

The Rhythms of the Night & Junk News Bubbles

Tommaso Venturini (CNRS Centre Internet et Société)

www.tommasoventurini.it

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COVID-19 e-print

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[Submitted on 18 Jul 2020 (v1), last revised 26 Jul 2020 (this version, v2)]

The Rhythms of the Night: increase in online night activity and emotional resilience during the Covid-19 lockdown

Maria Castaldo, Tommaso Venturini, Paolo Frasca, Floriana Gargiulo

Context: The lockdown orders established in multiple countries in response to the Covid-19 pandemics are perhaps the widest and deepest shock experienced by human behaviors in recent years. Studying the impact of the lockdown, through the lens of social media, offers an unprecedented opportunity for analyzing the susceptibility and the resilience of circadian rhythms to large-scale exogenous shocks. In this context, we address two interconnected research questions: Can variations of online activity cycles provide information on the impact of lockdown on human activities? How do online circadian rhythms react to such a disruption? Data: We base our research on the analysis and comparison of two independent databases about the French cyberspace: a fine-grained temporal record of YouTube videos and a large collection of Tweets on {Covid-19}. Findings: In both datasets we observe a reshaping of the circadian rhythms with a substantial increase of night activity during the lockdown. The analysis of the videos and tweets published during lockdown shows a general decrease in emotional contents and a shift from themes like work and money to themes like death and safety. However, the daily patterns of emotions remain mostly unchanged, thereby suggesting that emotional cycles are resilient to exogenous shocks.

Subjects: **Physics and Society (physics.soc-ph)**; Social and Information Networks (cs.SI)
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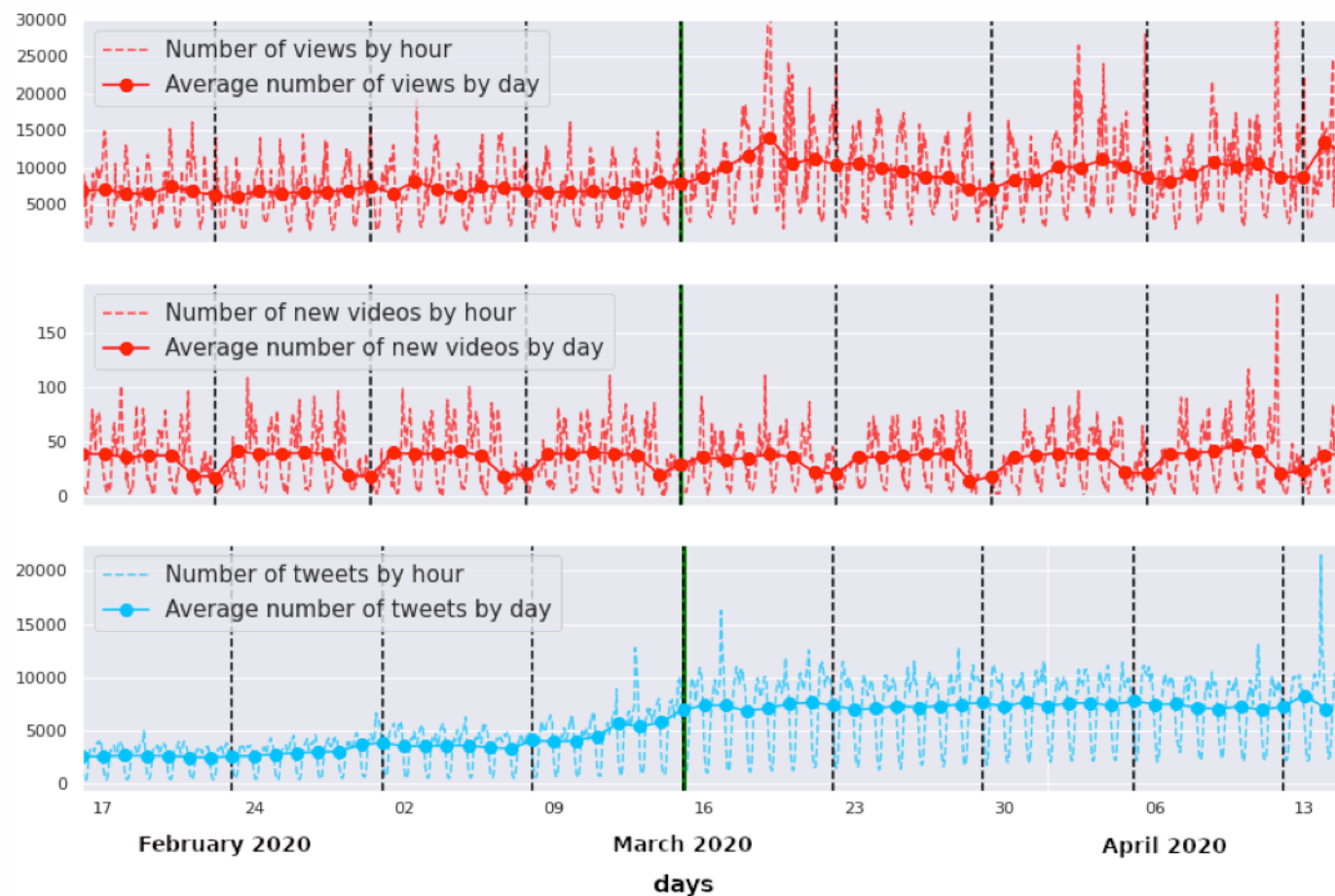
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Confinement: la revanche du poisson rouge
F.Ozda

March 17th, France goes into lockdown



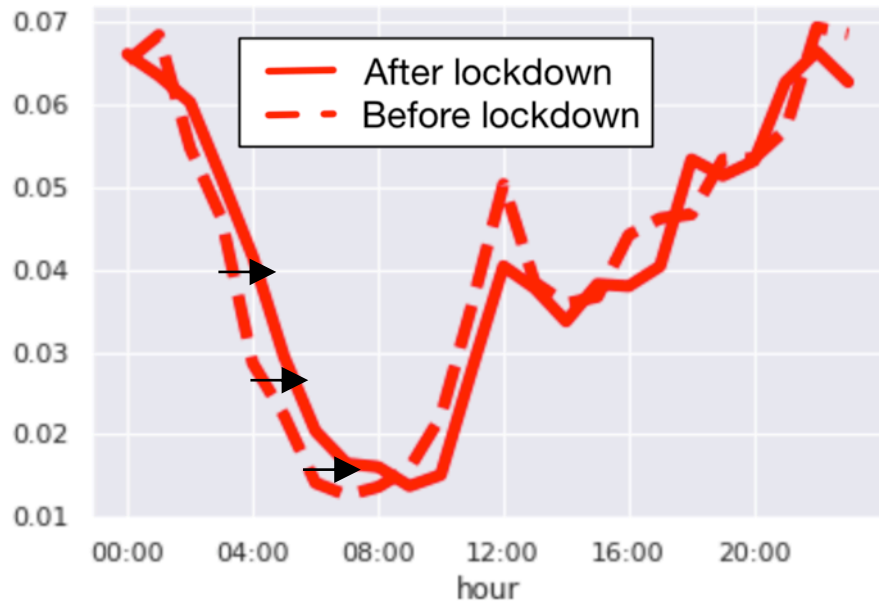
+ YouTube watching

= YouTube publishing

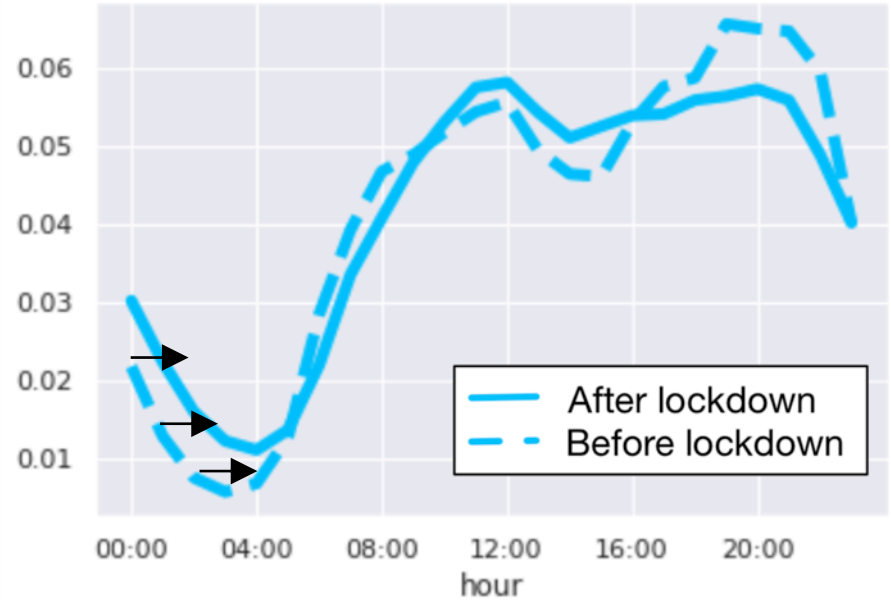
+ tweeting

... and French people go online

Normalized frequencies



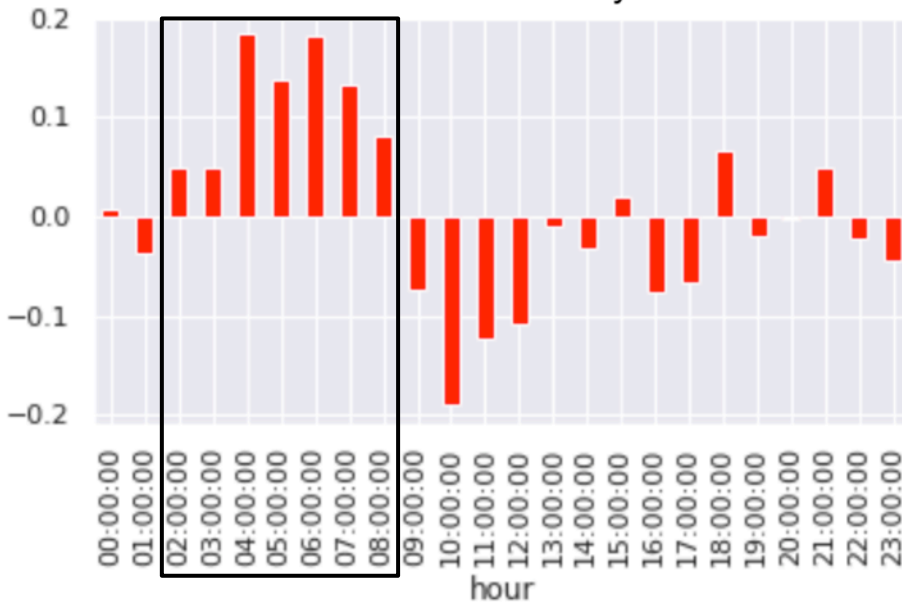
Normalized frequencies



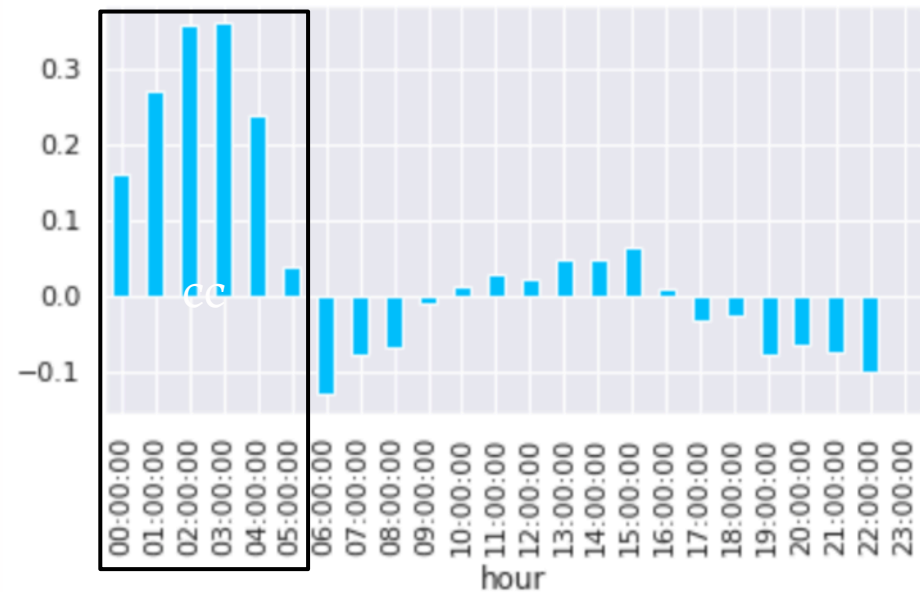
... through the night

$$\delta(h) = \frac{f^{\text{after}}(h) - f^{\text{before}}(h)}{f^{\text{after}}(h) + f^{\text{before}}(h)}$$

Relative difference by hour

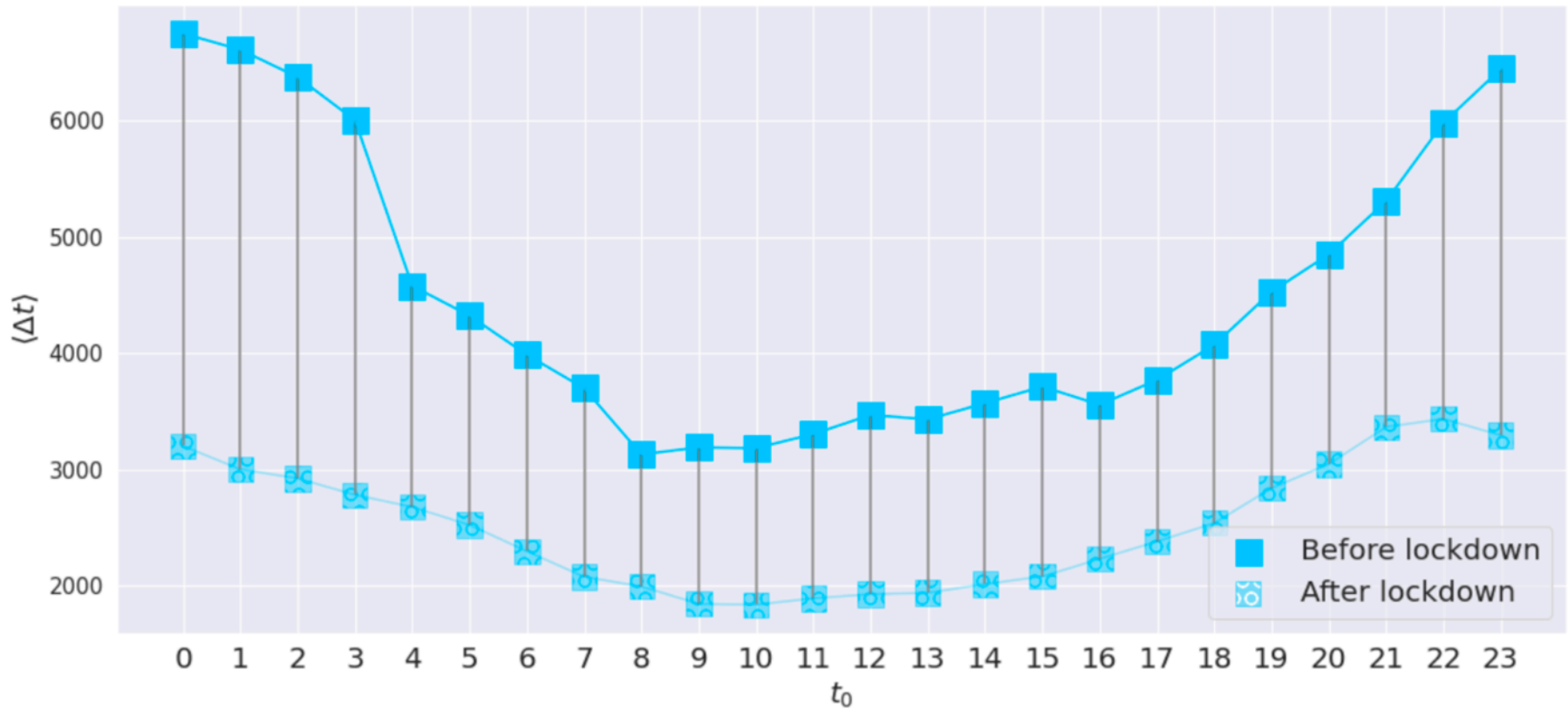


Relative difference by hour

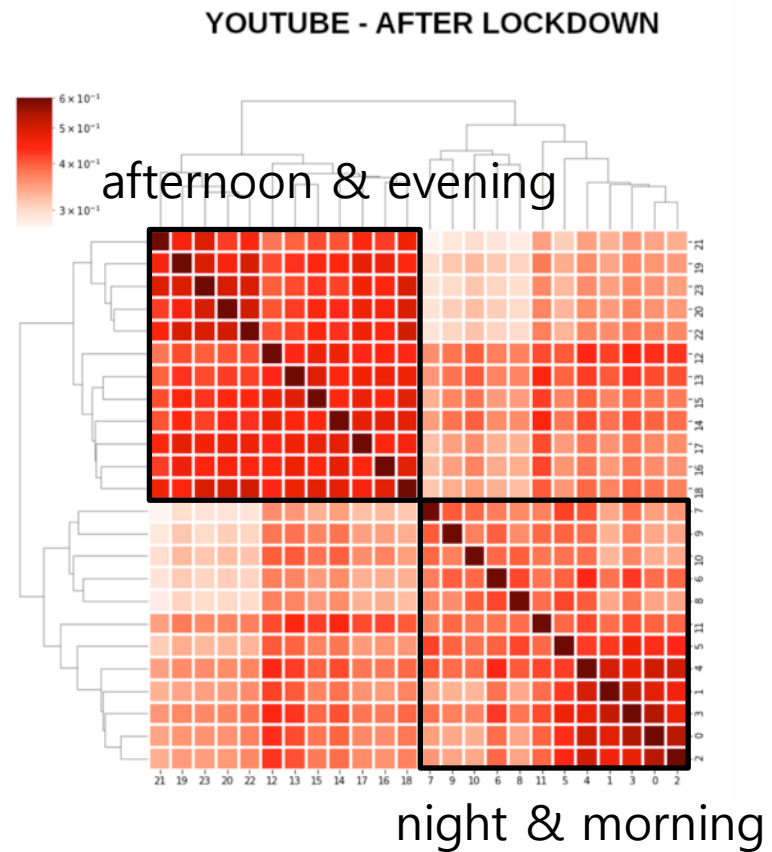
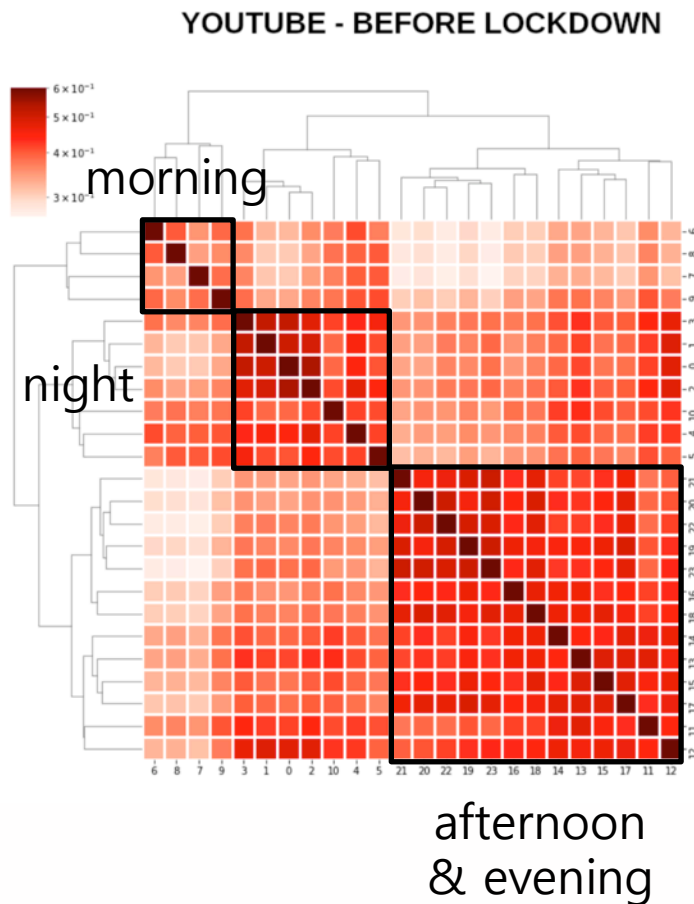


... through the night

average time lag between two consecutive Tweets (in seconds)

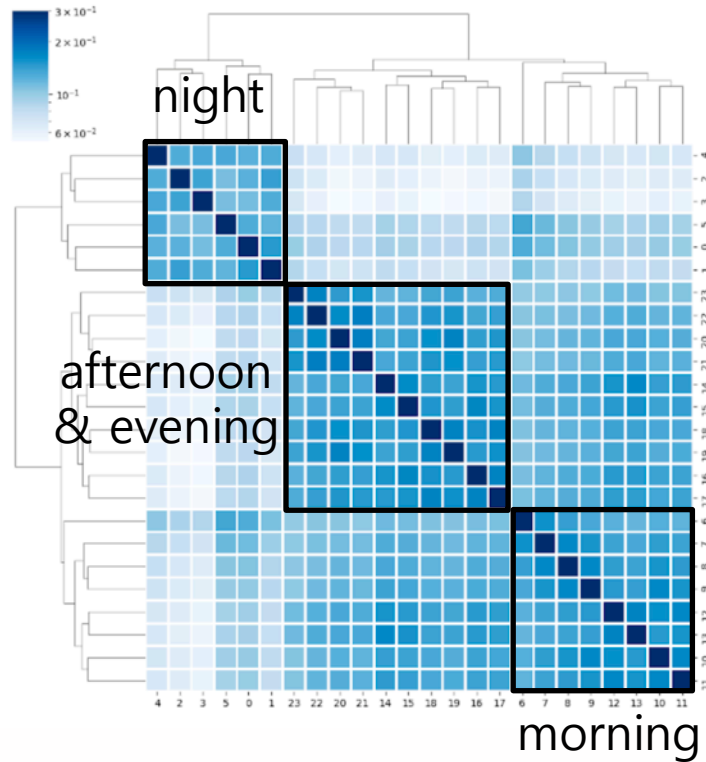


with shorter sleeping breaks

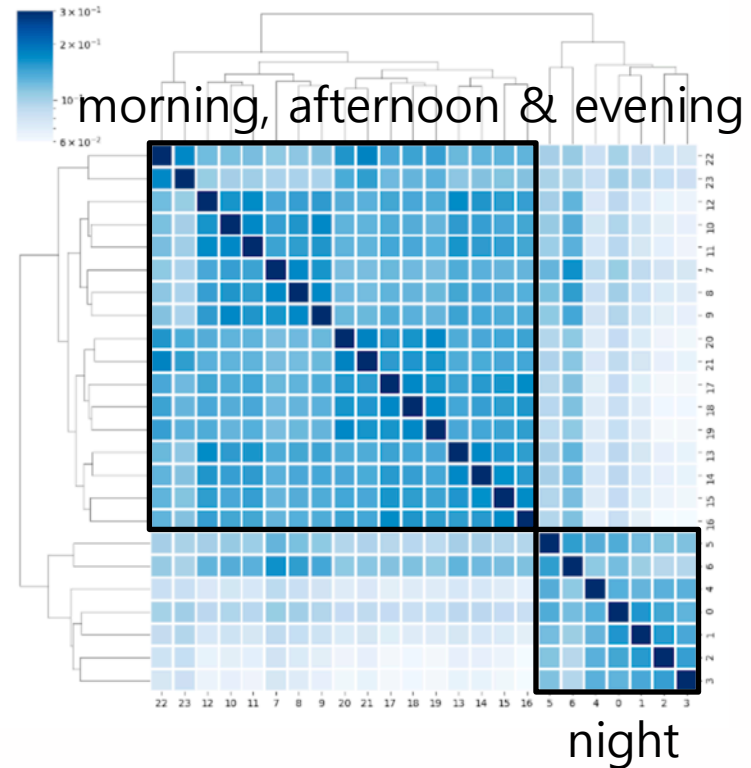


Morning merged into the night
(in YouTube)

TWITTER - BEFORE LOCKDOWN

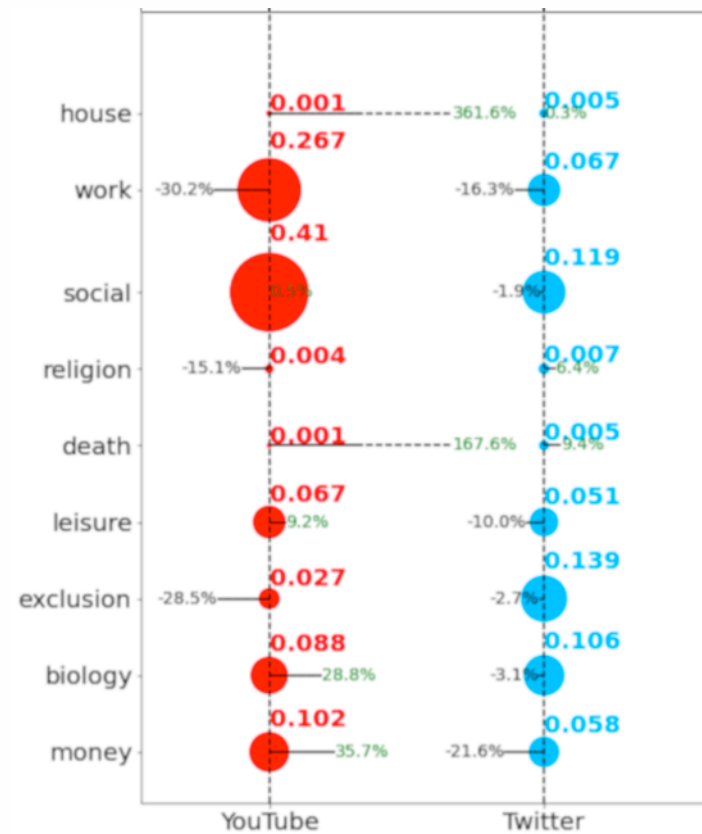
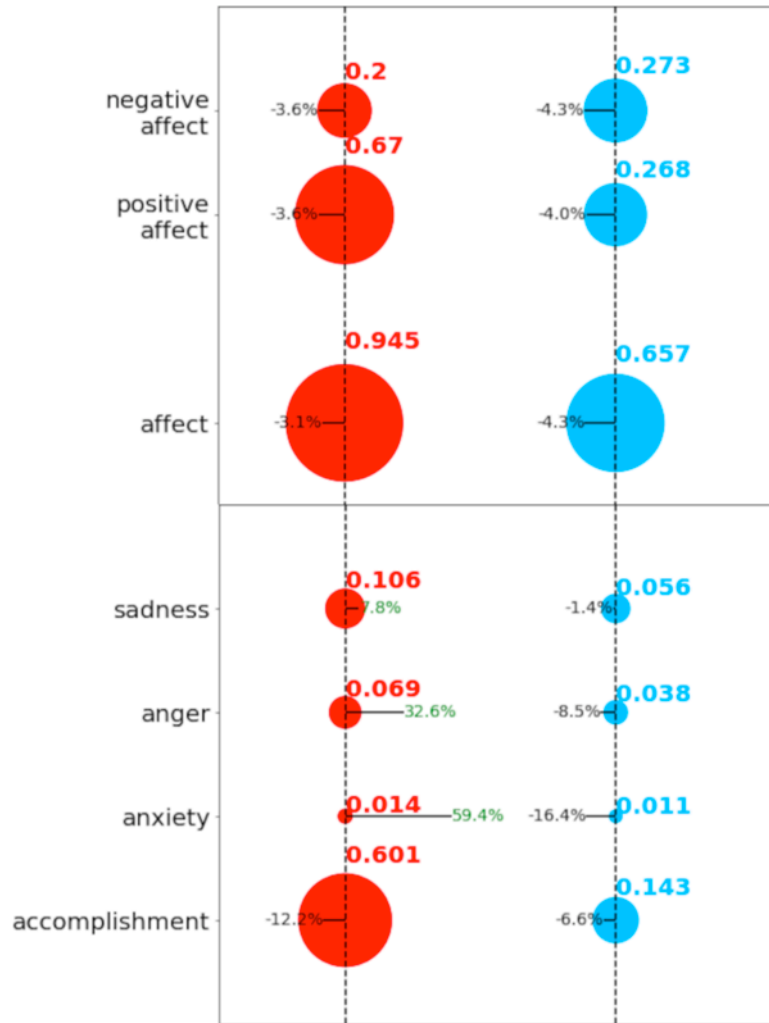


TWITTER - AFTER LOCKDOWN



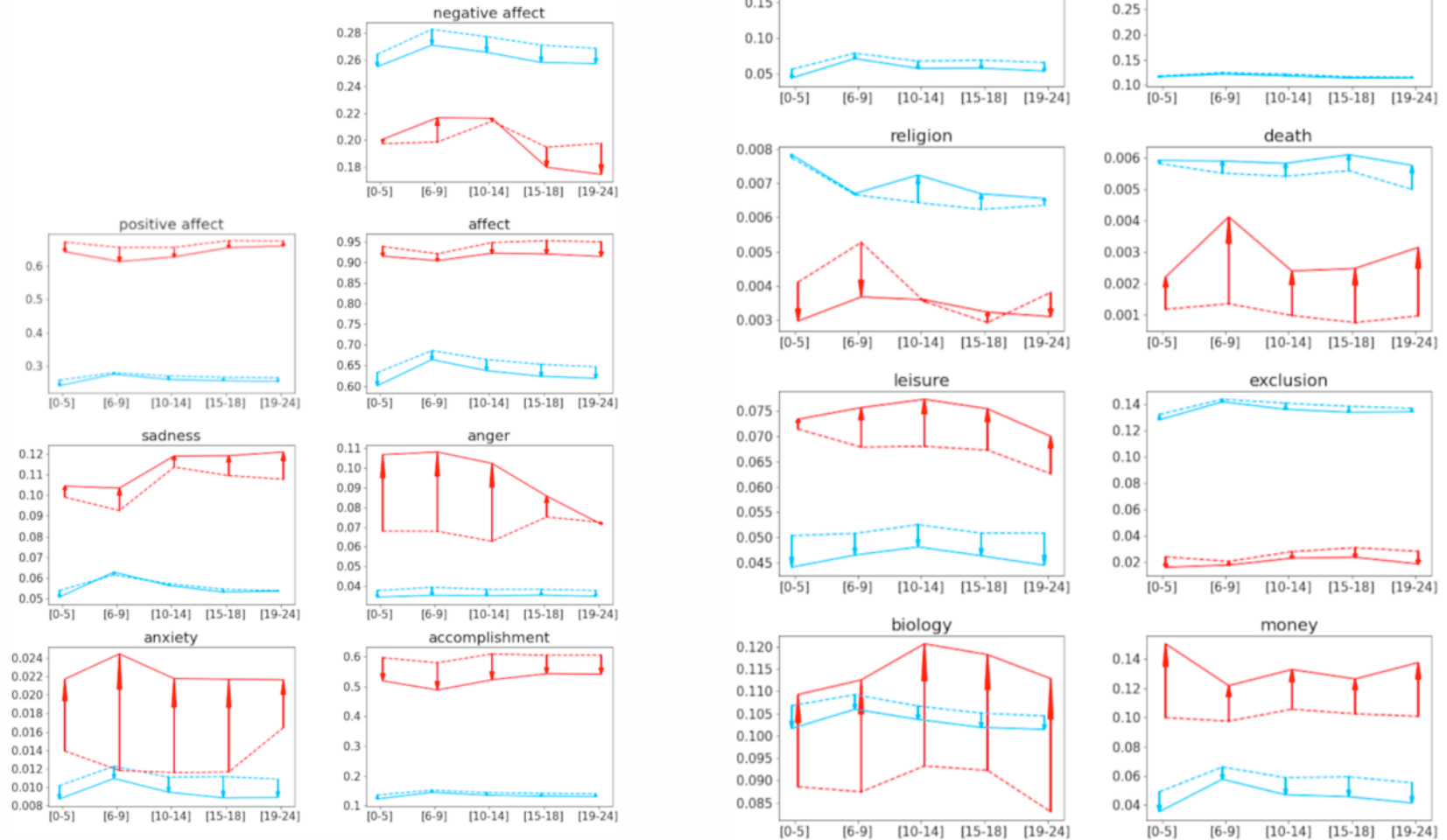
Morning merged into the day
(in Twitter)

Fraction of video views and tweets per category and relative change after the lockdown



Emotional resilience

Hourly distribution change of video views and tweets per category



Emotional resilience
(temporally stable)

The Rhythms of the Night
&
Junk News Bubbles

FROM FAKE TO JUNK NEWS

The data politics of online virality

Tommaso Venturini

“Fake news” is a key subject of data politics, but also a tricky one. As this chapter aims to show, the various phenomena signified by this misleading label have little in common, except being opposite to the kind of algorithmic intelligence that most other chapters present as the main concern of data politics. This does not mean that “fake news” is not related to computational analytics or political intentions, but it does mean that this relation is not straightforward.

To discuss this relation, I will go through a three-stage argument. First, I will criticise the notion of “fake news”, dismissing the idea that this type of misinformation can be defined by its relationship to truth. Second, I will propose a different definition of this phenomenon based on its circulation rather than of its contents. Third, I will reintroduce the connection to data politics, by describing the economic, communicational, technological, cultural and political dimensions of junk news.

Junk news is not about algorithmic persuasion

“From Fake to Junk News, the Data Politics of Online Virality.”
In *Data Politics: Worlds, Subjects, Rights*, eds. Didier Bigo,
Engin Isin, and Evelyn Ruppert. London: Routledge, 123–44.

What we are considering here, however, are the psychic and social consequences of the designs or patterns as they amplify or accelerate existing processes. For the "message" of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs.

The railway did not introduce movement or transportation or wheel or road into human society, but it accelerated and enlarged the scale of previous human functions, creating totally new kinds of cities and new kinds of work and leisure.

McLuhan, Marshall. 1964. *Understanding Media: The Extensions of Man*. New York: McGraw-Hill.



*"It isn't that I don't like current events.
There have just been so many of them lately."*

McLuhan, Marshall, and Quentin Fiore. 1967. *The Medium Is the Massage*. Gingko Press.

Media acceleration & amplification

**hits&likes
economy**

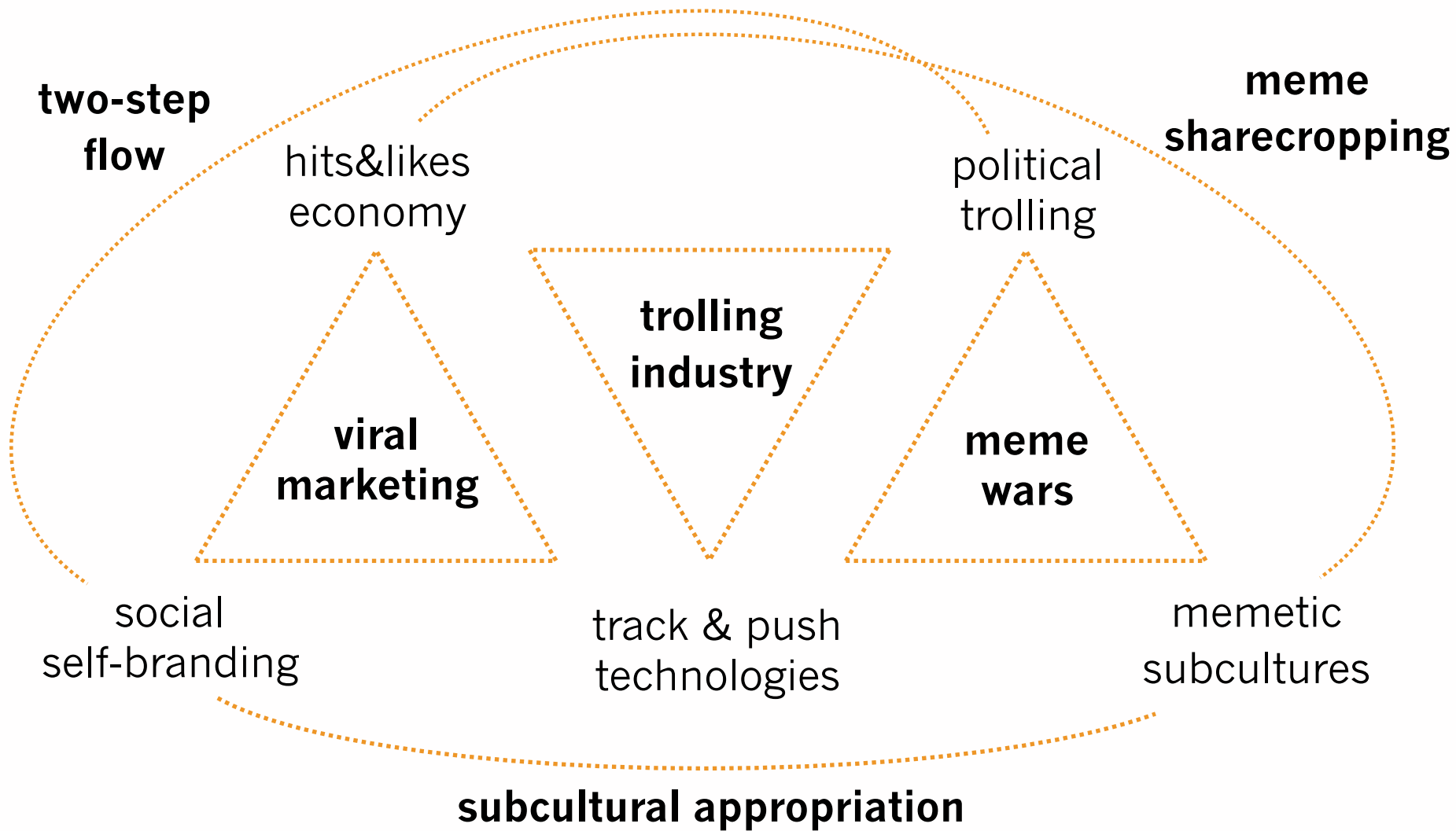
**political
trolling**

**social
self-branding**

**track & push
technologies**

**memetic
subcultures**

attention hypersynchronization
5 sources...



attention hypersynchronization
5 sources... and their interactions

What we are considering here, however, are the psychic and social consequences of the designs or patterns as they amplify or accelerate existing processes. For the "message" of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs.

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Epilepsy

From Wikipedia, the free encyclopedia

"Epilepsia" and "Epileptic" redirect here. For the journal, see [Epilepsia \(journal\)](#). For the novel, see [Epileptic \(graphic novel\)](#).

Epilepsy is a group of **neurological disorders** characterized by recurrent **epileptic seizures**.^{[10][11]} Epileptic seizures are episodes that can vary from brief and nearly undetectable periods to long periods of vigorous shaking.^[1] These episodes can result in physical injuries, including occasionally **broken bones**.^[1] In epilepsy, seizures have a tendency to recur and, as a rule, have no immediate underlying cause.^[10] Isolated seizures that are provoked by a specific cause such as poisoning are not deemed to represent epilepsy.^[12] People with epilepsy may be treated differently in various areas of the world and experience varying degrees of **social stigma** due to their condition.^[1]

The underlying mechanism of epileptic seizures is excessive and abnormal **neuronal** activity in the **cortex of the brain**.^[12] The reason this occurs in most cases of epilepsy is unknown.^[1]



Hypersynchronization as a
increase of scale *and* pace

Computer Science > Social and Information Networks

[Submitted on 19 Apr 2020]

Junk News Bubbles: Modelling the Rise and Fall of Attention in Online Arenas

Maria Castaldo, Tommaso Venturini, Paolo Frasca

In this paper, we present a type of media disorder which we call "junk news bubbles" and which derives from the effort invested by online platforms and their users to identify and share contents with rising popularity. Such emphasis on trending matters, we claim, can have two detrimental effects on public debates: first, it shortens the amount of time available to discuss each matter; second it increases the ephemeral concentration of media attention. We provide a formal description of the dynamic of junk news bubbles, through a mathematical exploration the famous "public arenas model" developed by Hilgartner and Bosk in 1988. Our objective is to describe the dynamics of the junk news bubbles as precisely as possible to facilitate its further investigation with empirical data.

Comments: Submitted as journal publication

Subjects: **Social and Information Networks (cs.SI)**

Cite as: [arXiv:2004.08863 \[cs.SI\]](#)
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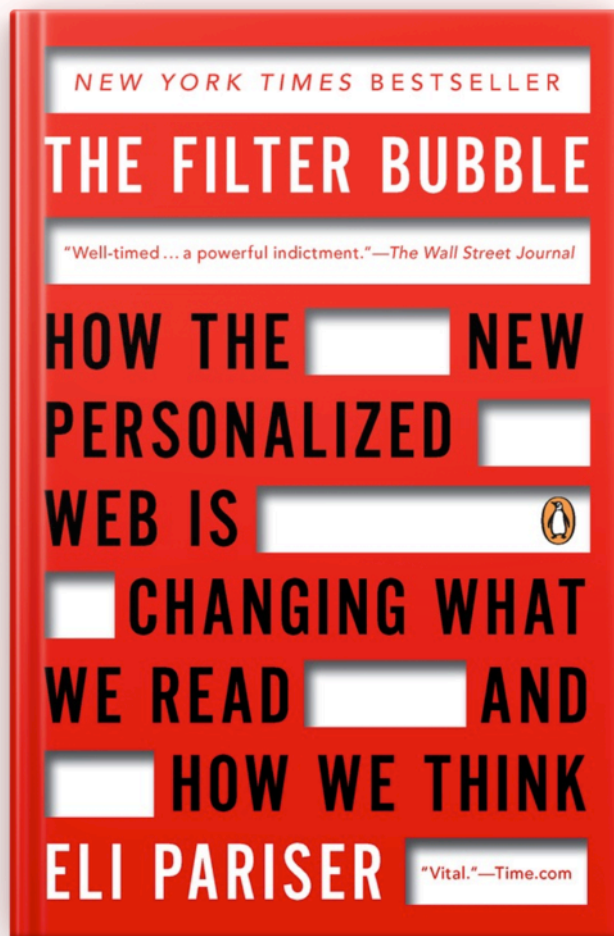
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junk news bubbles

an attention regime in which few items attracts a large share of attention but are incapable of sustaining it for a long time

Eli Pariser. 2011. *The Filter Bubble*



The trending bubble of junk contents

The Rise and Fall of Social Problems: A Public Arenas Model¹

Stephen Hilgartner
Columbia University

Charles L. Bosk
University of Pennsylvania

This paper develops a model of the process through which social problems rise and fall. Treating public attention as a scarce resource, the model emphasizes competition and selection in the media and other arenas of public discourse. Linkages among public arenas produce feedback that drives the growth of social problems. Growth is constrained by the finite “carrying capacities” of public arenas, by competition, and by the need for sustained drama. The tension between the constraints and forces for growth produces successive waves of problem definitions, as problems and those who promote them compete to enter and to remain on the public agenda. Suggestions for empirical tests of the model are specified.

In its most schematic form, our model has six main elements:

2. the institutional arenas that serve as “environments” where social problems compete for attention and grow;
3. the “carrying capacities” of these arenas, which limit the number of problems that can gain widespread attention at one time;
4. the “principles of selection,” or institutional, political, and cultural factors that influence the probability of survival of competing problem formulations;
1. a dynamic process of competition among the members of a very large “population” of social problem claims;⁵
5. patterns of interaction among the different arenas, such as feedback and synergy, through which activities in each arena spread throughout the others; and
6. the networks of operatives who promote and attempt to control particular problems and whose channels of communication crisscross the different arenas.

Hilgartner, S. & Bosk, C. 1988
The Rise and Fall of Social Problems: A Public Arenas Model
American Journal of Sociology 94 (1)

Popularity (π) of each issues (i) is incremented at each time (t) by

its increment of t-1 multiplied by α

$x \sim \mathcal{N}(0, 1/2n)$
plus a random factor (x)

$$\hat{\pi}_{t+1}^i = \max(\pi_t^i + \alpha(\pi_t^i - \pi_{t-1}^i) + x, 0)$$

If negative, the new popularity is set to zero

$$\pi_t^i = \frac{\hat{\pi}_t^i}{\sum_j \hat{\pi}_t^j}$$

After increment, the popularity (π) of each issues (i) is divided by the sum of all popularities so that they sum is always 1

A junk news bubble toy-model

Popularity (π) of each issues (i) is incremented at each time (t) by

its increment of t-1 multiplied by α

$x \sim \mathcal{N}(0, 1/2n)$
plus a random factor (x)

$$\hat{\pi}_{t+1}^i = \max(\underbrace{\pi_t^i}_{\text{current popularity}} + \underbrace{\alpha(\pi_t^i - \pi_{t-1}^i)}_{\text{increment of t-1 multiplied by } \alpha} + \underbrace{x}_{\text{random factor}}, 0)$$

1. Boost of trending topics

If negative, the new popularity is set to zero

2. No negative attention

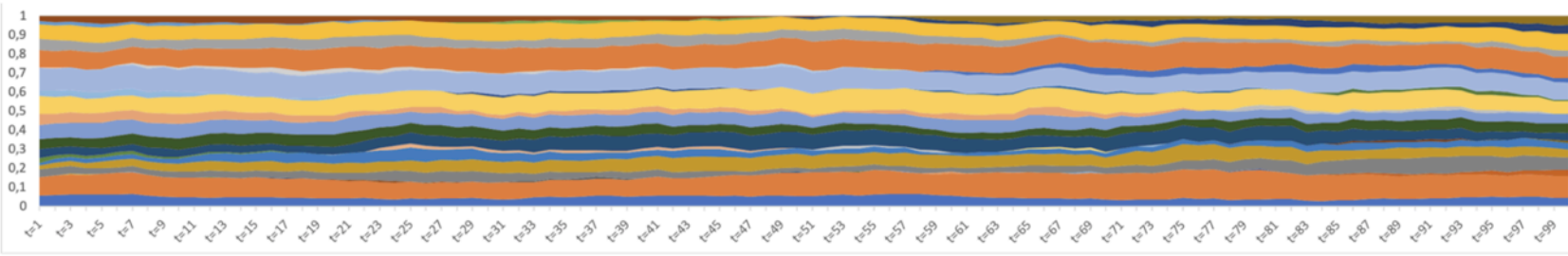
$$\pi_t^i = \frac{\hat{\pi}_t^i}{\sum_j \hat{\pi}_t^j}$$

After increment, the popularity (π) of each issues (i) is divided by the sum of all popularities so that they sum is always 1

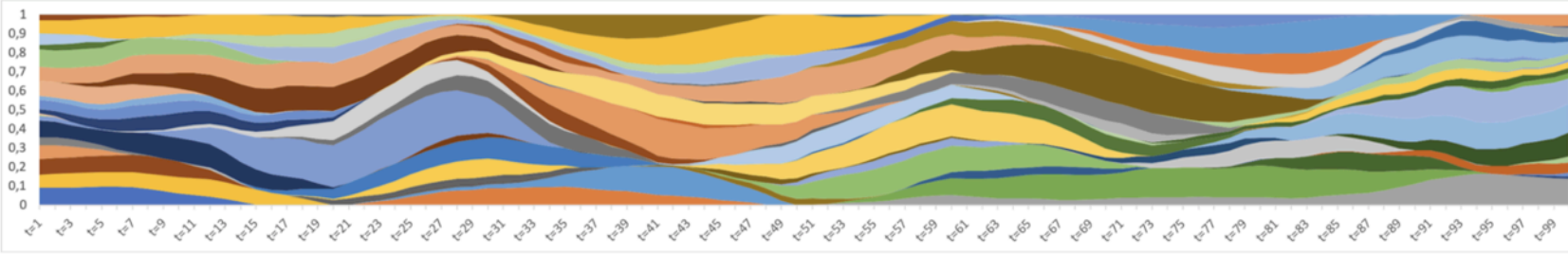
3. Inelasticity of total attention

A junk news bubble toy-model

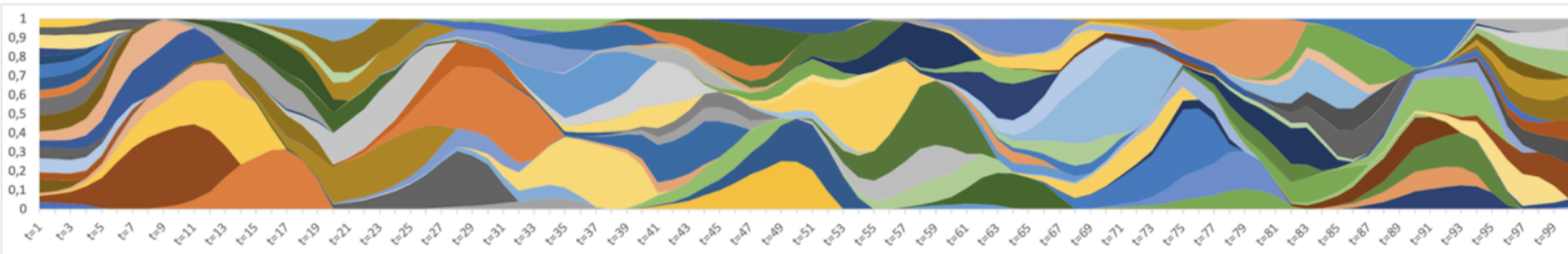
$\alpha = 0$



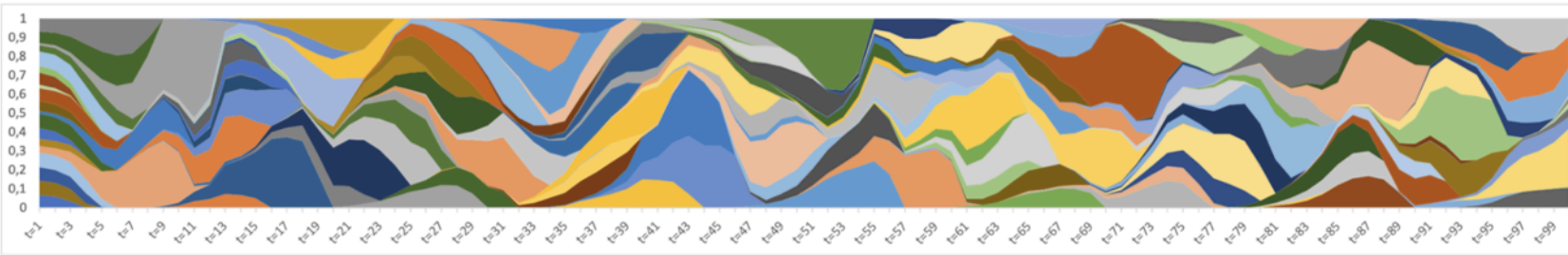
$\alpha = 1$



$\alpha = 2$

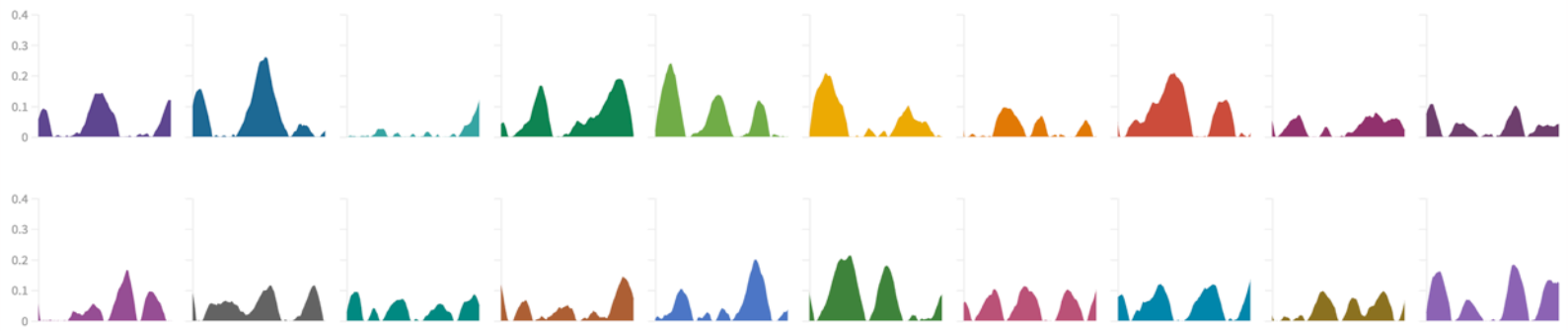


$\alpha = 3$

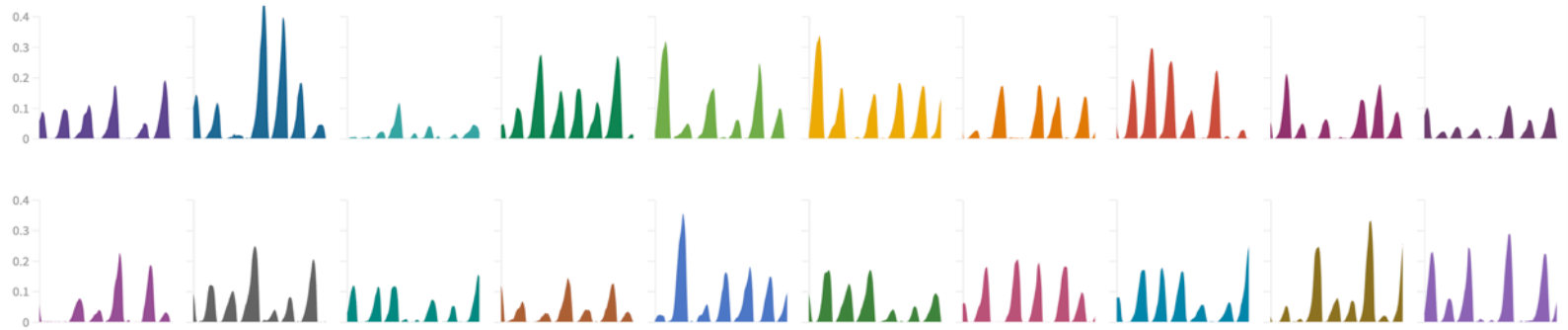


The consequences of trendiness

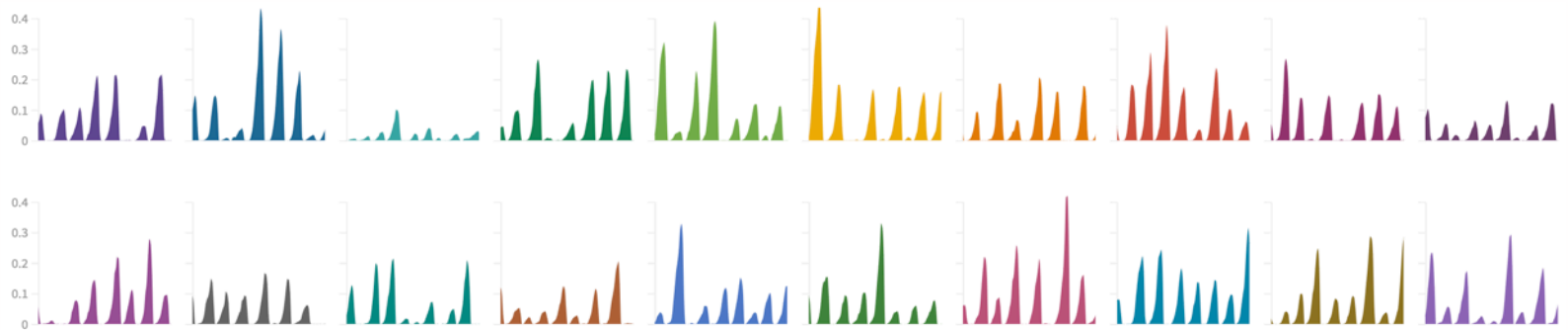
$\alpha = 1$



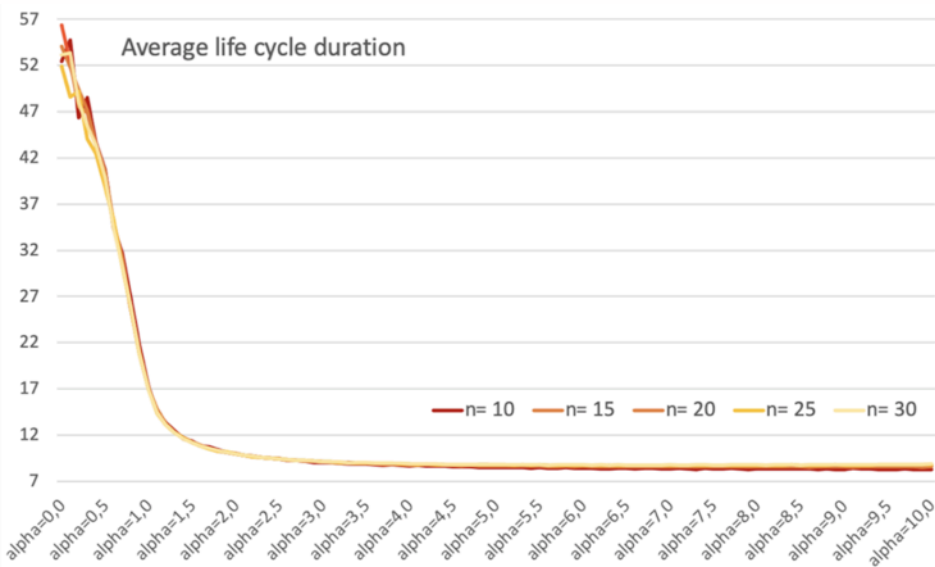
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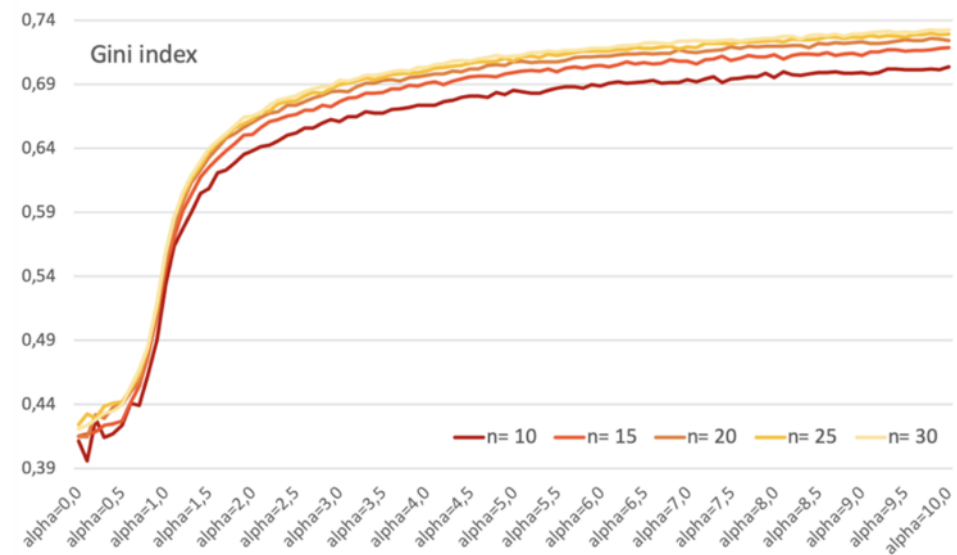
$\alpha = 3$



The consequences of trendiness

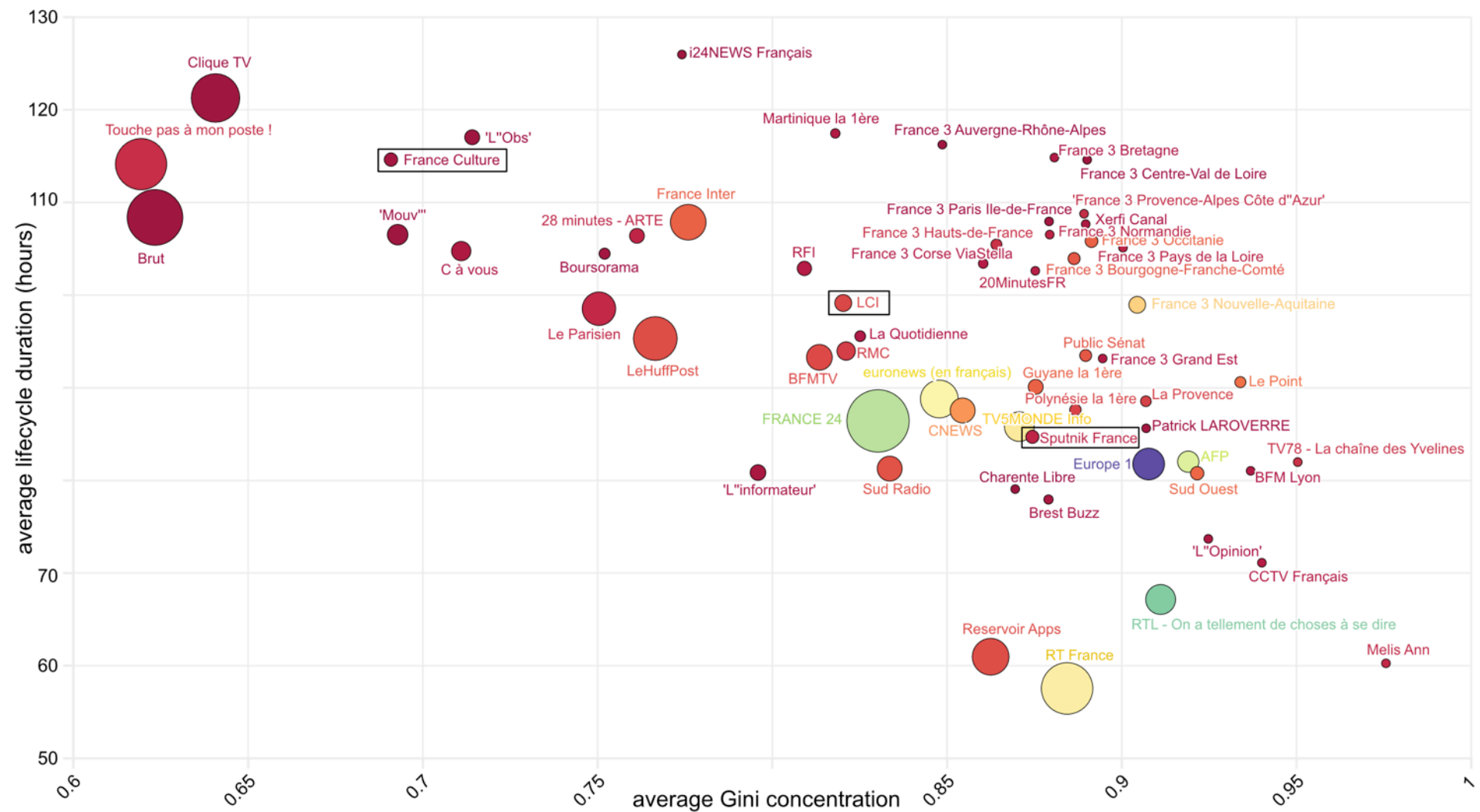


more ephemerality

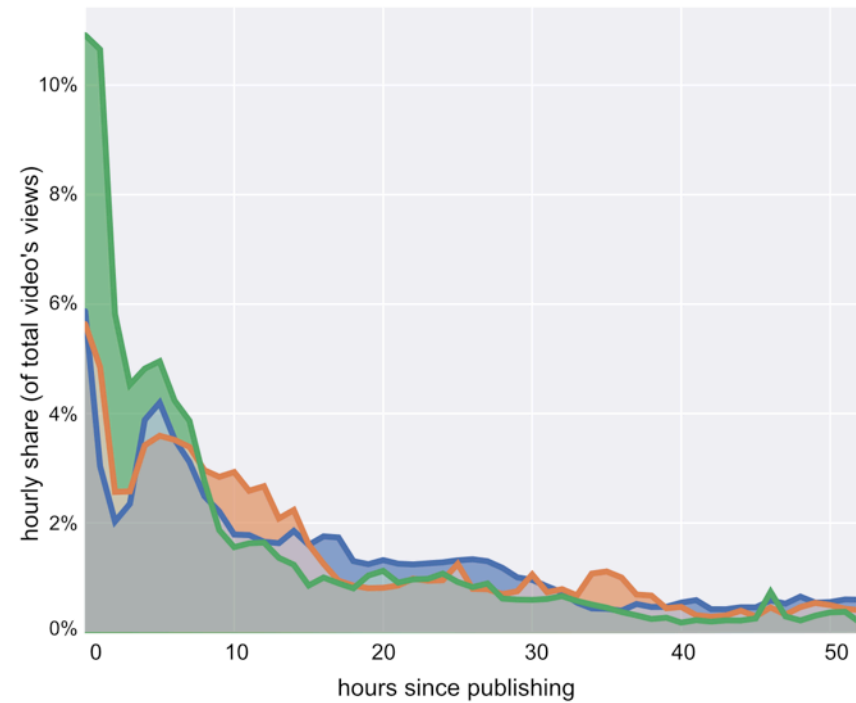
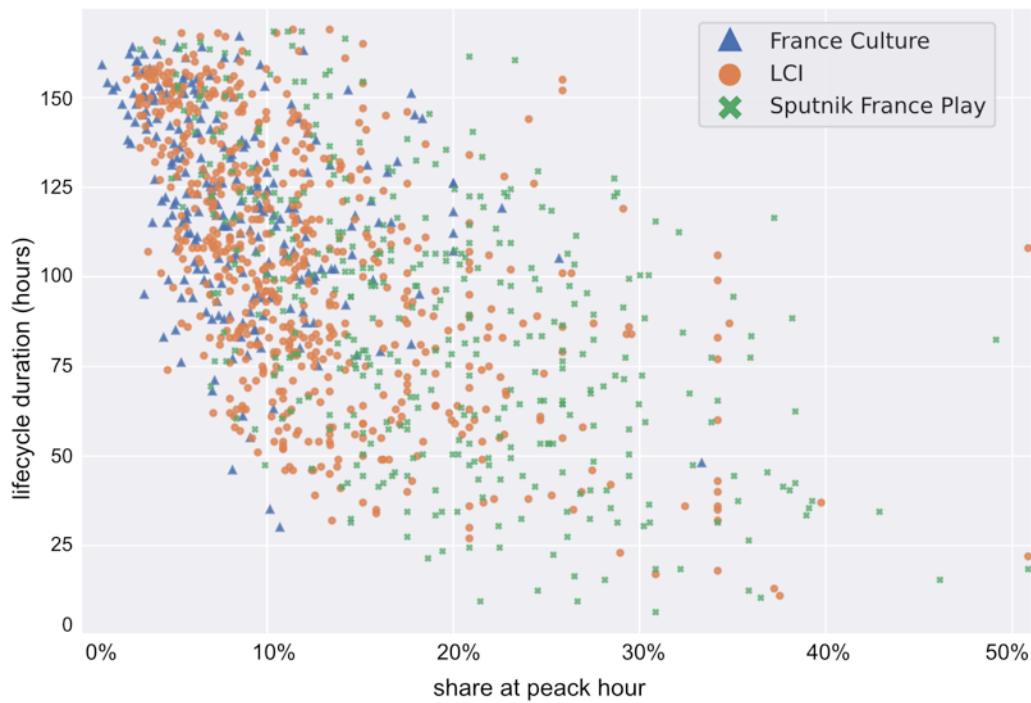


more concentration

The consequences of trendiness



Some empirical examples



Some empirical examples

Thank you!

- + Castaldo, Maria, Tommaso Venturini, Paolo Frasca, and Floriana Gargiulo. 2020. "Junk News Bubbles: Modelling the Rise and Fall of Attention in Online Arenas." *New Media & Society* (forthcoming).
- + Bounegru, Liliana, Jonathan Gray, Tommaso Venturini, and Michele Mauri. 2018. *A Field Guide to Fake News and Other Information Disorders*. Amsterdam: Public Data Lab.
- + Venturini, Tommaso. 2019. "From Fake to Junk News, the Data Politics of Online Virality." In *Data Politics: Worlds, Subjects, Rights*, edited by D. Bigo, E. Isin, and E. Ruppert, Forthcoming. London: Routledge.
- + Venturini, T. (2018). *Sur l'étude des sujets populaires ou les confessions d'un spécialiste des fausses nouvelles*. In P. Trudel (Ed.), *Les fausses nouvelles*. Presses de l'Université Laval. Gray,
- + Jonathan, Liliana Bounegru, and Tommaso Venturini. 2018. "The Infrastructural Uncanny: 'Fake News' and the Fabric of the Web as Matter of Concern." *New Media & Society*, forthcoming.

