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### Follow the Algorithm: Assessing Facebook's Group Recommendation Behavior Regarding Conspiracy Theories and Echo Chambers

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## Introduction

Social media has become one of the primary methods for Americans to consume their news. Simultaneously, digital misinformation is widely understood to exacerbate public health crises and remains widespread on the internet. Due to Facebook's repeated scandals regarding their influential role in social and political events, this research seeks to understand how Facebook's group recommendation algorithm (FGRA) may bias towards recommending groups that circulate conspiracy theories to users.

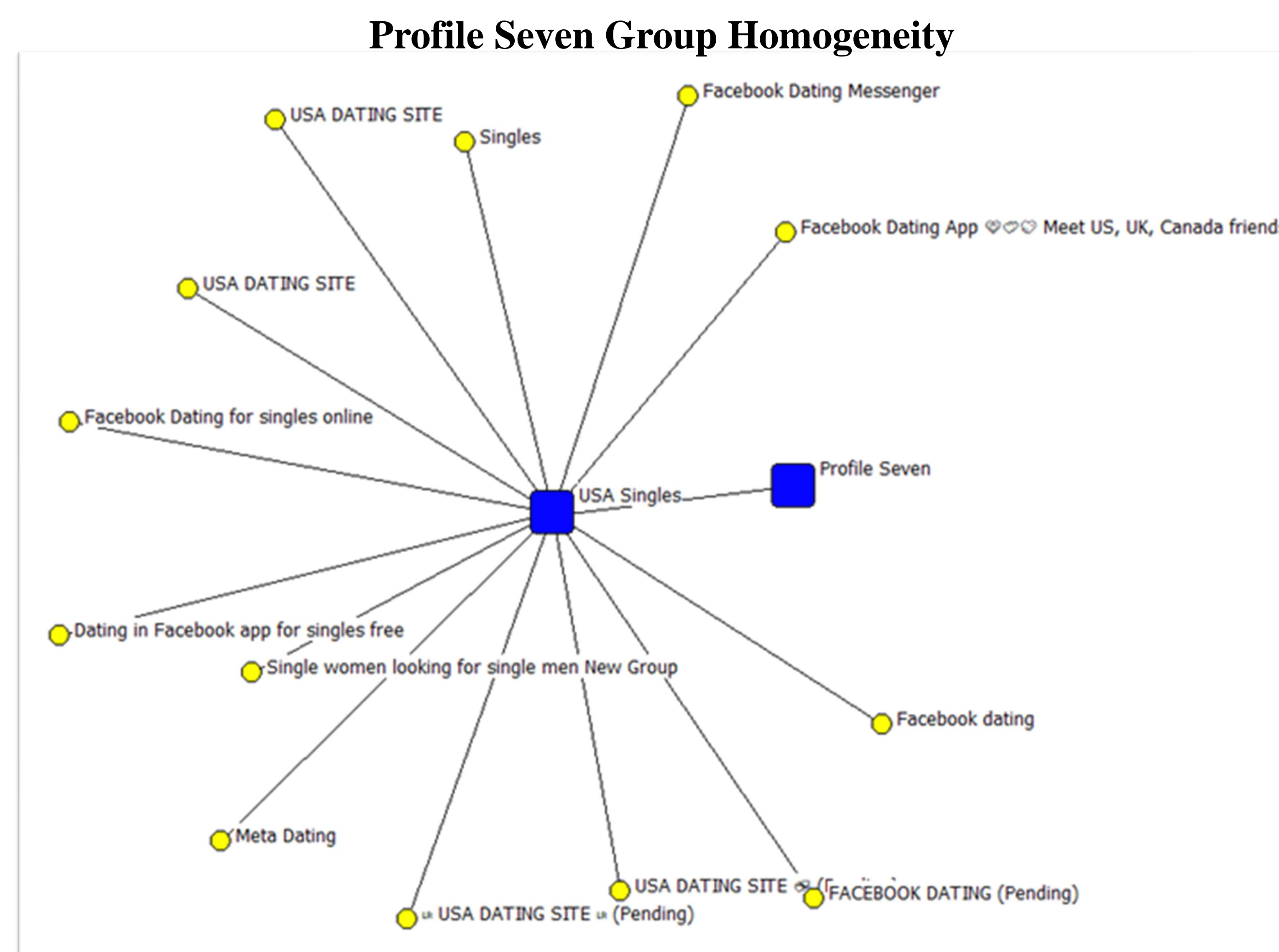
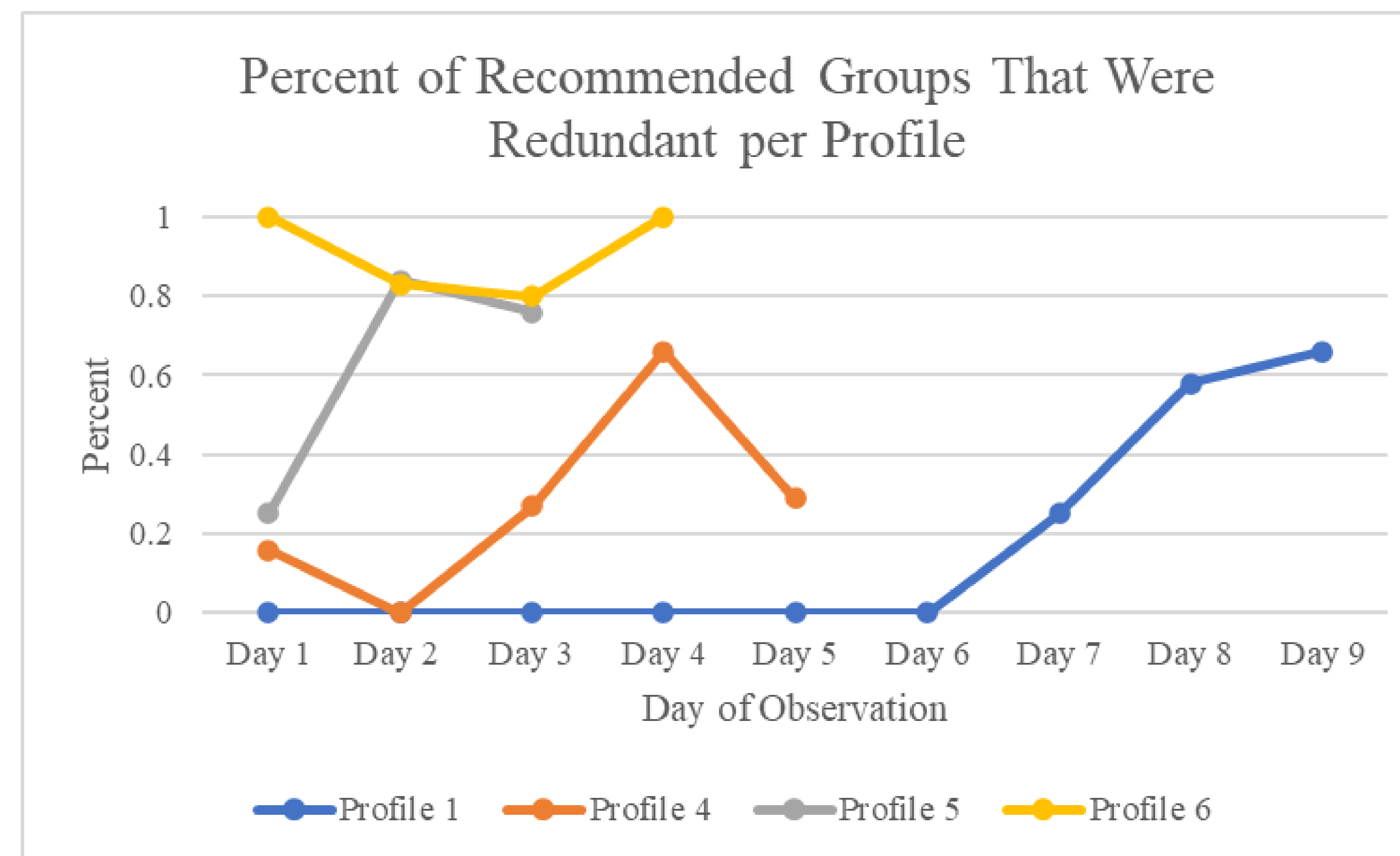
Facebook operates in the attention economy. Consequently, FGRA recommends content it determines to be the most likely to retain users to the platform, however, the Facebook Papers (leaked in 2021) showed that Facebook's algorithms rank agitating content higher than joyous content. These two imperatives have troubling implications for social wellbeing. Unfortunately, Facebook remains opaque regarding its algorithm's computer science. Therefore, this research investigates how the algorithm manifests to an end user.

## Methods

Eight test profiles were observed over three months. Each profile's behavior was greatly restricted to control for the possible influence of user input on what content was recommended to each profile. Profiles 1-3 were identical except for their behavior on the platform. Profiles 4-8 included minute variations in their demographics and behavior to test the algorithms responsiveness to user input.

The number one groups recommended to the profiles (higher rank means greater relevance) were observed and joined every day of the profile's lives, and the topics of the groups were documented. Observation ceased and the profile was retired if it was recommended a group whose topic was that the 2020 presidential election was stolen, or when the profile ceased being recommended novel groups.

Sample Observation Data						
	Profile Number	Gender	Name	Groups Observed	Lifespan (days)	Pages Followed
Protocol 1	Profile 1	Male	Mark Hutchinson	108	11	0
	Profile 2	Male	Mark Hutchinson	36	3	0
	Profile 3	Male	Mark Hutchinson	6	1	0
Protocol 3	Profile 4	Male	Mike Smith	44	5	2
	Profile 5	Female	Olivia Smith	56	3	2
	Profile 6	Female	Olivia Smith	30	4	2
	Profile 7	Male	Mike Smith	13	1	2
	Profile 8	Male	John Deere	32	2	2



## Results

325 groups were observed in total. Of those, 19 groups were recommended solely on geographical location. These groups served as the baseline for each profile. Recommendations became more tailored as observation continued, and eventually reached complete topic homogeneity. At no point was a group recommended to any test profiles whose topic was the conspiracy theory that the 2020 election was stolen.

Profiles with the fewest user inputs had the longest delays to homogeneity, and vice versa. User input, and the input type appeared greatly influential on FGRA, with some behaviors resulting in immediate homogenization, and others being more delayed.

## Discussion

Firstly, this research does not indicate that Facebook's Group Recommendation Algorithm (FGRA) biases towards recommending conspiracy theory groups to users. Secondly, despite concerns that social media platforms, and Facebook specifically, are fueling the virality of digital conspiracy theories (such as Stop the Steal), it appears that user input is the primary driver of what groups and group topics are recommended to users by FGRA.

Rather than being a progenitor, Facebook's role in the spread of digital misinformation is to host conspiracy theory hubs where individual users engage in ideological reaffirmation. This clarifies how the nature of digital misinformation should be investigated, as the over-attribution of causality to social media platforms risks undervaluing that individuals have agency to influence themselves and others, rather than technologies.

Limitations include the opaqueness of Facebook as a platform, as well as the lack of a transdisciplinary conspiracy theory scale or theory. Future research should investigate the role of social media as a means of how individuals can reaffirm each others conspiratorial beliefs without physical contact.

