

# Toxicity in online political deliberation

The case of YouTube during the 2020 US presidential election

*Gabriela Juncosa, Taha Yasseri, Júlia Kóltai, and Gerardo Iñiguez*

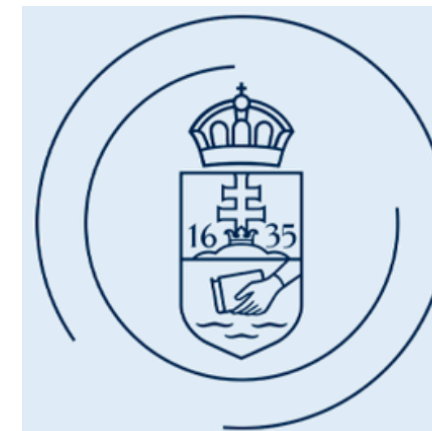
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Network and  
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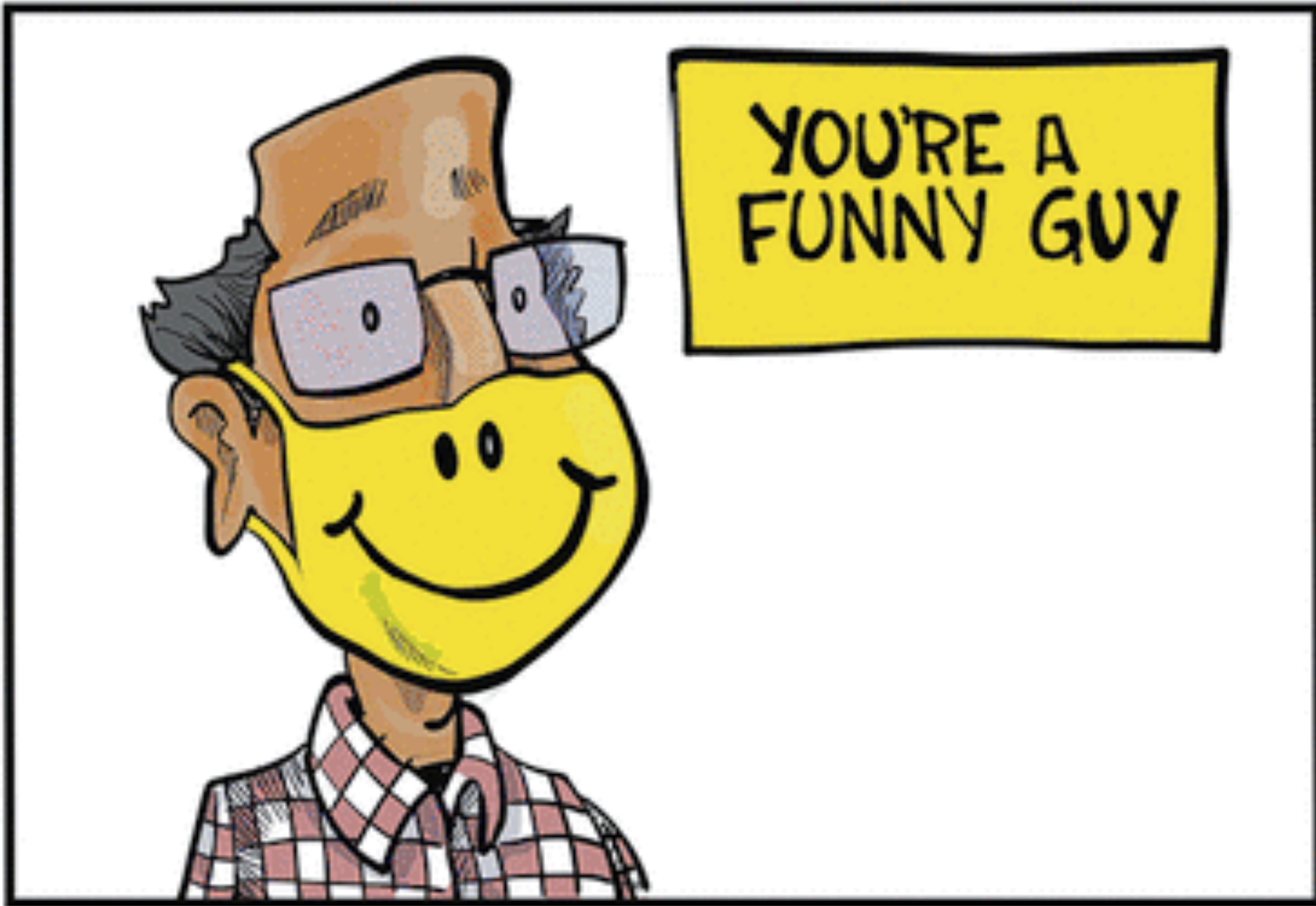
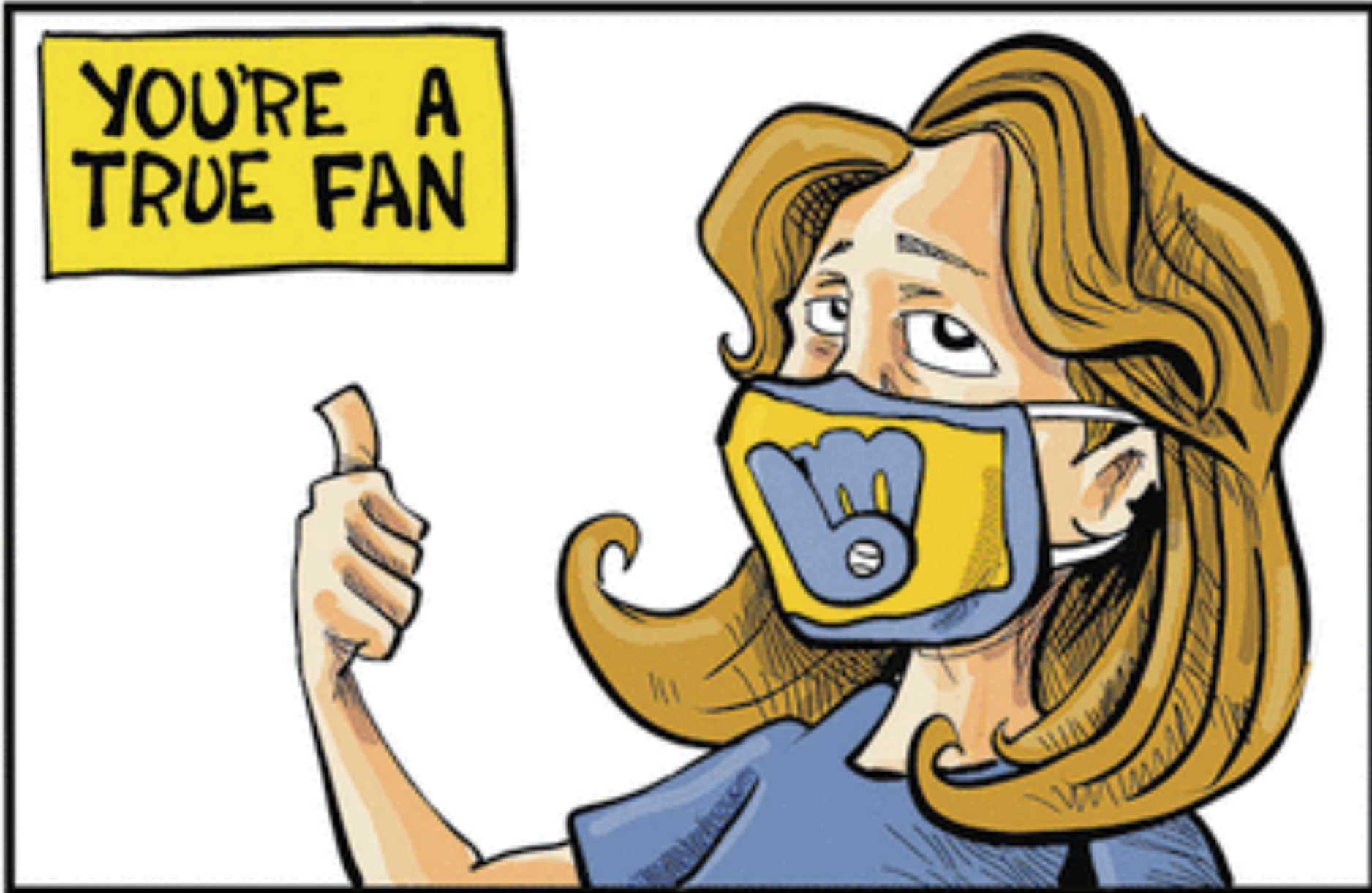
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UNIVERSITY



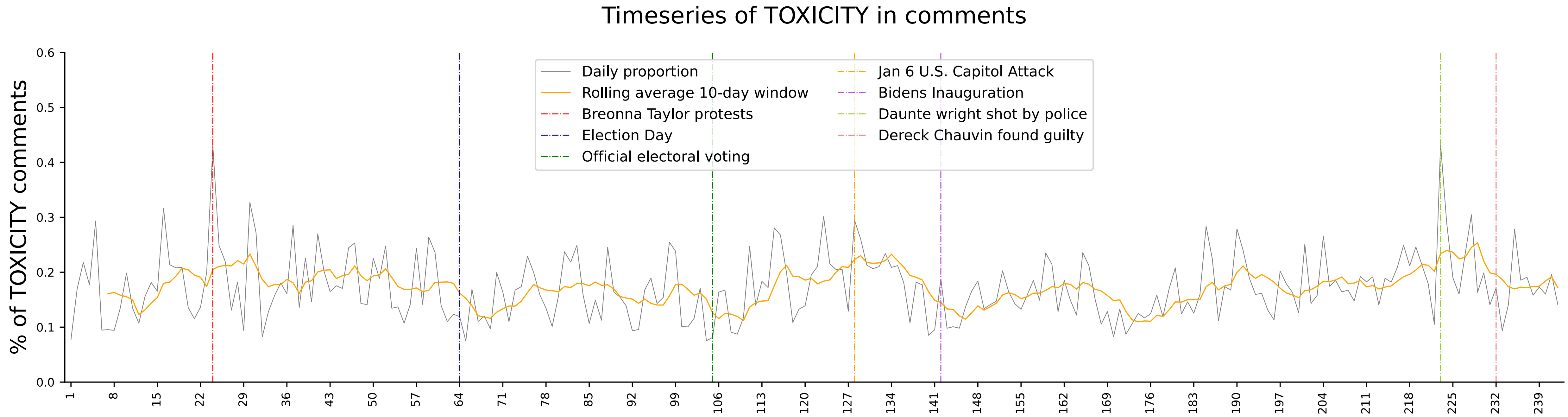
# WHAT YOUR FACE MASK SAYS ABOUT YOU





**When talking about politics online and the conversation becomes hostile, do users choose silence?**

# Prevalence of Antisocial Behaviour



**When talking about **politics online** and the conversation becomes hostile, do users choose silence?**

**Event: U.S. 2020 presidential elections**

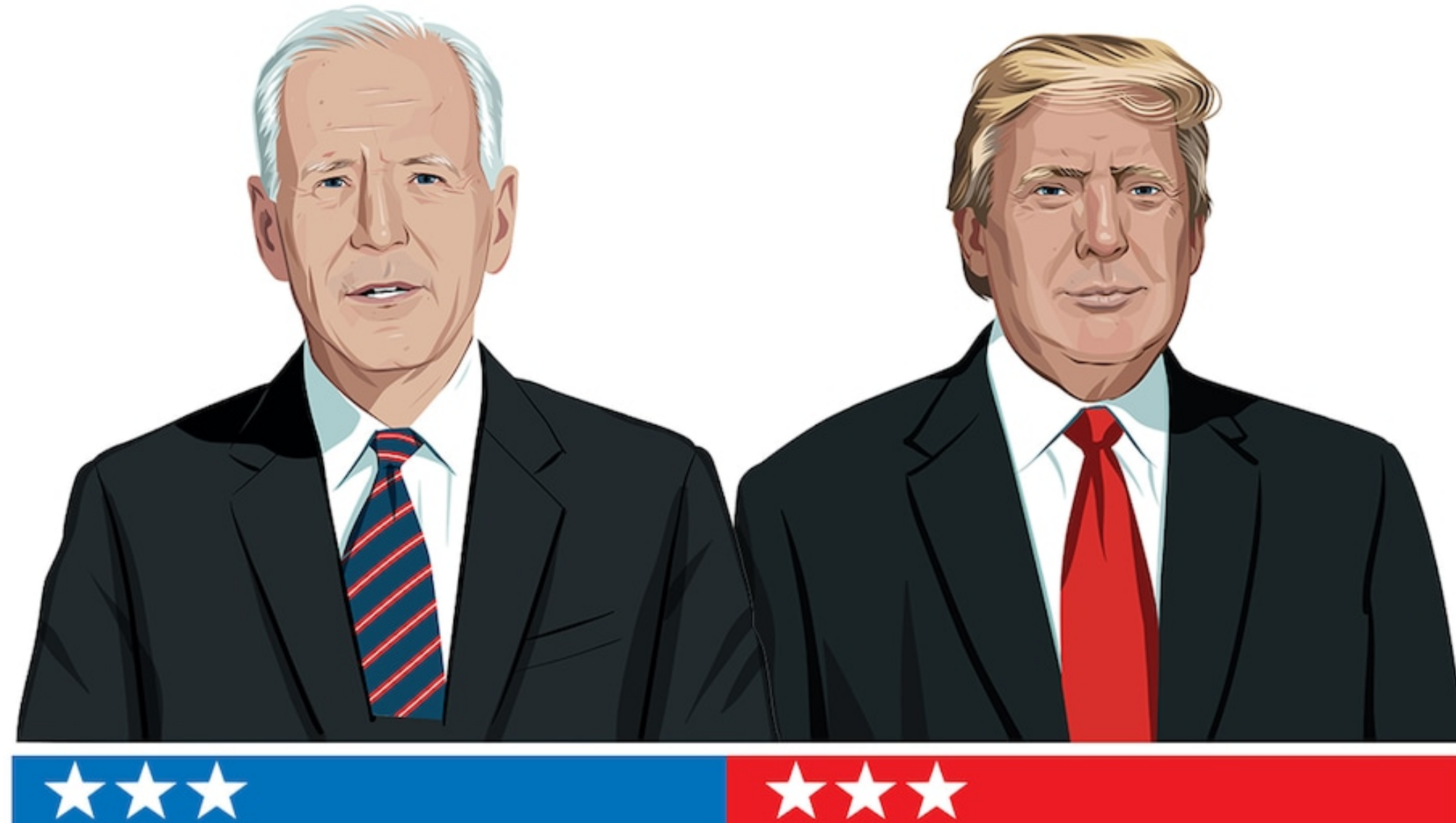
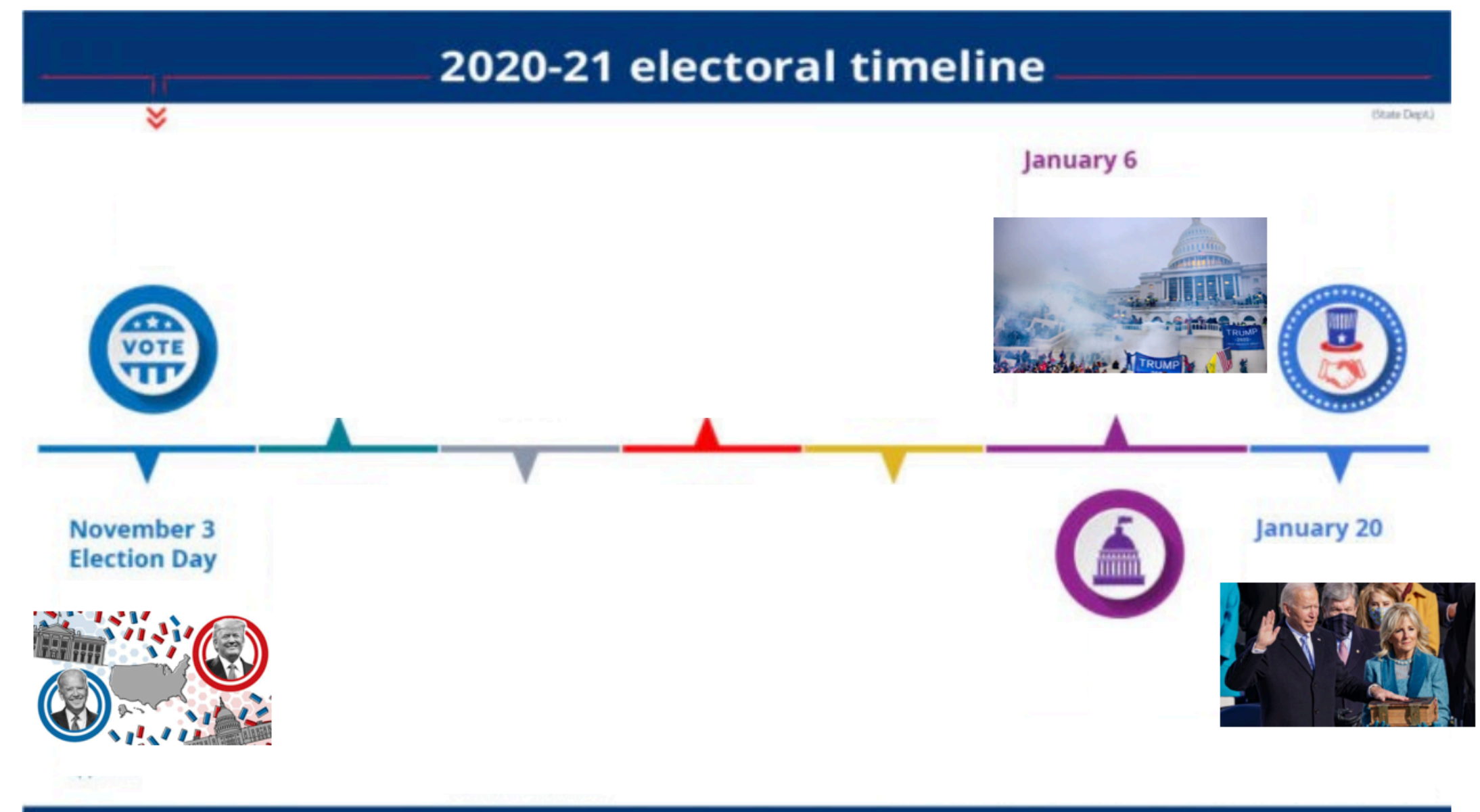


Illustration by Ben Kirchner for The Washington Post

**Period: Sept 2020 - April 2021**



Source: National Archives



**Event: U.S. 2020 presidential elections**

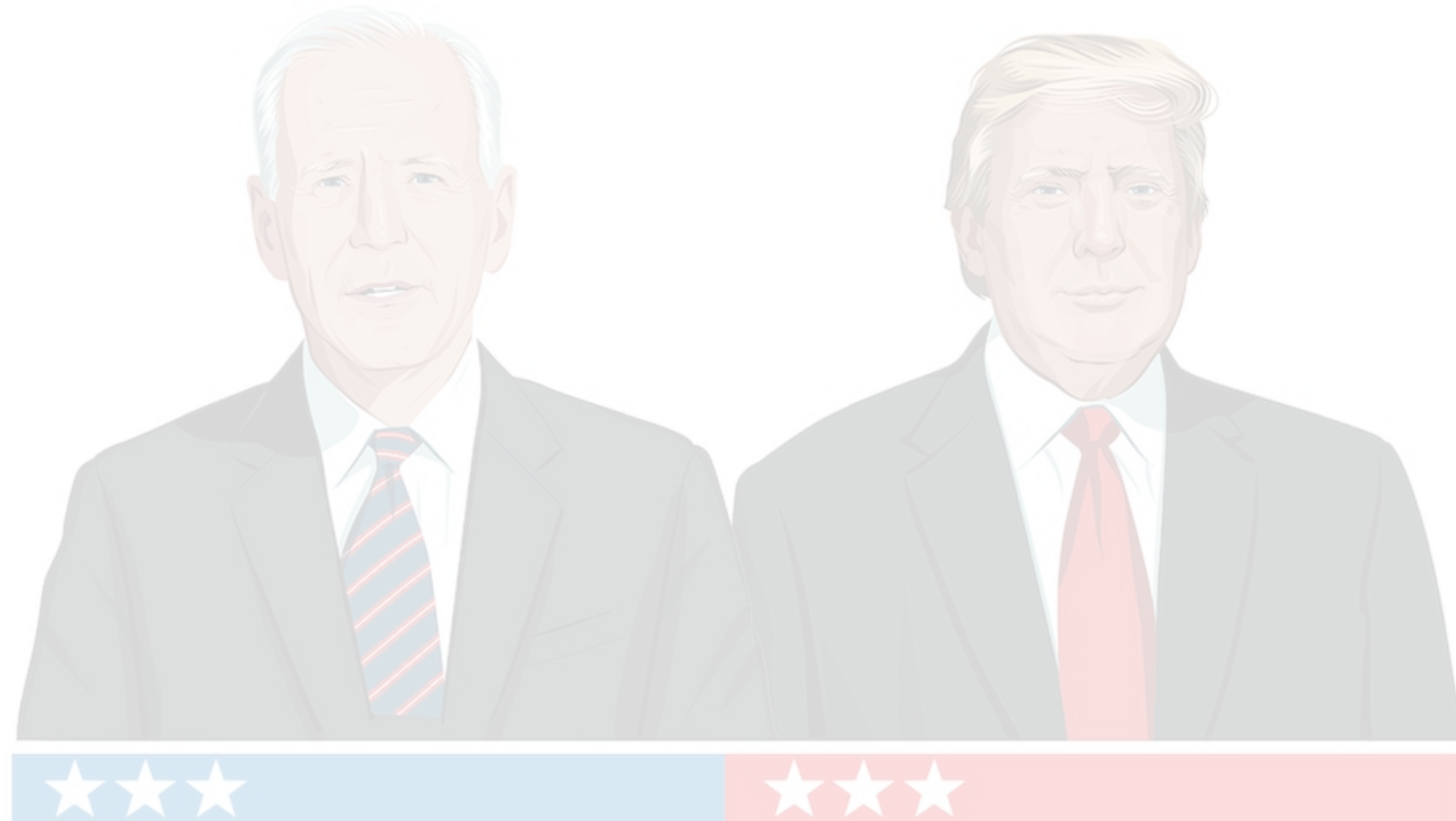
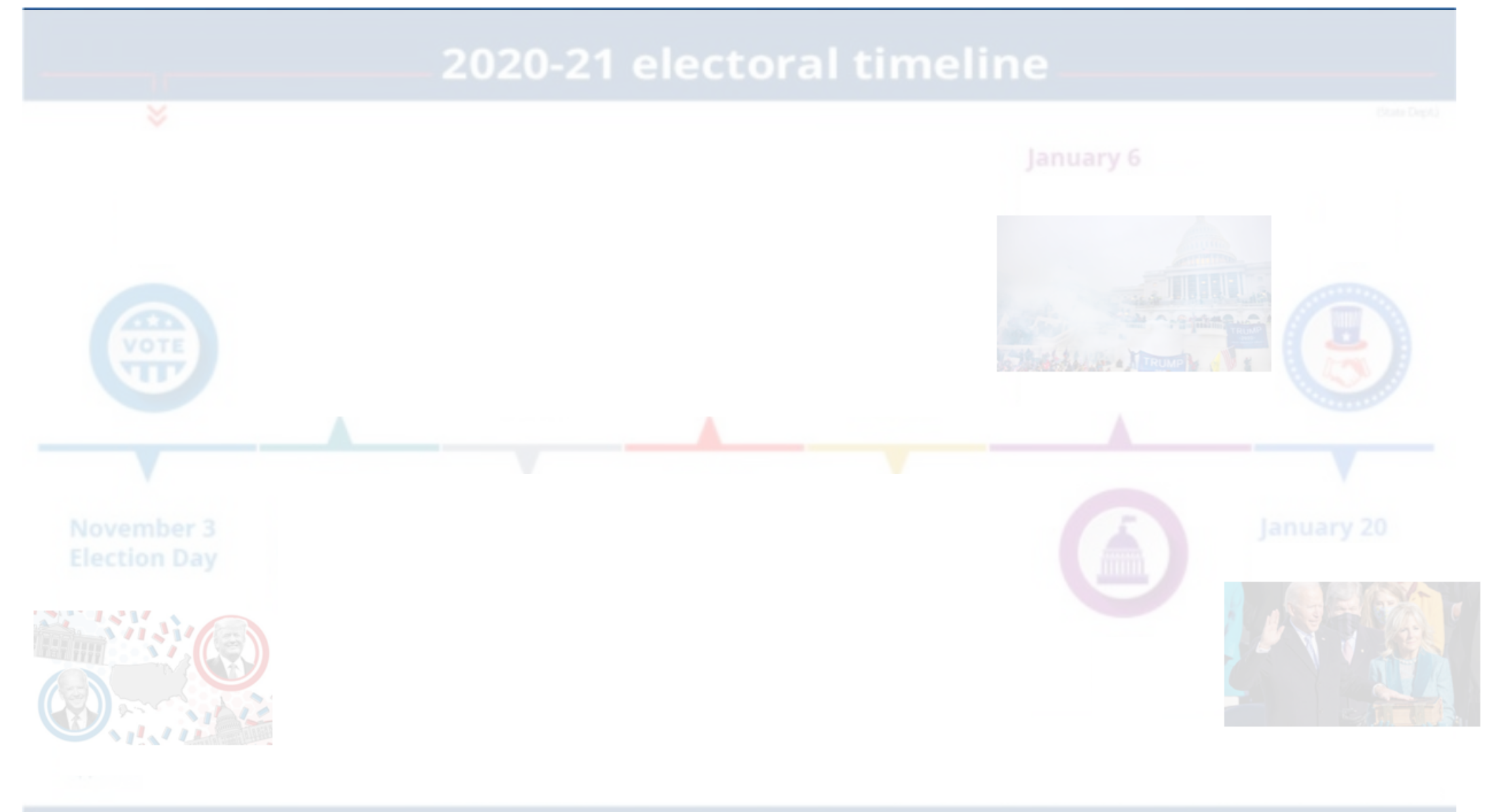


Illustration by Ben Kirchner for The Washington Post

**Period: Sept 2020 - April 2021**



Source: National Archives

**Channels: Left/Right bias rating & engagement**



**Event:** U.S. 2020 presidential elections

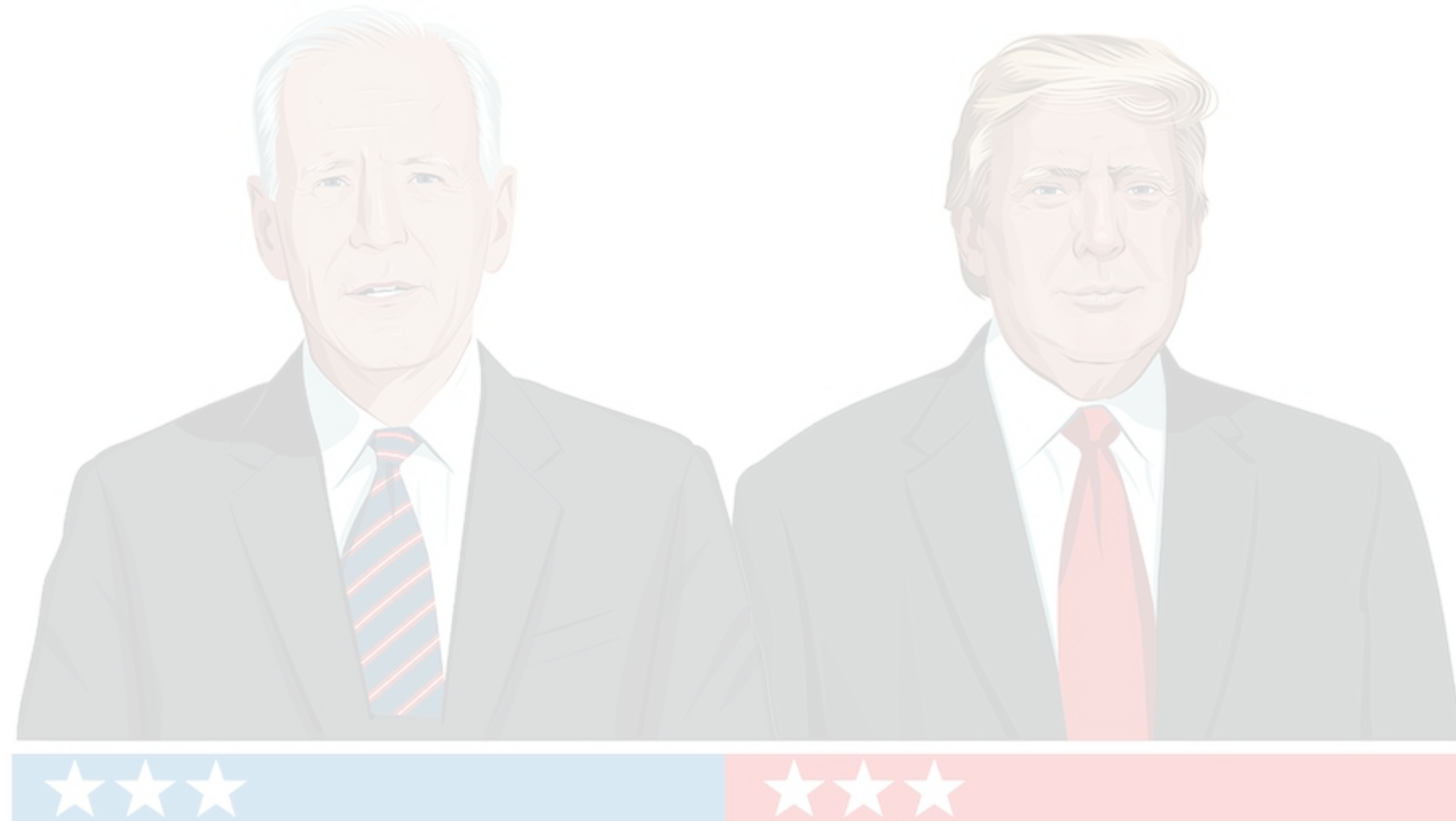
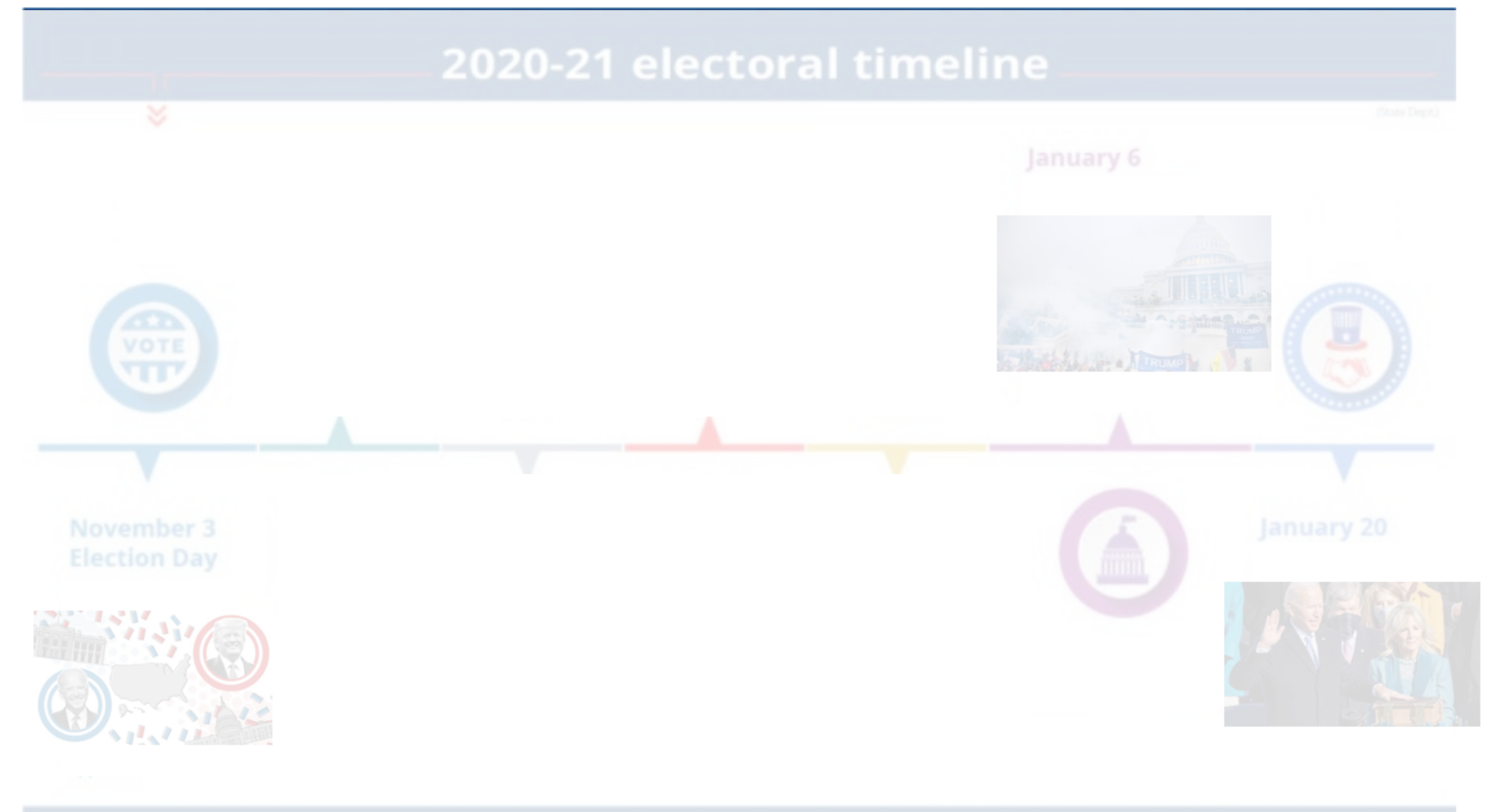
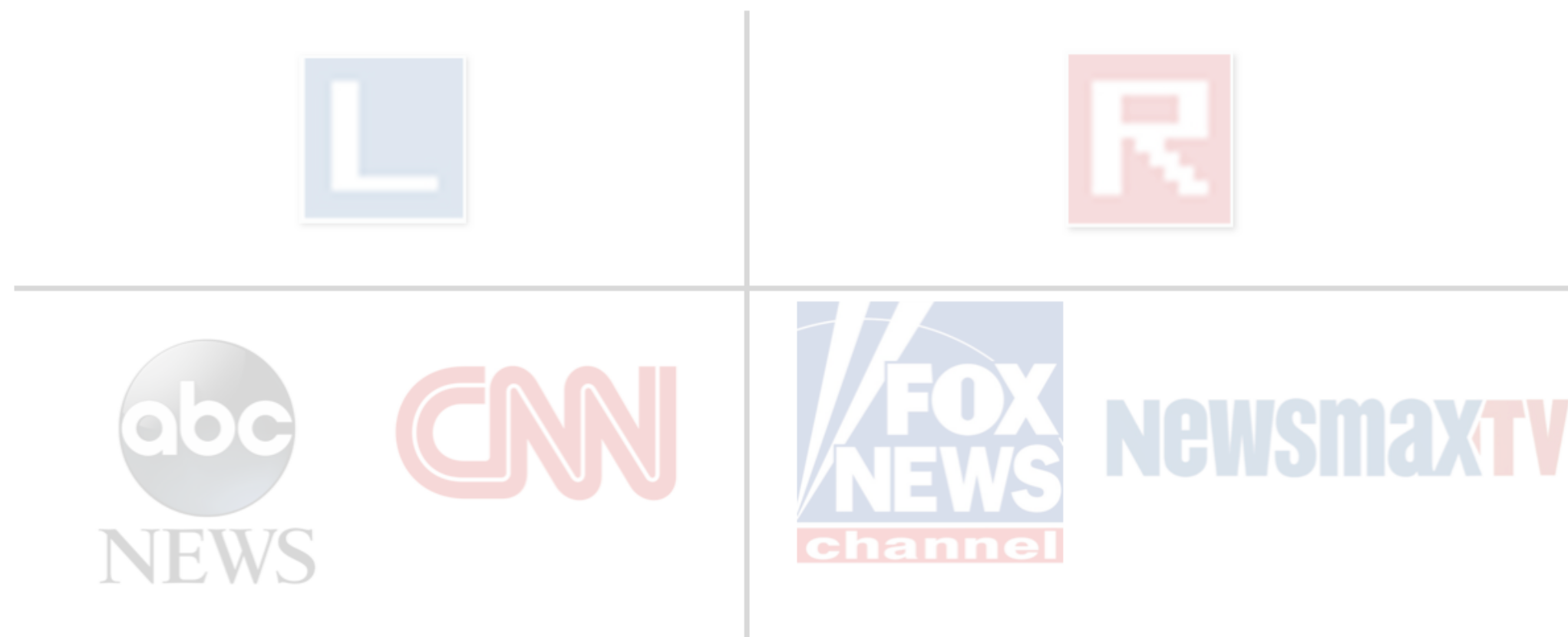


Illustration by Ben Kirchner for The Washington Post

**Period:** Sept 2020 - April 2021



**Channels:** Left/Right bias rating & engagement



<https://www.allsides.com/media-bias>

**Dataset:** 30,000 videos ~40M comments & replies





**When talking about politics **online** and the **conversation** becomes hostile, do users choose silence?**

YouTube ES Search

#CNN #News  
**Watch President Joe Biden's full inauguration speech**  
2,371,214 views 20 Jan 2021 President Joe Biden gives a speech after being sworn in as the 46th President of the United States. ...more

CNN 14.4M subscribers **SUBSCRIBE** Comments 18K Add a comment...

18,897 Comments SORT BY

Add a comment...

1 year ago  
What makes America great are the people who treat each other humanely, despite various different backgrounds. Ideally, that each person has the freedom to pursue their dreams.  
272 REPLY

41 REPLIES

1 year ago  
Amen..  
5 REPLY

1 year ago  
Except if they're conservative.  
11 REPLY

1 year ago  
YES!! ...Unless they sneak into our Country and we're forced to pay for their food and healthcare  
2 REPLY

1 year ago  
Biden's speech has MORE Morality. I Love such soul  
2 REPLY



[parent, reply1, reply2,...]



YouTube ES Search

#CNN #News

### Watch President Joe Biden's full inauguration speech

2,371,214 views 20 Jan 2021 President Joe Biden gives a speech after being sworn in as the 46th President of the United States. ...more

37K Dislike Share Save ...

CNN 14.4M subscribers SUBSCRIBE Comments 18K Add a comment...

18,897 Comments SORT BY

Add a comment...

1 year ago

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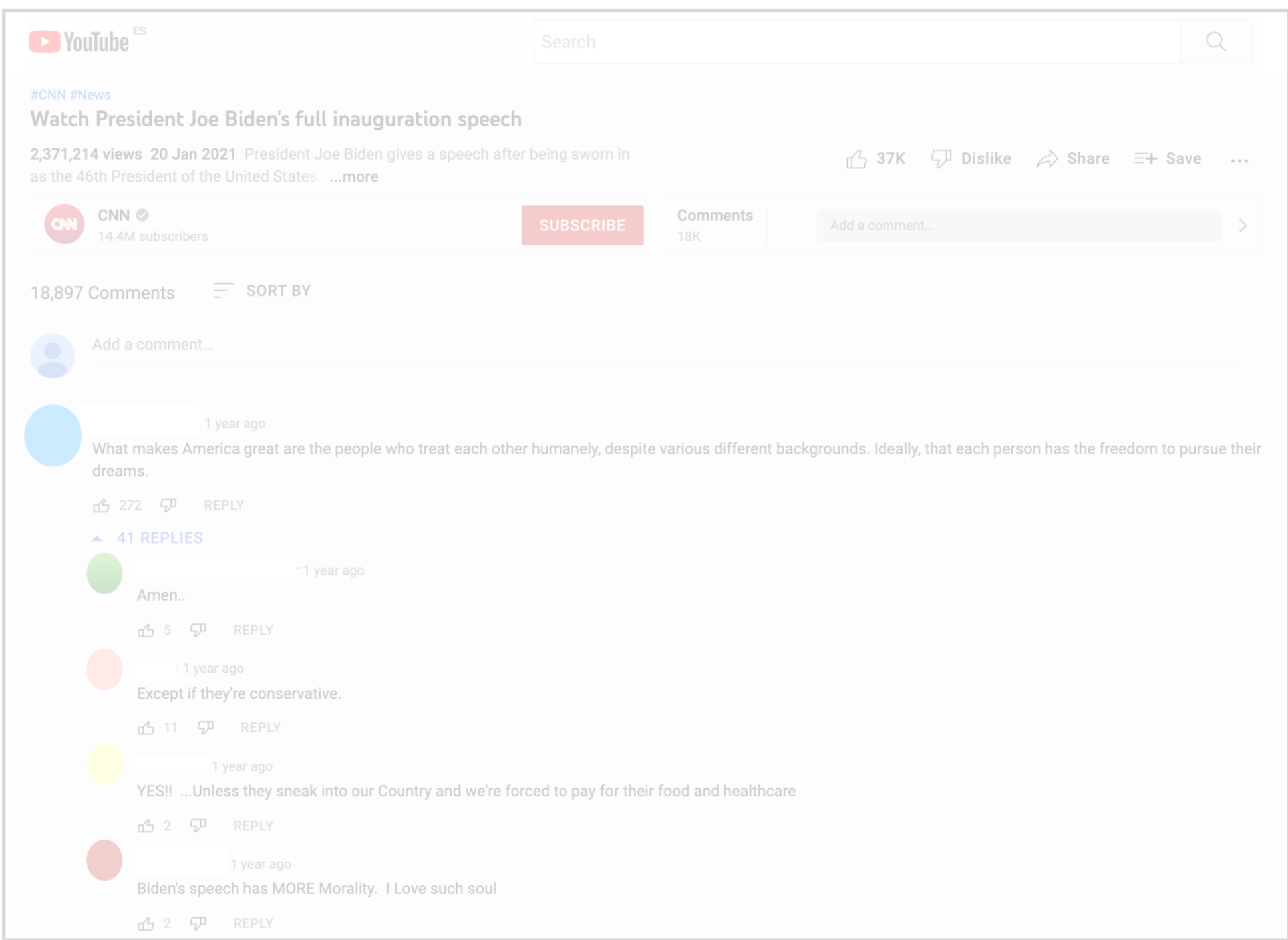
2 REPLY



[parent, reply1, reply2,...]

 **Perspective**

**Toxicity:** “a rude, disrespectful or unreasonable comment that is likely to make people leave a conversation.”



The screenshot shows a YouTube video player interface. At the top, there's a search bar and the YouTube logo. Below that, the video title is "Watch President Joe Biden's full inauguration speech" with 2,371,214 views and a date of 20 Jan 2021. The video is from the channel "CNN" which has 14.4M subscribers. There are 18,897 comments. A comment by a user with a blue profile picture is highlighted, with the text: "What makes America great are the people who treat each other humanely, despite various different backgrounds. Ideally, that each person has the freedom to pursue their dreams." This comment has 272 likes and 41 replies. Below it, several replies are visible, including one that says "Amen..", another that says "Except if they're conservative.", and others with more controversial or inflammatory language.



[parent, reply1, reply2,...]



**Toxicity:** “a rude, disrespectful or unreasonable comment that is likely to make people leave a conversation.”

[toxic, no-Toxic, no-Toxic,...]

[toxic, no-Toxic,..., **END**]



The image shows a screenshot of a YouTube video page. At the top, there is a search bar and the YouTube logo. Below that, the video title is "Watch President Joe Biden's full inauguration speech" with 2,371,214 views and a date of 20 Jan 2021. The video is from the channel "CNN" which has 14.4M subscribers. There are 18,897 comments. A comment by a user with a blue profile picture is highlighted, with the text: "What makes America great are the people who treat each other humanely, despite various different backgrounds. Ideally, that each person has the freedom to pursue their dreams." This comment has 272 likes and 41 replies. Below it, several other replies are visible, including "Amen..", "Except if they're conservative.", "YES!! ...Unless they sneak into our Country and we're forced to pay for their food and healthcare", and "Biden's speech has MORE Morality. I Love such soul".



**[parent, reply1, reply2,...]**

 **Perspective**  
**Toxicity:** “a rude, disrespectful or unreasonable comment that is likely to make people leave a conversation.”

**[toxic, no-Toxic, no-Toxic,...]**

**[toxic, no-Toxic,..., END]**

**[1, 2, 2,...,0]**

**When talking about politics online and the conversation becomes hostile, do users choose **silence**?**



**When talking about politics online and the conversation becomes hostile, do users choose **silence**?**

**[1, 2, 2, ..., 0]**

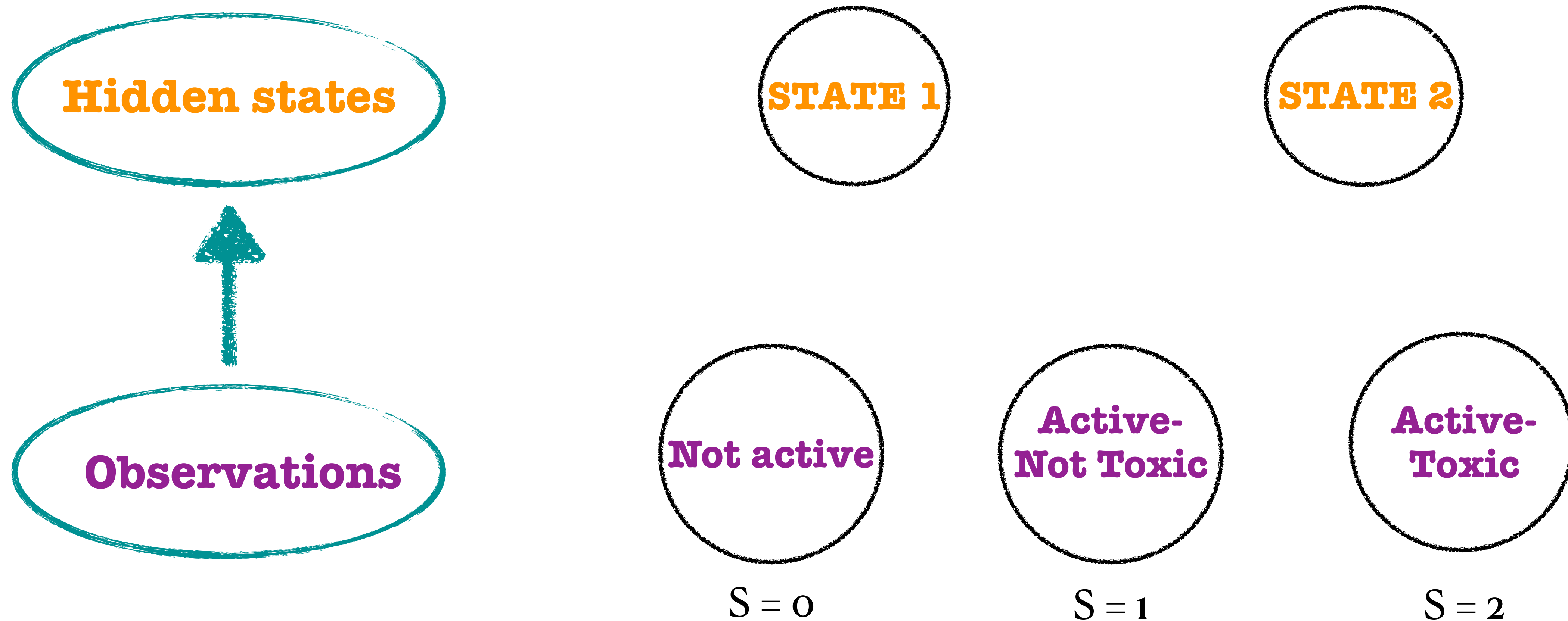
**When talking about politics online and the conversation becomes hostile, do users choose **silence**?**

[1, 2, 2, ..., 0]

**Hidden Markov model:** Given a set of observed conversation sequences, what is the most likely state of the system?

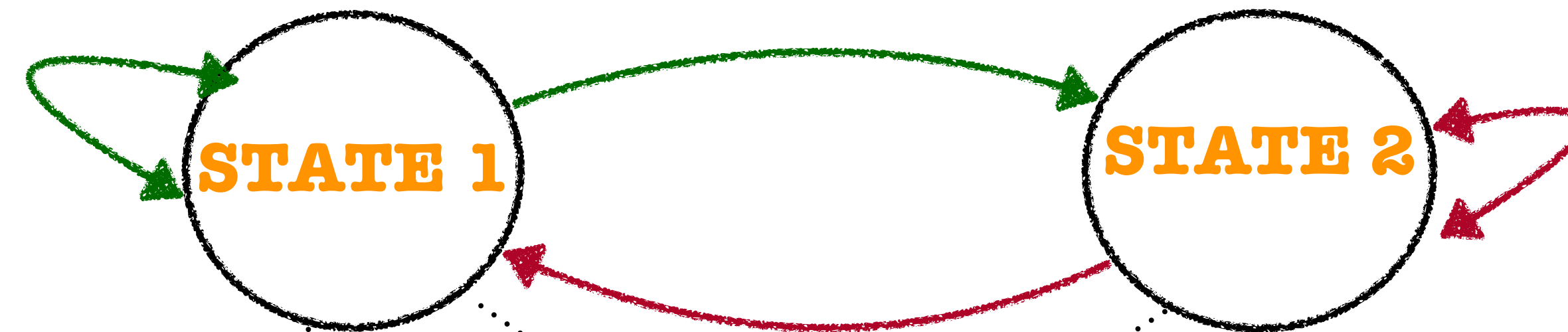


# Hidden Markov model



# Hidden Markov model

**Hidden states**



**Observations**



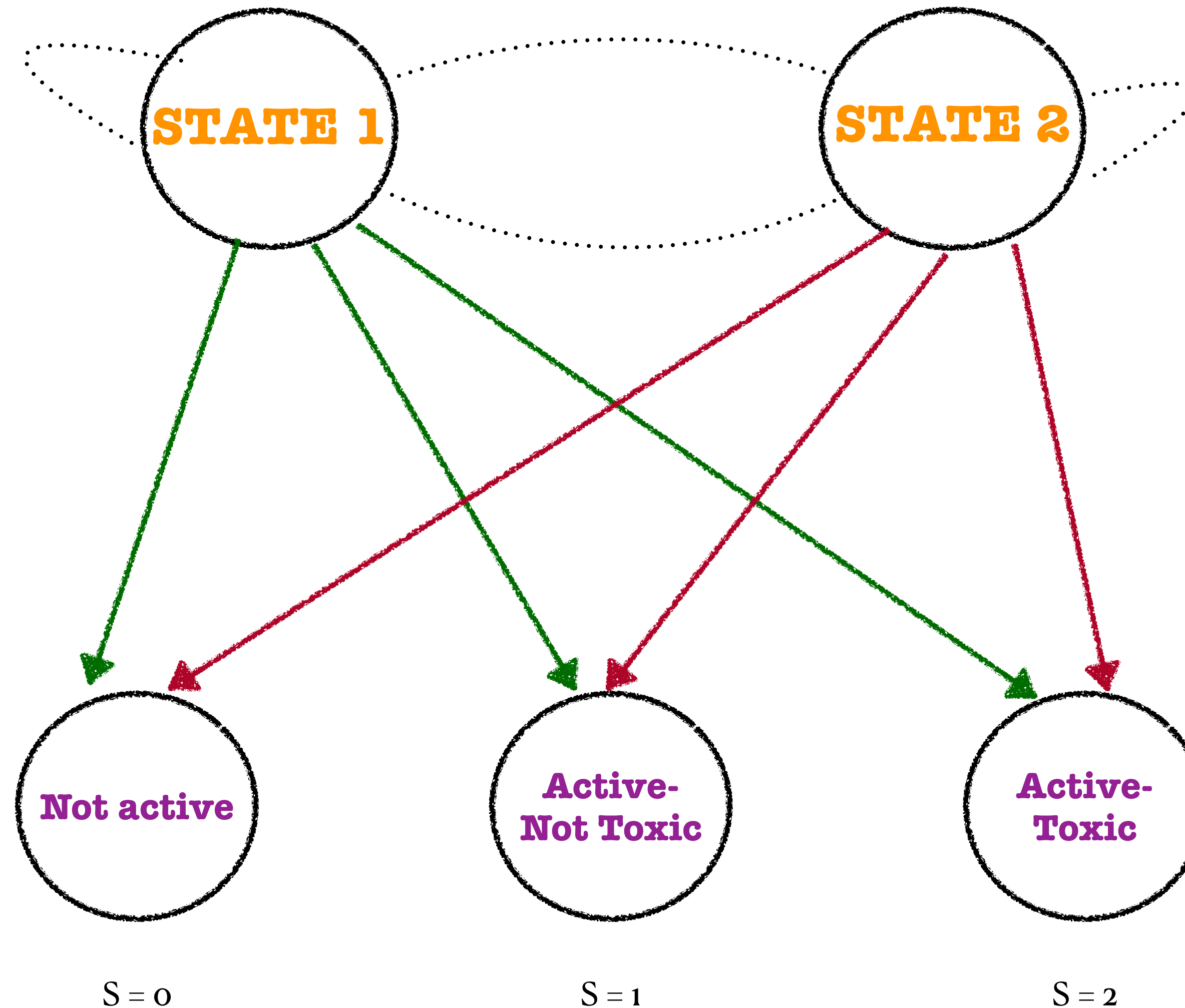
S = 0

S = 1

S = 2

# Hidden Markov model

**Hidden states**

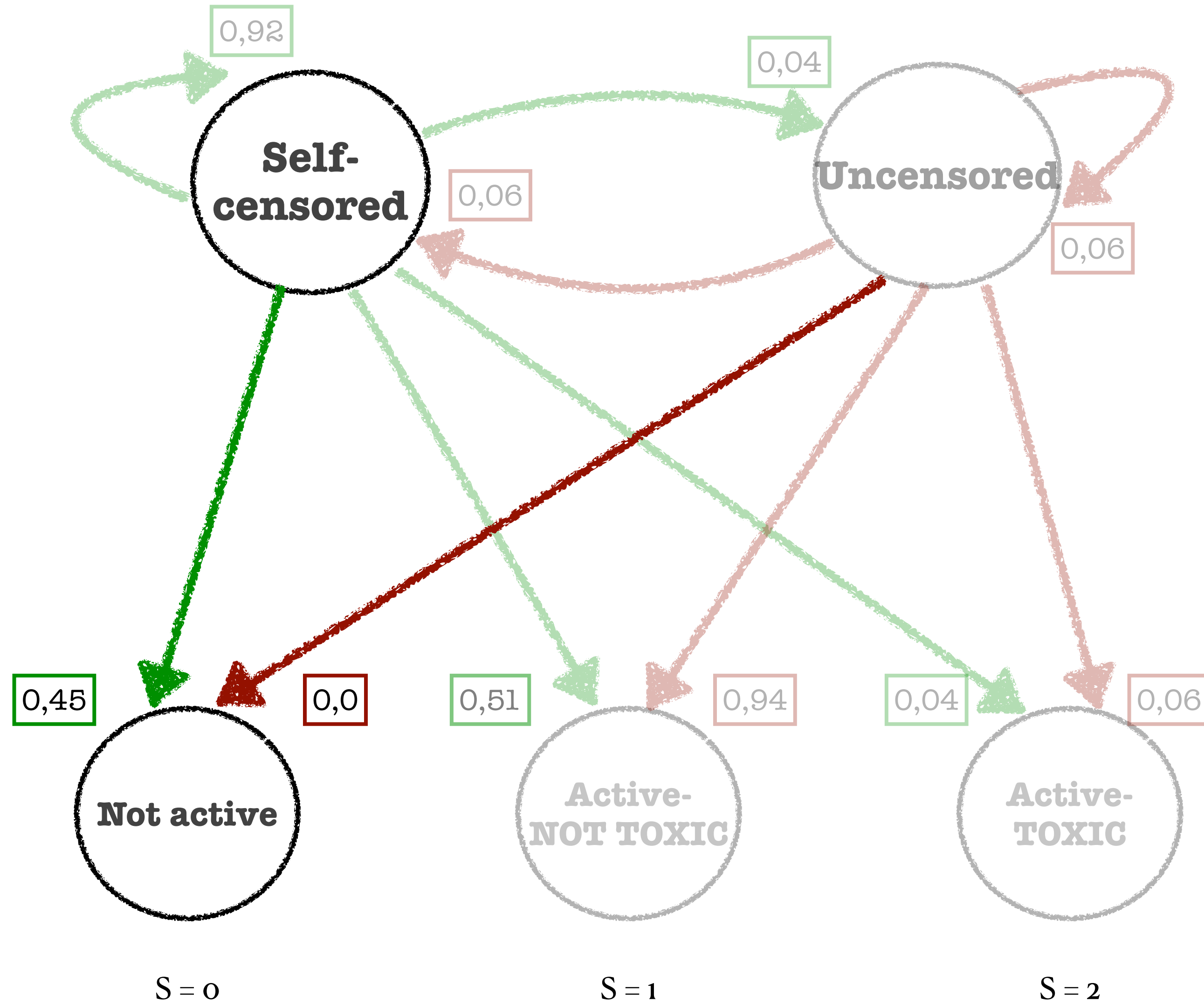


**Observations**



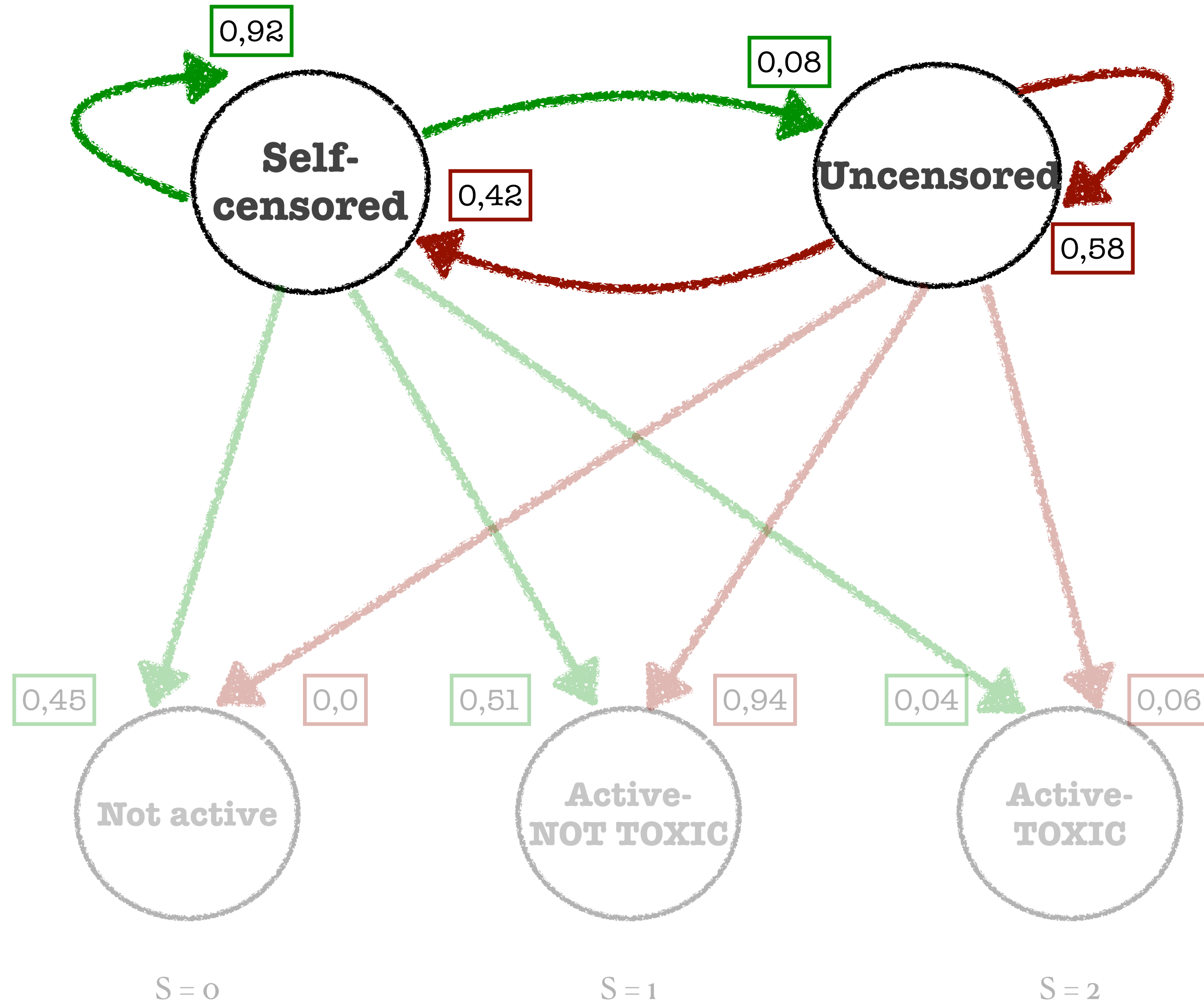
## Result 1

**Self-censored *state*.** Found evidence for a state coherent with a silencing strategy



### EMISSION MATRIX

	NoAct	Act NoToxic	Act Toxic
Self-censored	0,445	0,510	0,044
Uncensored	0,0	0,939	0,061



### TRANSMISSION MATRIX

	Self-censored	Uncensored
Self-censored	0,921	0,079
Uncensored	0,422	0,578





Not Active    Act NotToxic    Act Toxic

Not Active    Act NotToxic    Act Toxic

Not Active    Act NotToxic    Act Toxic

Not Active    Act NotToxic    Act Toxic

Self-censored

<b>0,45</b>	0,51	0,04
<b>0,0</b>	0,94	0,06

<b>0,33</b>	0,58	0,09
<b>0,0</b>	0,95	0,04

<b>0,33</b>	0,60	0,07
<b>0,0</b>	0,96	0,04

<b>0,45</b>	0,51	0,04
<b>0,0</b>	0,97	0,03

Uncensored



**Spiral of Silence theory:** Individual & network effects — fear of isolation motivates to conceal true opinions (Hayes and Matthes, 2017)



## Result 2

In some contexts, the self-censored state is a state  
of **extremes**



# Odds of posting toxic activity when self-censored is not consistently $< 1$



**0,65**



**2,37**



**1,81**



**1,35**

Not Active    Act Not Toxic    **Act Toxic**

Not Active    Act Not Toxic    **Act Toxic**

Not Active    Act Not Toxic    **Act Toxic**

Not Active    Act Not Toxic    **Act Toxic**

**Self-censored**

0,45	0,51	<b>0,04</b>
0,0	0,94	<b>0,06</b>

0,33	0,58	<b>0,09</b>
0,0	0,95	<b>0,04</b>

0,33	0,60	<b>0,07</b>
0,0	0,96	<b>0,04</b>

0,45	0,51	<b>0,04</b>
0,0	0,97	<b>0,03</b>

**Uncensored**



# Contextual triggers: Influenced into anti-social behaviour

Cheng et al. (2017), Kim et al. (2021)





# When talking about politics online and the conversation becomes hostile, do users choose silence?

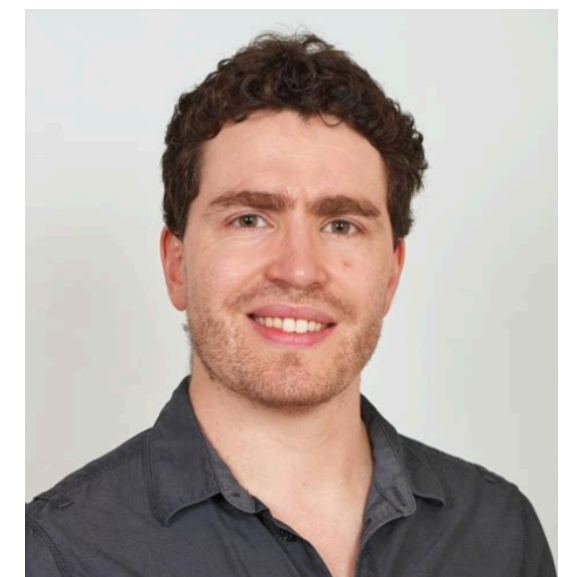
- Identified a state coherent with a silencing strategy, self-censored state
- The self-censored state is more likely to produce toxic content



Taha Yasseri (UCD)



Júlia Koltai (ELTE)



Gerardo Iñiguez (CEU)

**Pre-print access:**

[juncosa\\_maria@phd.ceu.edu](mailto:juncosa_maria@phd.ceu.edu)



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