

Temporal graph analysis of the far-right social network Gab

Naomi Arnold, Ben Steer, Imane Hafnaoui, Hugo Parada, Raul Mondragón, Félix Cuadrado, Richard Clegg



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What is Gab?

“A social network that champions free speech, individual liberty and the free flow of information online.” — gab.ai front page

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What is already known about Gab?

What is Gab? A Bastion of Free Speech or an Alt-Right Echo Chamber?

Savvas Zannettou*, Barry Bradlyn#, Emiliano De Cristofaro†, Haewoon Kwak+, Michael Sirivianos*, Gianluca Stringhini†, Jeremy Blackburn

Aa

High hate speech concentration, popular among alt-right celebs

From “Welcome New Gabbers” to the Pittsburgh Synagogue Shooting: The Evolution of Gab

Reid McIlroy-Young, Ashton Anderson

Evolution of hateful language in post content



Elites and foreign actors among the alt-right: The Gab social media platform

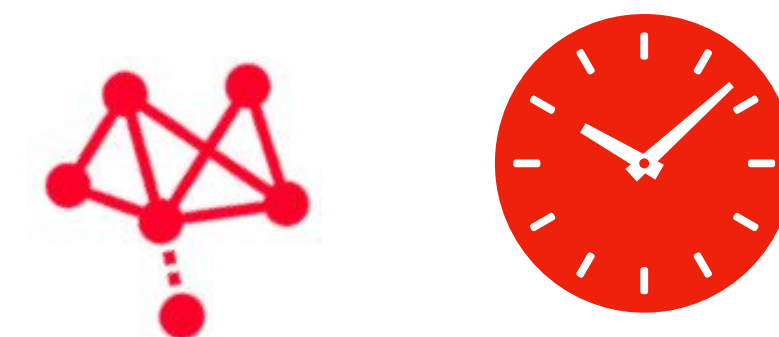
by Yuchen Zhou, Mark Dredze, David A. Broniatowski, and William D. Adler

Hierarchical structure of follower/repost distribution

Aa



Our work: studying Gab interactions over time

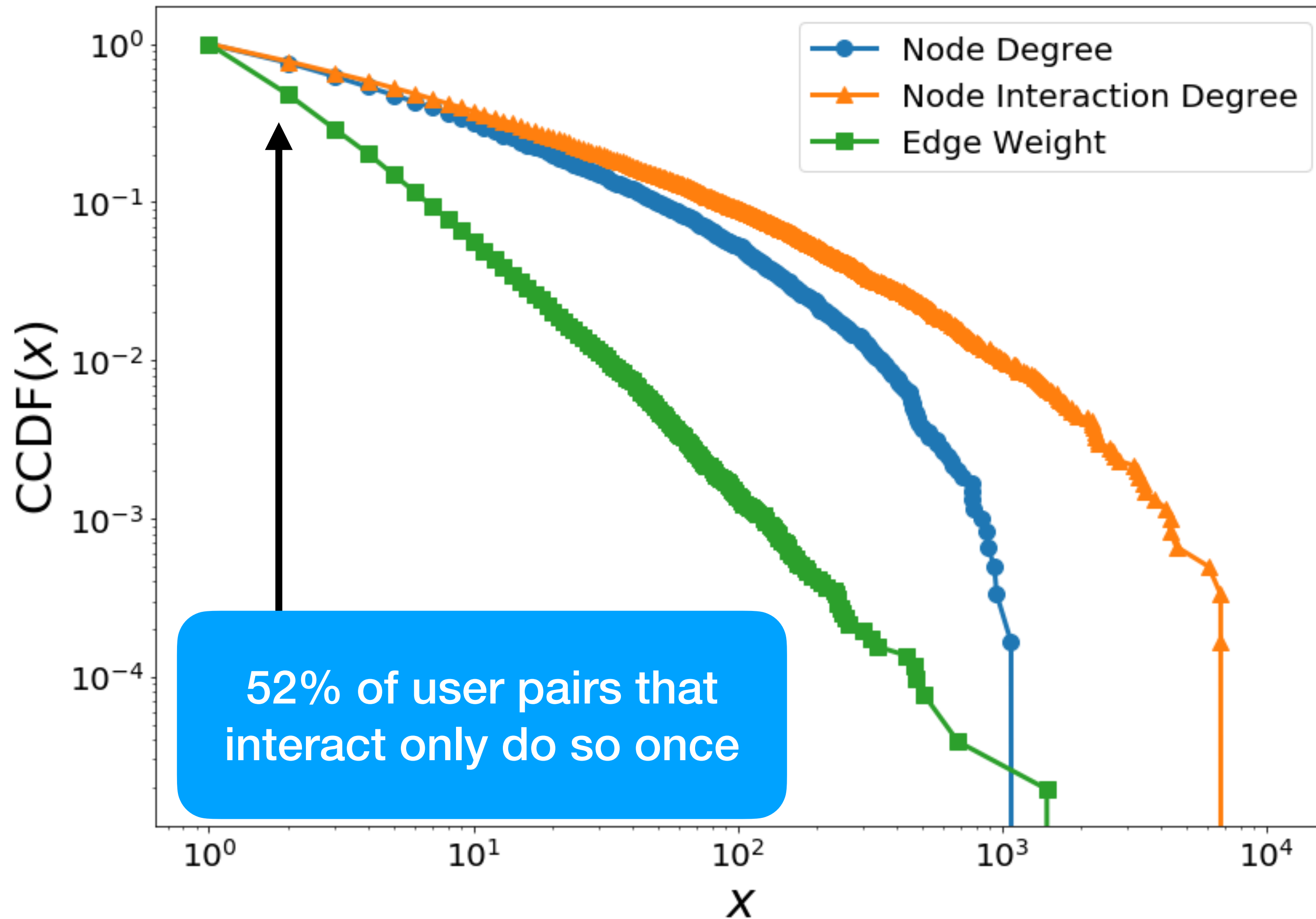


Dataset

- **All posts** between Aug 2016 and May 2018
- “Interactions” = post replies, same level as posts

| Property | Quantity |
|-----------------------------|-----------------|
| Number of users | 169,745 |
| % of users that never reply | 48.5 % |
| Number of posts | 19,091,476 |
| % as original posts | 62.5 % |
| % as replies | 37.5 % |
| % as self-replies | 1.53 % |

Interaction distributions



52% of user pairs that interact only do so once

Interaction degree a different concept to degree

Edge weights are heavy tailed

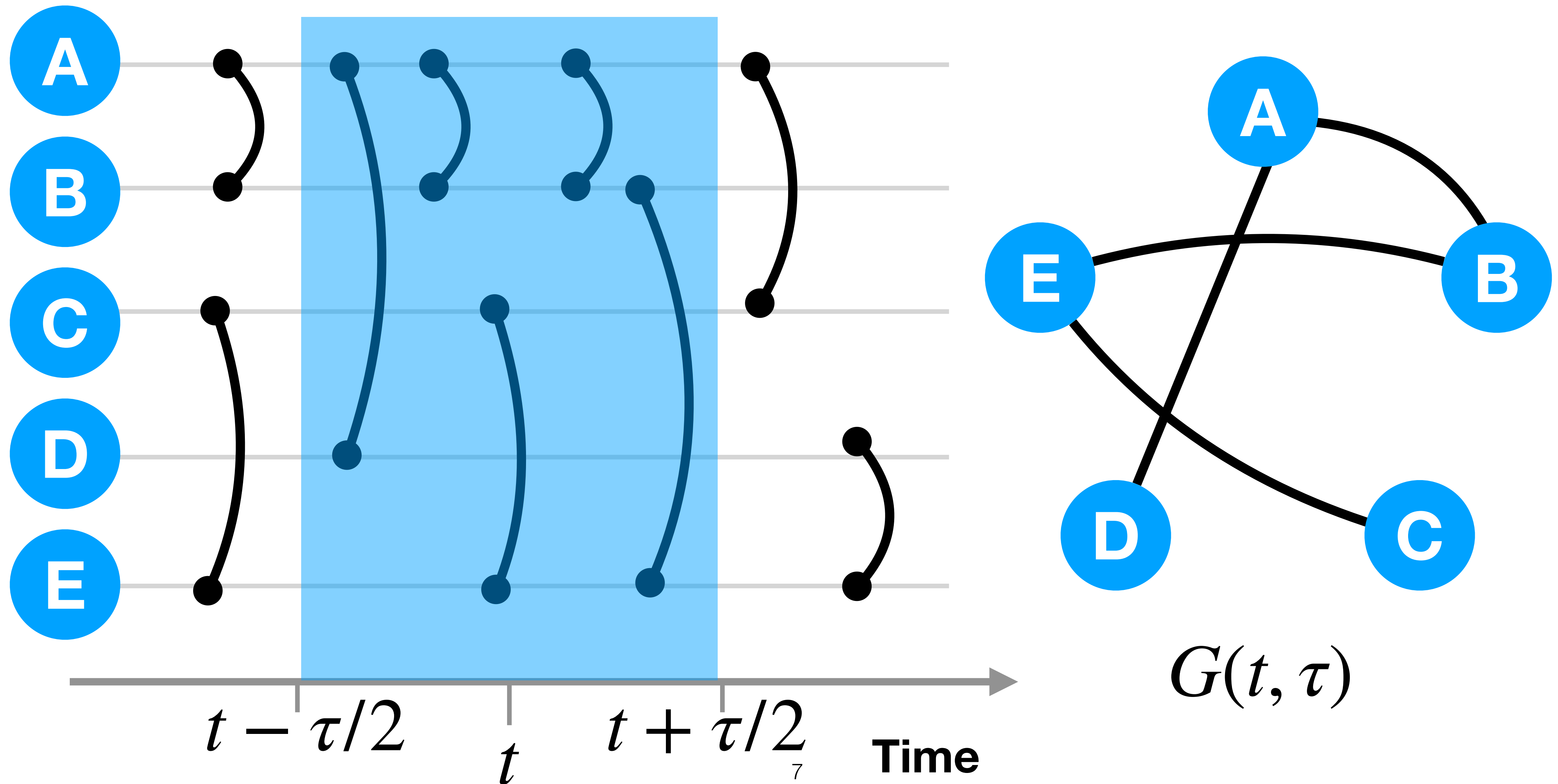
Our research questions

1. **Growth.** To what extent is Gab growing in its userbase and interactions, and what drives growth on the site?
2. **Cohesion.** Can Gab be considered a single community or disparate groups?
3. **Influence.** Is Gab consistently dominated by the same users or do these change over time?

Investigate using temporal interaction graphs



Temporal graph construction



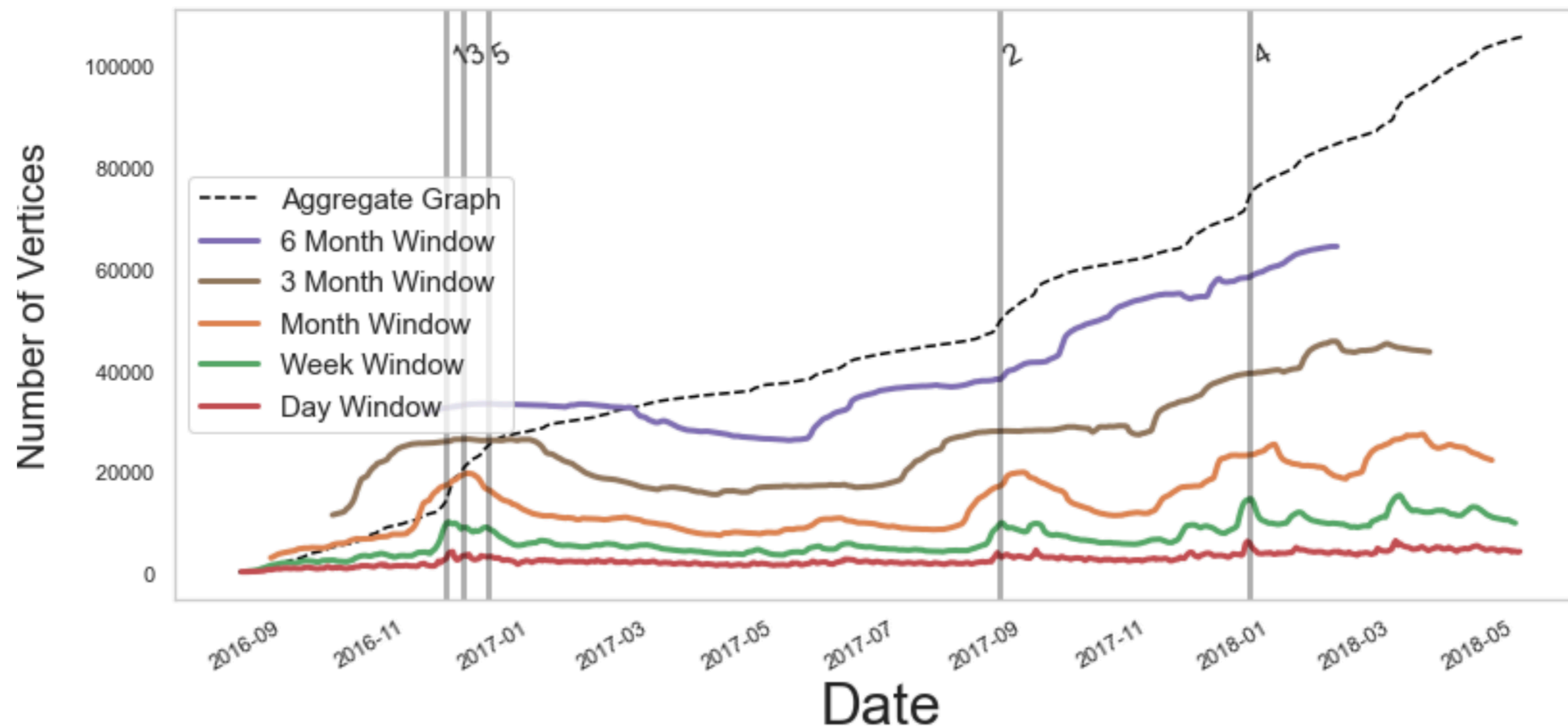
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Number of users

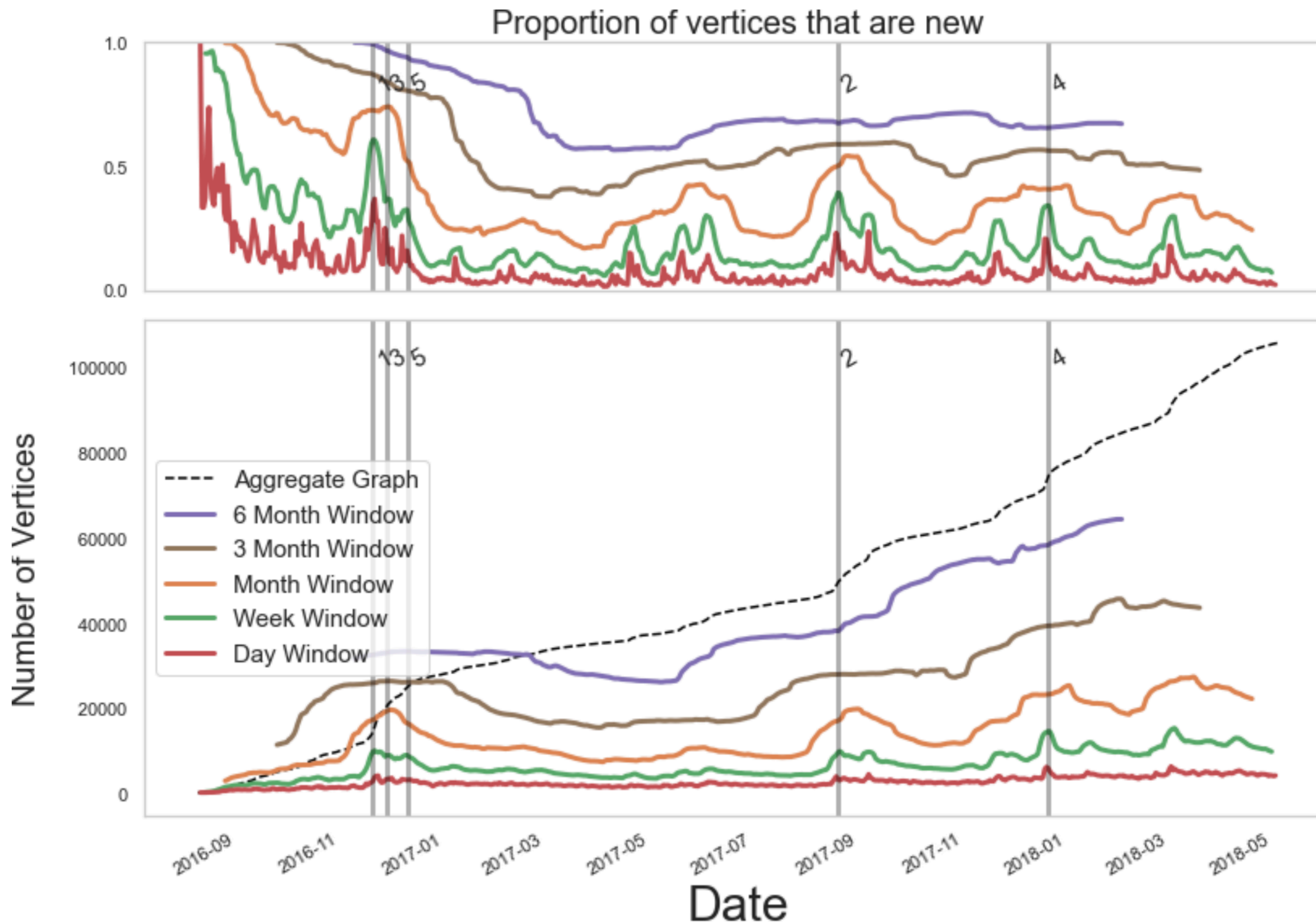
Peak 1, 3, 5: Trump Election
Peak 2: Charlottesville Rally
Peak 4: Twitter deplatforming

19% of monthly users active on any given day (compared to 44% for Twitter)

Some events lead to a sustained increase in number of users



Number of users

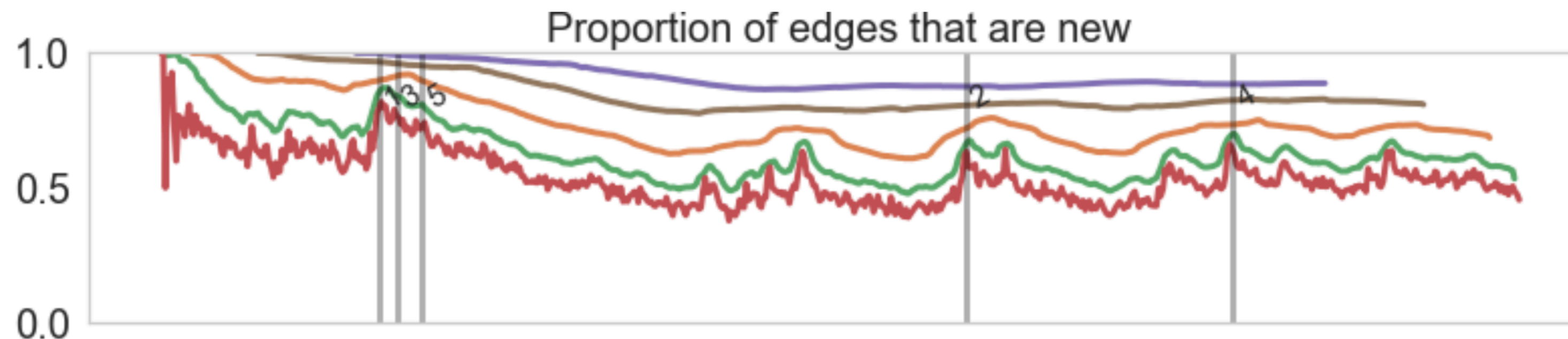


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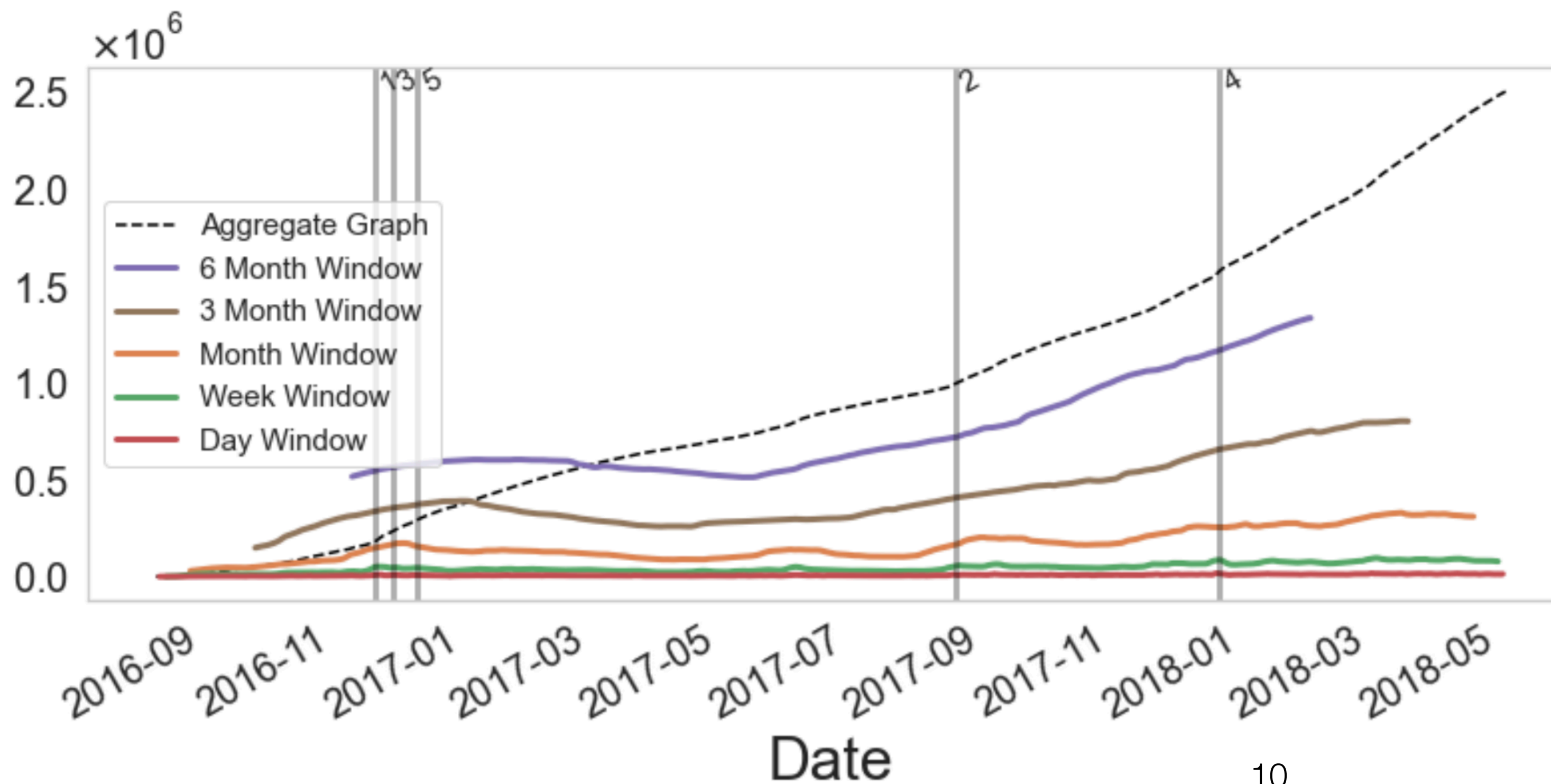
19% of monthly users active on any given day (compared to 44% for Twitter)

Some events lead to a sustained increase in number of users

Number of edges



Peak 1, 3, 5: Trump Election
Peak 2: Charlottesville Rally
Peak 4: Twitter deplatforming

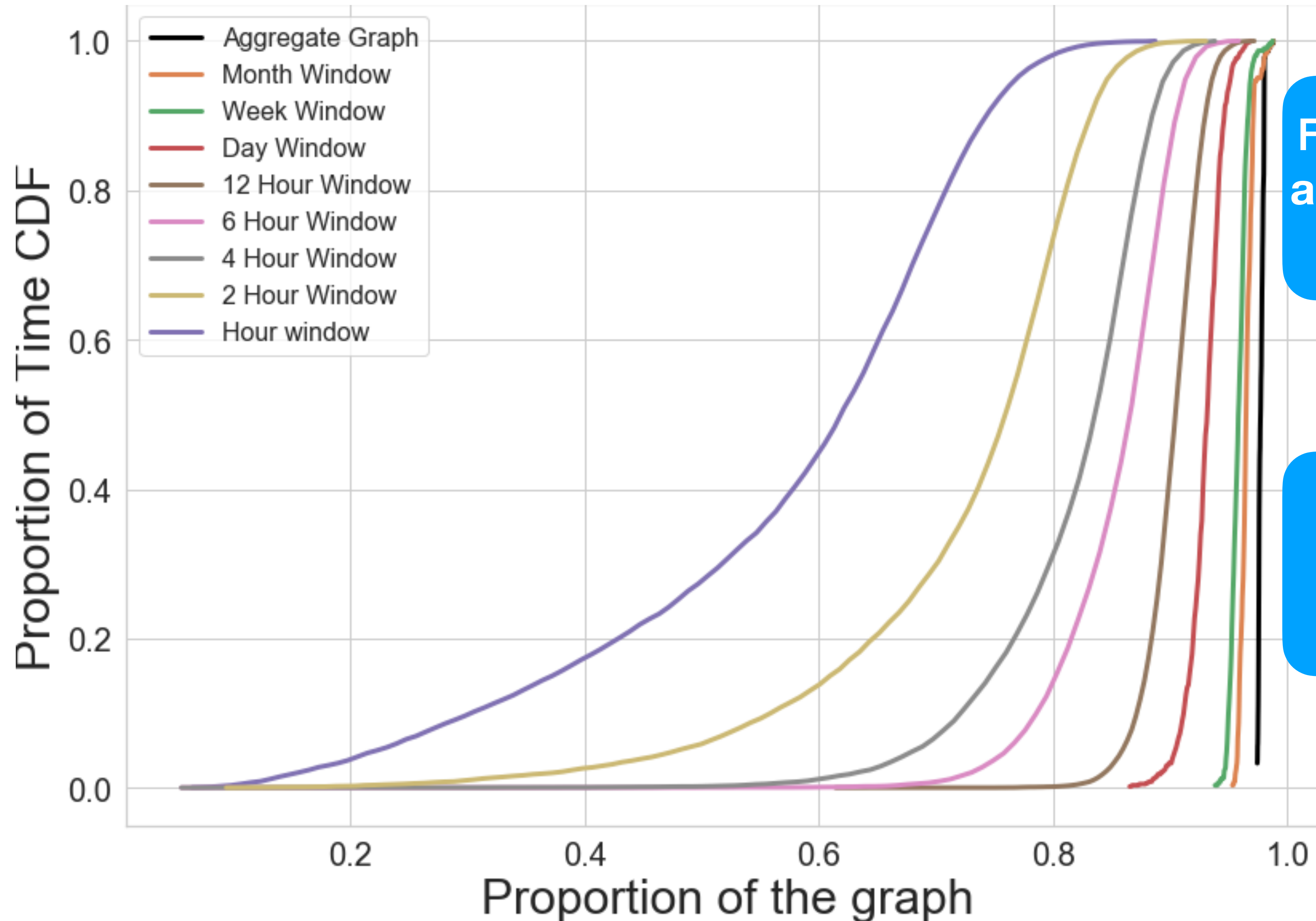


Over half of the edges on all timescales between users who have never previously interacted

Spikes in new edges associated with right-wing events of interest

2. Cohesion. Can Gab be considered a single community or disparate groups?

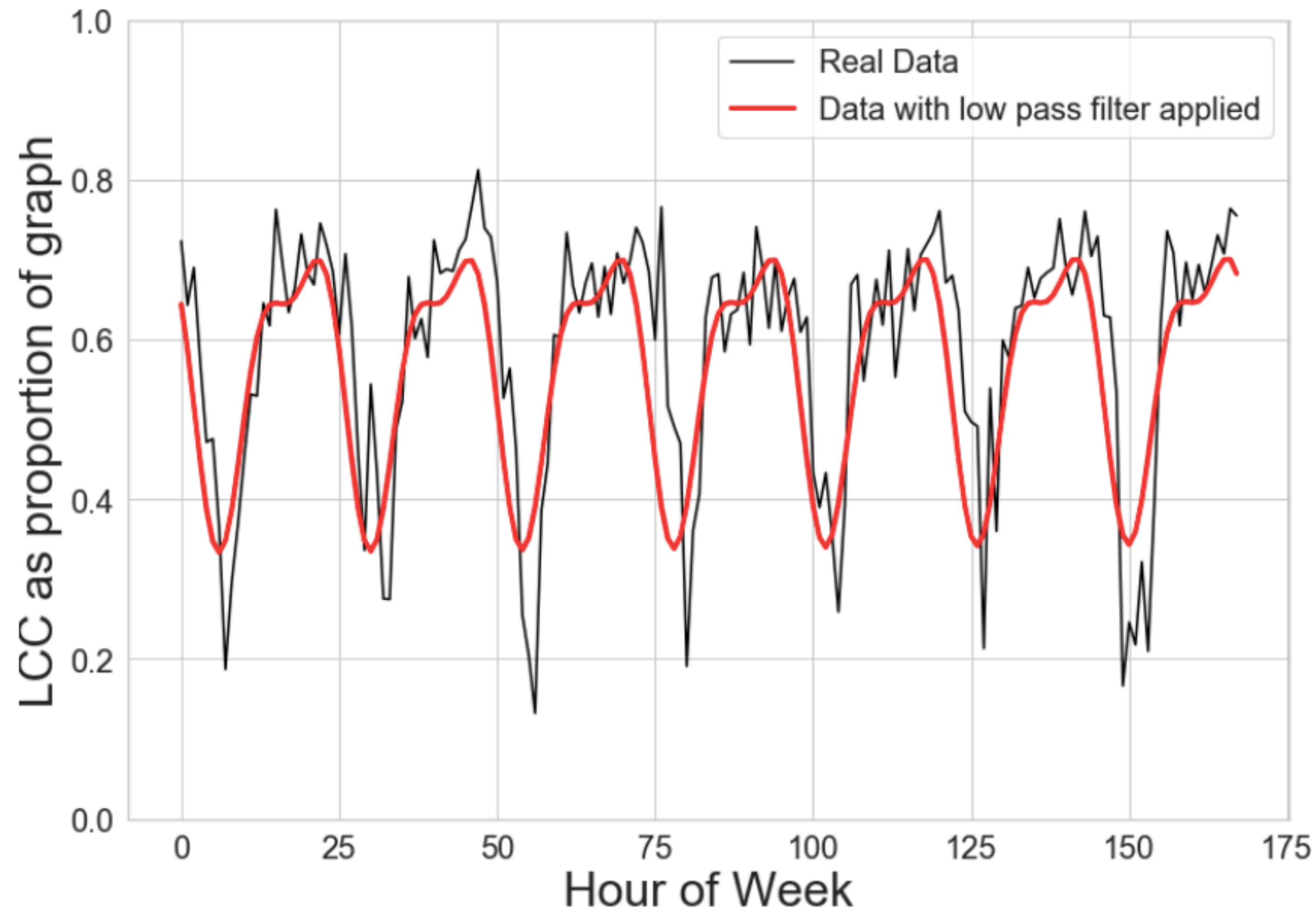
Relative size of largest connected component



For windows over a day size, there is always a giant component (LCC over 90% of the graph)

For hour-sized window, much more variation

Hourly behaviour of the LCC

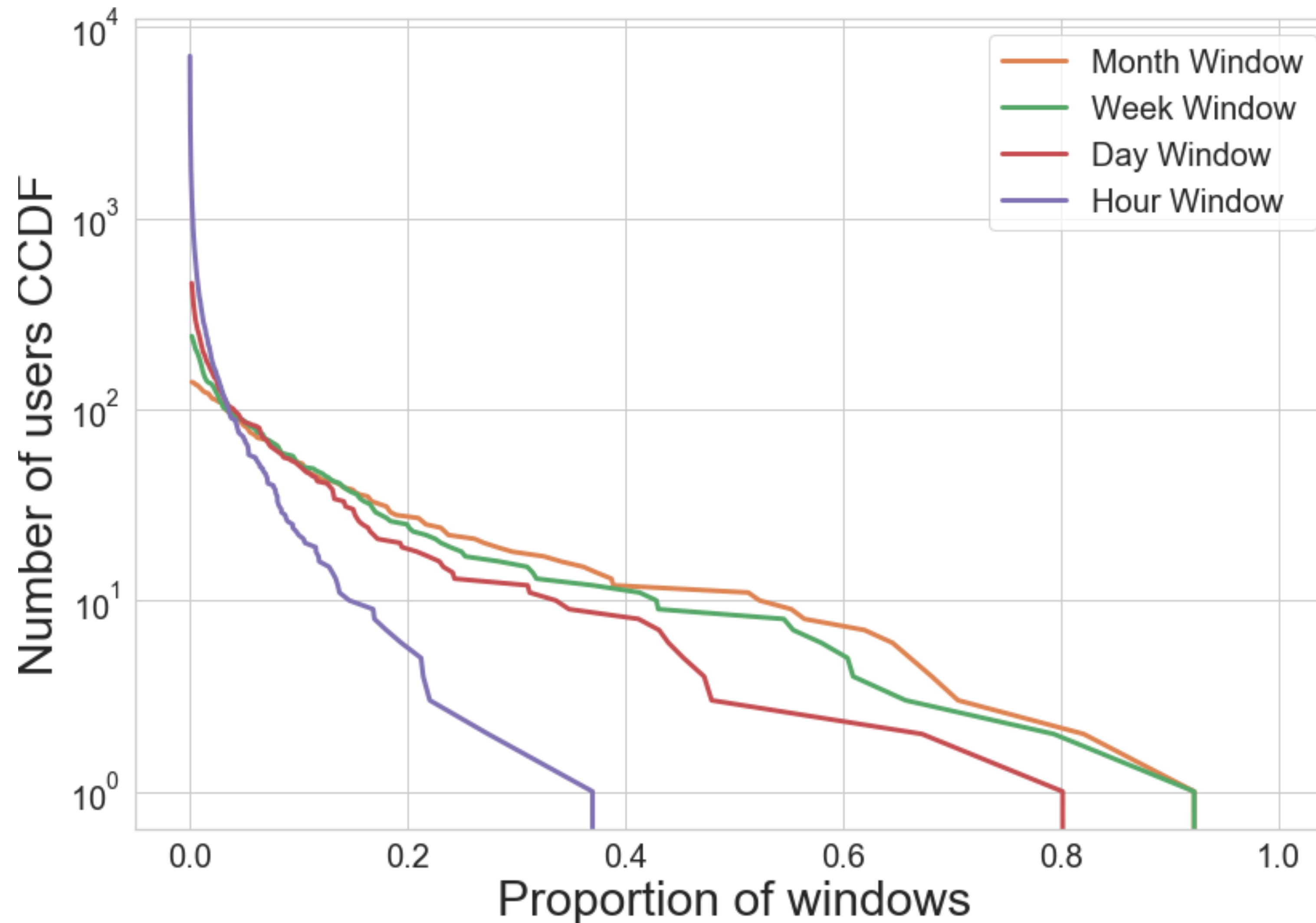


Forming and shattering of the largest component not before observed in online social networks

Two peaks with around 6hr gap, corresponding with EU and US userbase

3. Influence. Is Gab consistently dominated by the same users or do these change over time?

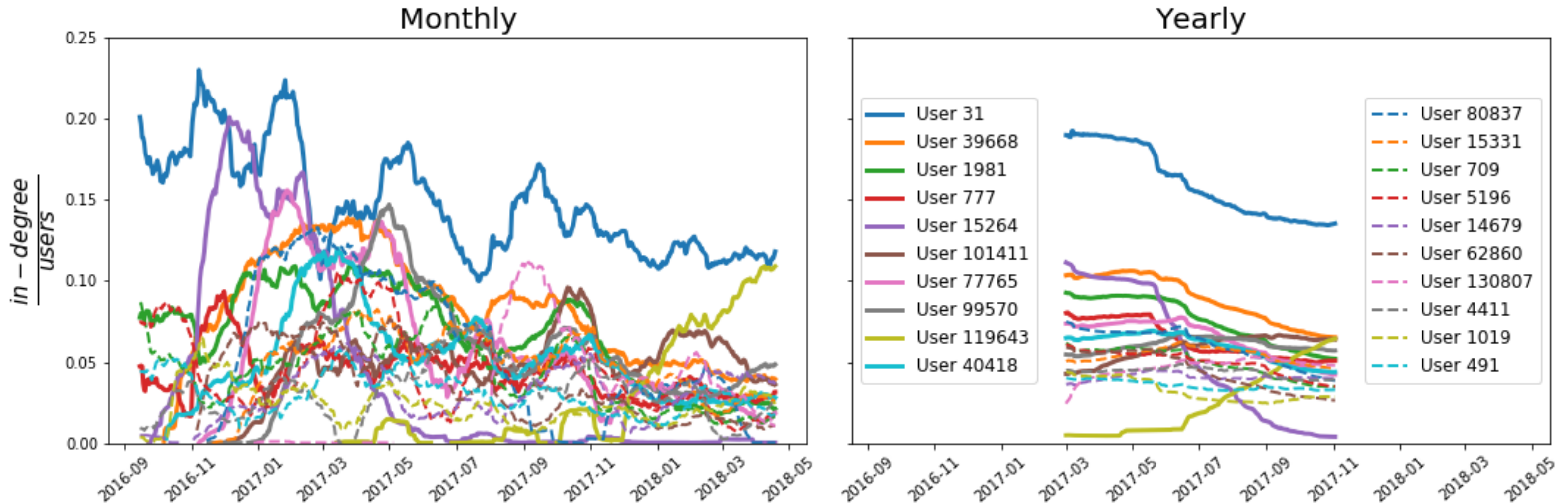
How long do users spend in the top ranks?



Ranking is by in-degree in terms of interactions with distinct users

Most users who enter the top 20 do so very fleetingly (800 who enter the daily top 20 once and never again)

Trajectories of all time top 20 users



Some users hold huge share of attention on Gab (> 20% of users)

More stable trend across year windows with users rarely overtaking each other

Takeaways

- Gab active userbase is **event-driven**, with some events leading to sustained rises.
- Characterised by **interaction between strangers** rather than **maintaining of friendships**
- **Small core** of users who are dominant a large proportion of the time, with much **larger pool of users** who gain influence fleetingly.
- All insights obtained by studying the graph at **different timescales**

Thanks for listening! What are your questions?

Moving with the Times: Investigating the Alt-Right Network Gab with Temporal Interaction Graphs

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Raul J. Mondragón,¹ Felix Cuadrado² and Richard G. Clegg¹**

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Raphorty

temporal graph analytics

CSCW Paper

[https://dl.acm.org/doi/abs/
10.1145/3479591](https://dl.acm.org/doi/abs/10.1145/3479591)

Link to Raphorty:

[https://
raphorty.readthedocs.io/en/
master/](https://raphorty.readthedocs.io/en/master/)