential to the successful mobilization of society. On the topic of personal motivation that meets collaborative production, Shirky (2008) highlights that collaborative production, which requires people to coordinate with one another to get anything done, is considerably more complex than simply sharing but has a profound impact. Shirky (2008) contends that new tools allow large groups to collaborate by taking advantage

of non-financial motivations and by allowing for wildly differing levels of contribution, p.109. Likewise, in an op-ed published in Forbes, Agarwal (2020) highlights the potential of AR is revolutionizing political campaigning and also offers a list of precautions that need to be taken to prevent the misuse of AR applications for political campaigning, including strict guidelines for displaying data on AR apps; data privacy; and constant content monitoring.

Further, some scholars also emphasize the need to view both digital and physical spaces on equal fronts. In the context of AR for social change, Skwarek (2018) cautions that "AR can never replace the physical presence of people just like it can never replace reality as a whole; it is merely a tool just like the other tools used by activists such as placards, signboards, graffiti, fliers, and blogs," (Skwarek, 2018, p. 8). Likewise, Jurgenson (2012), in an essay, contends that the rise of mobile phones and social media has created a growing atmosphere of dissent, including flash mobs or massive gatherings of digitally connected individuals in physical space. Considering the role of technology in producing such an atmosphere, which is in part effectively linked to on and offline, Jurgenson (2012) argues that the trend to view these as separate spaces, what he calls "digital dualism," is faulty and that there is a need to enmesh both digital and physical realities.

The above review of the literature section offers insights on two important fronts for the current study, namely 1) The technological developments of AR and 2) the role of AR (and social media more broadly) in social change movements. Further, considering the exploding number of protests – a level not seen in the US since the 1960s Civil Rights protests regarding women's rights, civil rights (including BLM), indigenous rights, human rights, and climate change since the last decade – at just the period when AR as an immersive tool is becoming more accessible on smartphone devices and utilized on social media platforms, there is a need to understand from a qualitative standpoint what types, themes, and to what extent EM qualities are utilized by AR filters offered on popular social media platforms. The current study attempts to fill this gap in the literature.

### *Theoretical Foundations*

Pavlik's (2018) experiential media theoretical framework is based on six primary qualities of the digital environment, i.e., 1) interactivity, 2) immersion, 3) multisensory presentation, 4) algorithm and data, 5) first-person perspective, and 6) natural user interface. Interactivity can be defined as the exchange or communication between users and the EM content experience. Immersion is the envelopment either visually, aurally, or via other senses such as haptic. Multisensory presentation is where communication typically takes place in the form of visual and aural presentations. However, with newer EM platforms, haptics or tactile, user engagement is also available as part of the multisensory presentation. Algorithm and data quality is where the data-driven through AI takes the form of advanced algorithms (programmed instructions or coding) and sensors that track user actions such as gestures or eye movement and generate an experience with near-zero latency – where the delay between user action and a response from the system or virtual experience is imperceptible to the user. First-person perspective means the user enters the virtual experience as if present as a participant or virtual witness to events or experiences. Finally, the natural user interface (NUI) is where the user engages the system and interacts using intuitive means of communication, including gesture, voice, gaze, or touch. Such NUI enhances the user's sense of presence within the virtual environment and

enables participation without the need for training, literacy, or other more technical means of interaction and experience navigation.

The EM model further shows how within the development of digital and networked media, the role of the audience is transforming into an active user who experiences stories as a participant rather than an audience member who tend to passively watch, listen or read the narrative from a third-person's perspective – where the user not just experiences the medium, but also to participates or engages in a story or content itself using EM forms such as AR.

Considering the insights from the review of literature section and the importance of AR technology in social change at this moment in history, this study particularly attempts to explore:

RQ1: To what extent do the AR filters on Instagram and Snapchat platforms pertaining to BLM, Climate Change, and COVID-19 (Vaccination, Social Distancing, and Wear A Mask) social movements utilize the six qualities of experiential media?

RQ2: What are the popular themes highlighted by such AR filters on Instagram and Snapchat platforms pertaining to the three social change movements?

RQ3: What are the types of AR filters offered on Instagram and Snapchat platforms pertaining to the three social change movements?

**Methodology**

Using the above framework offered by the experiential media theoretical framework (Pavlik, 2018), this study seeks to understand what types, themes, and to what extent EM qualities are utilized by AR filters offered on (1) Instagram and (2) Snapchat platforms pertaining to (1) BLM, (2) Climate Change, and (3) COVID-19 (Vaccination, Social Distancing, and Wear A Mask) social movements. Similar to a human body, where individual parts or organ depends on each other and can't survive on their own, each of the above three social movements is inextricably connected and dependent on each other, i.e., BLM had environmental justice as part of its policy platform from the start (because in any crisis including health or environmental, it is the poorest and most vulnerable who suffer), and climate change can both facilitate zoonotic spillovers like COVID-19 and influence transmission chains. The pertinent concept across these movements is the emergent norm – a sense of what is just and unjust – that is central to these movements (Turner, 1969). Further, an increasing number of scholars have adopted such a triadic approach (interconnecting social movements) in research pertaining to various fields (Bloom, 2020; Braverman, 2020) and Mishra et al. (2020). Hence all three social movements are considered for this EM investigation.

***Identifying AR filters for the study***

A total of 356 AR filters on Instagram were identified for this study (as illustrated in Table 1), of which the search for the keywords Black Lives Matter and BLM yielded a total of 113 AR filters on Instagram AR filters search for BLM social movement. Of 113 AR Filters, 23 filters were wrongly tagged to BLM and featured unrelated topics, and 13 AR filters were found to be repetitions. Hence, only 77 AR filters were considered for the AR experience/observation for BLM social change on

Instagram. Similarly, for the Climate Change social movement, a total of 134 AR filters were found on Instagram AR filters search for keywords: Climate Change; Climate; Climate Crisis; Climate Effects. Of 134 AR filters, 14 filters were wrongly tagged and featured unrelated topics, and 31 AR filters were repetitions. Hence, only 89 AR filters were considered for AR experience/observation of the Climate Change social movement on Instagram. Further, for the COVID-19 social movement, a total of 224 AR filters were found on Instagram AR filters search for the keywords: COVID-19; COVID; Vaccine; Vaccination; Social Distancing; Face Shield; Wear Mask. Of the 224 AR filters, 23 filters were wrongly tagged and featured unrelated topics, and 11 AR filters were repetitions. Hence, only 190 AR filters were considered for the AR experience/observation of the COVID-19 social movement on Instagram.

For the Snapchat social media platform, a total of 110 AR filters were identified for the study (as illustrated in Table 2). Of which the search for the keywords Black Lives Matter and BLM yielded a total of 40 AR filters on Snapchat AR filters search. Of 40 AR Filters, two filters were wrongly tagged to BLM and featured unrelated topics, and one AR filter was a repetition. Hence, only 37 AR filters were considered for AR experience/observation for BLM social change on Snapchat. Similarly, for the Climate Change social movement, a total of 28 AR filters were found on Snapchat AR filters search for keywords: Climate Change; Climate; Climate Crisis; Climate Effects. Of 28 AR filters, nine filters were wrongly tagged and featured unrelated topics, and one AR filter was a repetition. Hence, only 18 AR filters were considered for the AR experience/observation of the Climate Change social movement on Snapchat. For the COVID-19 social movement, a total of 103 AR filters were found on Snapchat AR filters search for the keywords: COVID-19; COVID; Vaccine; Vaccination; Social Distancing; Face Shield; Wear Mask'. Of the 103 AR filters, 22 were wrongly tagged and featured unrelated topics, and 26 filters were repetitions. A significant number of wrong tags were pertaining to the keyword Face Shield, which mainly yielded AR filters not related to the COVID-19 movement. Hence, only 55 AR filters were considered for AR experience/observation.

Using the iPhone 12 Pro Max smartphone with Light Detection and Ranging (LiDAR) sensors for a near-zero latency AR experience, all the 466 AR filters on Instagram and Snapchat combined pertaining to BLM, Climate Change, and COVID-19 social change movements were experienced, and observations were recorded in the form of memos. The researcher observed and experienced the AR filters in a noise/disturbance-free environment. The two-or-three-dimensional AR face filters were triggered using the front camera of the iPhone 12 Pro Max, where the researcher experienced and recorded observations pertaining to the above three RQs. The three-dimensional non-face AR filters involved using the rear camera and the LiDAR sensor on the iPhone to scan the floor and trigger the AR experience in the researcher's living space, allowing the researcher to walk around the AR experience and record observations pertaining to the above three RQs. The observation and analysis of AR filters were conducted in July and August of 2021.

*Table 1. AR filters on Instagram pertaining to BLM, Climate Change, and COVID-19 social change movements as of August 2021*

| Instagram AR filters | Containing keywords Black Lives Matter and BLM | Containing keywords Climate Change; Climate; Climate Crisis; Climate Effects | Containing keywords COVID-19; COVID; Vaccine; Vaccination; Social Distancing; Face Shield; Wear Mask |
|---|---|---|---|
| Total: 356 | 77 | 89 | 190 |

*Table 2. AR filters on Snapchat pertaining to BLM, Climate Change, and COVID-19 social change movements as of August 2021*

| Snapchat AR filters | Containing keywords Black Lives Matter and BLM | Containing keywords Climate Change; Climate; Climate Crisis; Climate Effects | Containing keywords COVID-19; COVID; Vaccine; Vaccination; Social Distancing; Face Shield; Wear Mask |
|---|---|---|---|
| Total: 110 | 37 | 18 | 55 |

**Findings and Discussion**

The key findings show that both Instagram and Snapchat platforms offered the highest number of COVID-19 social change AR filters on their platform (245), followed by BLM (114) and Climate Change (107) movements. In terms of the RQ1, the key findings show that a majority (84.76%) of AR filters (both platforms combined) utilized limited qualities of EM, i.e., (1) interactivity, (2) immersion, (3) multisensory presentation, (4) algorithm and data, (5) first-person perspective, and (6) natural user interface. The two main qualities observed in all the AR filters were immersion and first-person perspective. In terms of immersion, AR filters offered only visual envelopment and lacked any auditory envelopment. In terms of the first-person perspective, AR filters offered a sense of virtual experience as if present as a participant or virtual witness to events or experiences.

Meanwhile, the observations showed that the majority of AR experiences lacked the qualities of interaction, multisensory presentation, and algorithm and data as the AR filters offered no exchange between the user and the AR experience – including the lack of embedded content to navigate layered elements of a story; lack of use of data-driven features; or any engagement with AR filters other than triggering the AR experience. In terms of the interaction, the findings showed that there were no forms of exchange or communication dialog between users and the content experience in the majority of AR filter content experiences. The majority of AR filters lacked interaction with the filters via senses such as haptics. In terms of the algorithm and data quality, some AR filter experiences involved tracking user actions features (e.g., gestures, head, and eye movement) and featured a near-zero latency. However, a large majority of the AR filters utilized limited qualities of interaction and algorithm and data, particularly tracking user actions, including gestures and head and eye movement in the actual AR experience other than the triggering of AR filters. Finally, a majority of AR filters also lacked the natural user interface (NUI) quality of EM, where the observation showed that the AR filters offered limited interaction using intuitive means of communication such as voice, gesture, touch, or gaze. It should be noted that NUI is a key EM quality that allows the user to access the virtual environment without the need for training, literacy, or other more technical means of interaction and experience for navigation. Overall, the limited qualities of EM offered by AR filters

can potentially limit the user's sense of presence within the virtual environment and limit user participation and engagement with AR content experience.

In terms of the RQ2 pertaining to the dominant themes, AR filters (on both social platforms) related to the BLM movement highlighted themes such as Power to People; I Can't Breathe; BLM Fist Symbol; End Racism; Celebrate Black History Month; Say Their Names; BLM Mask & Tattoo; Women Support Women; Respect Human; and Go Vote. AR filters pertaining to the Climate Change movement highlighted themes including Climate Change is Real; Fridays for Future; Air, Water, and Plastic Pollution; Endangered Species such as Whales, Pangolins, and Polar Bear; Melting Ice; Mass Extinction; and Oil Spill. For the COVID-19 social movement, themes such as Vaccine Works; Stay Home; Stop Coronavirus; Mask Up & Get Vaccinated; Keep Social Distance; Stay Safe; Save a Life, and Double Mask were highlighted.

Finally, in terms of RQ3, i.e., the types of AR filters featured on both Instagram and Snapchat platforms, a majority of AR filters were 2dimensional AR face filters with limited graphical elements. For instance, a large number of BLM AR filters, including BLM Fist Symbol or BLM Tattoo AR filters, were only static AR filters that allow the user to place the BLM Fist Symbol or BLM Tattoo on the user's cheek or forehead in support of the social change movement. However, the AR filters offer no interaction or 3-dimensional tracking elements per the user's head movement or facial expressions. The findings also showed that the platforms featured limited AR filter types such as quiz, target tracking, or game-based AR filter types which, if offered, could utilize all of the six qualities of EM for a more immersive and experiential AR journey.

**Conclusion and Future Research**

In conclusion, the current study dovetails with the existing literature and points to how something that seems trivial and playful as AR filters can potentially help communicate politically. The study highlights the need for AR filters on Instagram and Snapchat pertaining to BLM, Climate Change, and COVID-19 social change movements to fully utilize the affordances of AR, including all six EM qualities. The findings also highlight the need for AR filters across all three social change movements to feature filters relating to more thematic categories for social awareness. The findings also indicate that the developers of AR filters could offer more AR filter types such as quiz, target tracking, or game-based filters as part of the AR experience for three social change movements. Further, it can be noted that AR as an EM tool can offer immersive and interactive visualization of temporally and psychologically distant scenarios such as sea-level rise as part of the climate change issue (Calil et al., 2021) or visualization of COVID-19 transmission or zoonotic spillover. Such affordances of AR can potentially help overcome the challenges of science communication and inform, educate, and help people create awareness on various social change issues. The study also provides theoretical and applied lessons on how EM transforms social movements by creating an immersive virtual sphere for the global and local to come together. Finally, the study potentially opens a new vista for further research in AR, where considering the evolving nature of the user from the audience to 'prosumers' and 'produsage' where the role of the user in content production and distribution is migrating beyond the traditional industrial paradigm (Bruns, 2008), there is a need to further explore user engagement with AR filters, particularly study to understand the uses of AR filters relating to the BLM, Climate Change, and COVID-19 social change movements, which remain understudied. In this regard, further

examination through participant observations and surveys can help advance our understanding of the role EM plays in digital activism.

**Declaration of Interest Statement**

The authors declare that they have no conflict of interests.

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