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WHAT'S 'UP NEXT'? INVESTIGATING ALGORITHMIC RECOMMENDATIONS ON YOUTUBE ACROSS ISSUES AND OVER TIME

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Introduction

Algorithms play a pivotal role in influencing users' exposure to a range of diverse media content and information sources, which is critical for a media environment supportive of deliberative democracy (Helberger, 2012). Scholars have argued that platforms' focus on maximising 'engagement' can limit user exposure to different points of view (e.g. Pariser, 2011); while others suggest that excessive concern about personalisation limiting users' exposure to diverse content may not be warranted (e.g. Möller et al., 2018). The opacity of algorithms makes it difficult to reconcile these conflicting views. While calls for greater transparency may be justified, the complexities of digital platforms pose unique challenges that complicate the effectiveness of transparency as a tool for generating knowledge about "what is hidden" (Rieder & Hofmann, 2020, p.5). These challenges have motivated a growing body of empirical research interested in studying algorithms *from the outside*.

Observability has been proposed as a path to deal "systematically with the problem of studying complex algorithmic systems" (Rieder & Hofmann, 2020, p.1). Conceptions of *transparency* suggest an algorithm is a mathematical formula that, if revealed for oversight, could improve understanding of platforms' role in media diversity. Contrastingly, as a regulatory tool, *observability* recognises platform algorithms as complex socio-technical systems. Algorithmic

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performance, particularly of those that use deep learning models, is influenced by multiple factors: design choices; built-in randomness; business practices; content creator optimisation tactics; and audience practices. As such, Rieder and Hofmann (2020) advocate for “regulating for observability” (p. 22), stressing the need to observe platform performance over time (p. 24).

Drawing on the idea of platform observability, this paper combines computational and qualitative methods to investigate the types of content YouTube’s ‘up next’ feature amplifies over time, using three search terms associated with sociocultural issues for which concerns have been raised about YouTube’s role: ‘coronavirus’, ‘feminism’ and ‘beauty’. We provide empirical evidence for evaluating the claims made by critics and the counterclaims made by YouTube itself about the function of the platform’s ‘up next’ feature in amplifying problematic, authoritative, or diverse content.

Method

Over six weeks, we collected videos (and their metadata) that were highly ranked in the search results for our three keywords, as well as the top recommendations associated with these videos, repeating the exercise for three steps in the recommendation chain. We then examined patterns in the recommended videos (and channels) for each query and their variation over time. The following research questions informed our analysis: What kind of media does YouTube frequently recommend over time in relation to specific socio-cultural topics? Are there patterns that can help answer longstanding questions about media diversity? Are there patterns that can improve understanding of YouTube’s operationalisation of ‘media authority’?

Our approach provides two main vantage points from which to study algorithmic cultures: as time is crucial to platform observability, we examine recommendations over time, moving away from the “snapshot logic” underlying many studies on algorithmic accountability (Rieder & Hofmann, 2020, p. 7); and because ‘good’ recommendations can only be envisioned and operationalised in relation to specific issue domains, we study recommendations across specific topics (Rieder, 2020, p.334).

Findings

We found significant variation in recommended videos (content diversity) over time and across queries. This finding aligns with the company’s commitment to “diversification” in the ‘up next’ section (Davidson et al., 2010). Yet, we also found YouTube clearly prioritises certain channels (source diversity) over time and across steps, which provided important insights into how YouTube operationalises “authoritativeness” in practice. US channels dominated across queries, down the chains, and over time, highlighting the cultural dominance of the US on YouTube (Rieder et al., 2020). Our data also suggests that YouTube makes decisions to categorise certain topics deemed societally significant and truth-oriented enough for heavy-headed platform intervention (e.g. vaccination, climate change, elections), while others (e.g. gender politics and beauty) are less regulated by YouTube.

While YouTube might be committed to offering video diversity in the ‘up next’ section, we found that the videos most recommended for each of our queries did not feature a breadth of genres, viewpoints, or framings. For ‘beauty’, YouTube’s ‘up next’ section favoured channels uploading highly stereotyped, commercialised and gendered content, and for ‘feminism’ it prioritised channels run by male YouTubers with strong anti-feminist views. These findings indicate that YouTube has not effectively addressed content diversity from a social perspective (failing to attend to factors such as race, gender, nationality, sexuality and ability).

Our findings show a clear correlation between frequently recommended channels and popularity and 'freshness' (YouTube's proxies for 'quality'). However, platform and issue vernaculars (Gibbs et al., 2015) also play a role in influencing what was recommended for each query. Increasingly, content creators understand the importance of 'gaming' social media algorithms to boost visibility (Bishop, 2019), implementing and testing various optimisation tactics—e.g. use of relevant keywords in headlines—to increase their chance of amplification by recommendation systems, which was visible in both the 'feminism' and 'beauty' data.

Finally, we found the algorithms underpinning the 'up next' feature to be, like ranking algorithms, sensitive to newsworthy events and controversies (Rieder et al., 2018, p. 63). This was visible in the 'feminism' data where India-based channels uploading new content to YouTube were recommended at high rates after a gender-based controversy relating to Indian actress Neha Dhupia.

Conclusion

This paper provides the basis for a crucial intervention in the space between technology press speculation and folk theories about algorithms on the one hand, and abstract critical theory on the other. We show how corporate understandings of diversity, quality and authoritativeness, and their operationalisation in practice, can have significant limitations in terms of improving the types of content that are amplified by automated recommendations systems and, potentially, the types of information users are exposed to in relation to issue domains.

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