Trust in my Fake News, Scepticism about yours: Experimental Evidence on how Ideological Congruence and Echo Chambers alter Beliefs in Fake News

Francisco Villarroel (UDD/USACH, Chile)
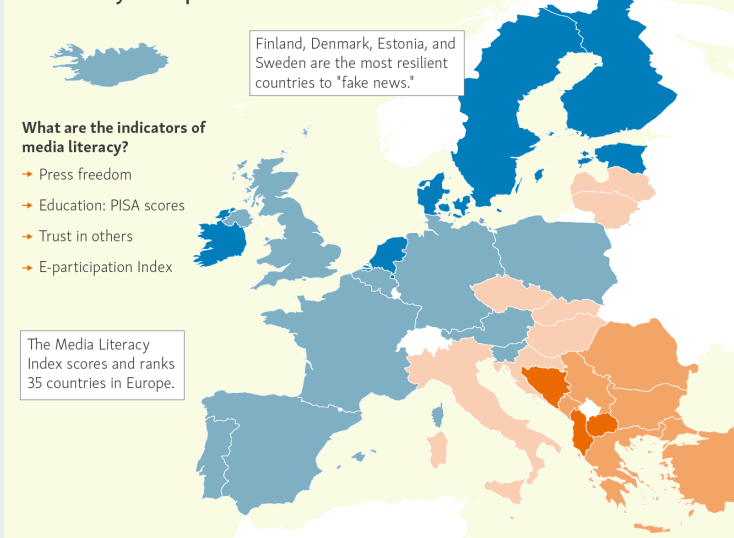
Denise Laroze (USACH, Chile)

UNIVERSIDAD
DE SANTIAGO
DE CHILE

Fighting 'Fake News' In Europe

Albania, Bosnia-Herzegovina, and North Macedonia are the least resilient countries to "fake news," a report by the Open Society Institute reveals.

RFE/RL Graphics

Media literacy in Europe:

Finland, Denmark, Estonia, and Sweden are the most resilient countries to "fake news."

What are the indicators of media literacy?

→ Press freedom
→ Education: PISA scores
→ Trust in others
→ E-participation Index

The Media Literacy Index scores and ranks 35 countries in Europe.

Media Literacy Index (rank) **and scores :**

rank	country	score	rank	country	score	rank	country	score
1	Finland	78	13	Luxembourg	59	25	Hungary	42
2	Denmark	73	14	Slovenia	58	26	Cyprus	42
3	Estonia	72	15	France	57	27	Greece	38
4	Sweden	72	16	Spain	56	28	Romania	34
5	Ireland	70	17	Poland	56	29	Serbia	32
6	Netherlands	68	18	Lithuania	53	30	Bulgaria	29
7	Belgium	64	19	Czech Republic	53	31	Turkey	28
8	Germany	62	20	Latvia	52	32	Montenegro	26
9	Iceland	62	21	Italy	49	33	Albania	22
10	United Kingdom	62	22	Slovakia	45	34	Bosnia-Herzegovina	19
11	Portugal	61	23	Malta	43	35	North Macedonia	15
12	Austria	60	24	Croatia	43			

RadioFreeEurope RadioLiberty

Nemeth Dora | Source: Open Society Institute Sofia: Media Literacy Index 2021

Growing evidence suggests the existence of fake news is problematic (Sunstein, 2014; Lazer et.al, 2018), polarizing (Spohr, 2019; Osmundsen et. al., 2021) and erodes democracy (Lance & Livingston, 2018). Partisanship increase from this years and Eco chambers participants and digital activist promotes it.

Are echo chambers and group polarization causing problems in processing information to participate in discussion in the public space?

This leads us to analyze how people and their partisanship interpret the information circulating in social media.

First theories conducting this research

Wiley Online Library   Search

Political Psychology   ISPP

ARTICLE

The Social Structure of Political Echo Chambers: Variation in Ideological Homophily in Online Networks

Andrei Boutyline ✉ Robb Willer

First published: 05 May 2016 | https://doi.org/10.1111/pops.12337 | Citations: 173

SpringerLink

Analyzing Social Media Data and Web Networks pp 25–46 | Cite as

Political Homophily on the Web

Robert Ackland & Jamsheed Shorish

Chapter

563 Accesses | 5 Citations

Abstract

- More political homophilia, more reinforcement in the group's opinions.

- in Homophilic networks: "At the same time, political homophily may also insulate individuals from exposure to false or offensive information" (2)

- Homophily makes you "lose perspective" of politically opposing information.

But ...

But fake news evidence said the opposite (although ambiguously)

- First research we visited was that it was more cognitive laziness than ideological biases.

- Using a simple but robust method, they measure the level of belief in fake news by modulating the response times and self-reflection capacity of the classification.

- Other studies have shown other attributes such as not believing in science as relevant factors for believing in fake news.

ELSEVIER

Contents lists available at ScienceDirect

Cognition

journal homepage: www.elsevier.com/locate/cognit

COGNITION

Original Articles

Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning

Gordon Pennycook[a,*], David G. Rand[a,b,c]

[a] Department of Psychology, Yale University, 1 Prospect Street, New Haven, CT 06511, USA
[b] Department of Economics, Yale University, 1 Prospect Street, New Haven, CT 06511, USA
[c] School of Management, Yale University, 1 Prospect Street, New Haven, CT 06511, USA

Trends in Cognitive Sciences

CellPress

Volume 25, Issue 5, May 2021, Pages 388-402

Review

The Psychology of Fake News

Gordon Pennycook [1, 2] ✉, David G. Rand [3, 4, 5] ✉

Show more ⌄

+ Add to Mendeley   ⌁ Share   � Cite

https://doi.org/10.1016/j.tics.2021.02.007   Get rights and content

Under a Creative Commons license   ● Open access

So...

Using the methodologies to the second group we try to test the first group hypothesis

Main Question

How partisanship affects when we have to distinguishing fake news from real news?

How does membership in echo chambers and digital citizenship affect this phenomenon?

Concept of Echo chambers and Digital Citizenship

- Friendship and resource network made up of like-minded people. Includes political homophily, social identity and confirmation bias (Boutyline et.al, 2017; Wollebæk et. al, 2019). Often produces by algorythms (Pariser, 2011)

- Type of political participation in digital platforms. includes technological skills, valuation of collective action in digital media and participation in them (Choi, M, 2016; Choi et.al, 2018; Chadwick, 2013; Castells, 2009).

¿What do we know about the relationship between echo chambers and misinformation?

- **Information bias**: Endemic consumption of information that is politically similar to one's own thinking and the distancing, rejection or impossibility of consuming information of different political thinking. (Currarini & Mengel, 2016; Halbestam & Knight, 2016)

- **Spread of Misinformation**: Those who belong to echo chambers spread information faster, generate rumors and reach audiences that do not directly access those rumors (Choi et. al. 2020)

Hypothesis, we expect:

Following the political homophily effects (Wollebaek et.al, 2019; Boutyline & Willer, 2017; Ackland & Shorish, 2014)

1) respondents will be less likely to accurately categorize fake and real news when asked to review news headlines with taking points associated with parties that oppose their political self-placement.

According to the same literature:

1.a) no differences in accuracy across respondents with high and low levels of echo chamber membership

Based on civic engament in social media literature (Gil de Zuñiga et.al, 2011, 2012; Castells, 2001,2009)

1.b) respondents with higher levels of digital citizenship will be more likely to accurately categorize fake and real news than citizen with low levels of digital citizenship

Methods

Sample

Online Survey Experiment (n= 690) with CESS Santiago de Chile's poll.

Randomization

Block randomization with Eco Chamber membership and levels of digital citizenship (both binaries)

Experimental survey

Socio-demographic characterization: Age range, gender, income, educational level, political ideology ("Left wing", "Right wing", "Center", "without ideology") + Fake news experiment

Analysis

Differences between averages by treatment, *Kruskall-Walis* and *Wilcoxon test*. And Regression models (balanced and unbalanced) with *Maximun Likehood* estimation

Experimental task

- Every participant received 7 headlines and we ask to evaluate if they're true or false

  > *We will show you below 7 different headlines that are circulating in Social Media, some of which are true and others false. You will have to indicate if they are true or false.*
  >
  > *(At the end of this survey you will be shown your results).*
  >
  > *How do you classify them?*

- if they're correct, them scoring 1. if there's incorrect, them scores zero.

- Maximun score is 7 and minimum is zero.

Validation process

- Two pre-test to evaluate the headline's relevance and difficulty

Eco Chamber membership Scale

- Using a recent validated scale[*] about reinforcement opinion in social media

- 7 items with 1 to 10 range por each item (total Range: 7 to 70)

- Low Eco Chamber Membership: 7 to 39

- High Eco Chamber Membership: 40 to 70

[*] Kaakinen, M., Sirola, A., Savolainen, I., & Oksanen, A. (2020). Shared identity and shared information in social media: Development and validation of the identity bubble reinforcement scale. Media Psychology, 23(1).

Digital Citizenship scale

- Using a Scale development by Choi[*] and reduced since 34 items to 14.

- Each item are with a 7 point scale (1 to 7). Total range: 14 to 98

- Low levels of digital citizenship: 14 to 62

- High levels of Digital citizenship: 63 to 98

[*] Choi, M., Glassman, M., & Cristol, D. (2017). What it means to be a citizen in the internet age: Development of a reliable and valid digital citizenship scale. Computers & Education, 107, 100-112.

Creating treatments

¿How to define treatments?

Using self political positions questions

T1 (Like-Minded)	T2 (Opposite)	T3 (Control)
The set of headlines in line with their ideology is delivered (left, right, center and without ideology)	If the person self-identifies as a leftist, he/she is given a set of right-wing headlines. If the person self-identifies as right-wing, he/she is given the left-wing headline set If the person self-identifies as centrist or non-ideological, he/she is randomized to a mixture of the left and right sets.	Random selection of 7 headlines from each ideology (4 falses and 3 true)

Where do news headlines come from?

We selected news headlines that were disseminated through social media and checked by independent fact-checking agencies, such as fast Check and "decodificador".

Headlines examples

Set of news headlines related to ideologies

Left wing related	Right wing related	Center related	Without ideology related
"Comptroller's Office authorizes controls in domiciles without authorization of the dwellers, for sanitary purposes". (Real)	"Comptroller's Office authorizes controls in domiciles without authorization of the dwellers, for sanitary purposes". (Real)	"Comptroller's Office authorizes controls in domiciles without authorization of the dwellers, for sanitary purposes". (Real)	"Comptroller's Office authorizes controls in domiciles without authorization of the dwellers, for sanitary purposes". (Real)
"'Vamos Chilenos': Almost no senior citizens will receive the benefits of the campaign led by Don Francisco [famous TV personality]." (False)	"Massive changes of address were part of electoral fraud in the election of Jorge Sharp in Valparaíso municipal election, 2016." (False)	"New law project allowing euthanasia does not contemplate that the patient may repent." (False)	"'Vamos Chilenos': Almost no senior citizens will receive the benefits of the campaign led by Don Francisco [famous TV personality]." (False)
"The patent to test Covid-19 was filed in 2015." (False)	"The patent to test Covid-19 was filed in 2015." (False)	"The patent to test Covid-19 was filed in 2015." (False)	"The patent to test Covid-19 was filed in 2015." (False)
"Sebastián Piñera owns AFP Habitat [Private mortgages company]" (False)	"Today destroying a city bus is free and there is no penalty." (False)	"Sebastián Piñera owns AFP Habitat." (False)	"Sebastián Piñera owns AFP Habitat." (False)
"Constanza Hube: "There is no problem if a forestry company burning down a National Park, economic freedom is sacred above all else"" (False)	"INDH human rights observers arrested for carrying Molotov cocktails on 'the day of the young activist' ". (False)	It's official: the State of China now controls the monopoly of the electricity supply of 57% of Chileans". (Real)	"Congressmen who performed remote work spent more than $165 million in transportation." (Real)
"Women fall back more than ten years in their participation in the labor market." (Real)	"Former Navy Commander, Edmundo Gonzalez: "If they let us act, we will put an end to terrorism in 72 hours". (Real)	Pepe Mujica: "Chile would be one of the best countries to live in and a world economic power if its citizens would unite and remove the politicians who have robbed them for years". (False)	Pepe Mujica: "Chile would be one of the best countries to live in and a world economic power if its citizens would unite and remove the politicians who have robbed them for years". (False)
"Michelle Bachelet's government built ditches in Colchane". (Real)	"Military officer who led caravan of drug traffickers arrested". (Real)	"Former Navy Commander, Edmundo Gonzalez: "If they let us act, we will put an end to terrorism in 72 hours". (Real)	"Michelle Bachelet's government built ditches in Colchane". (Real)

Results

Accuracy scores of news headlines
General results
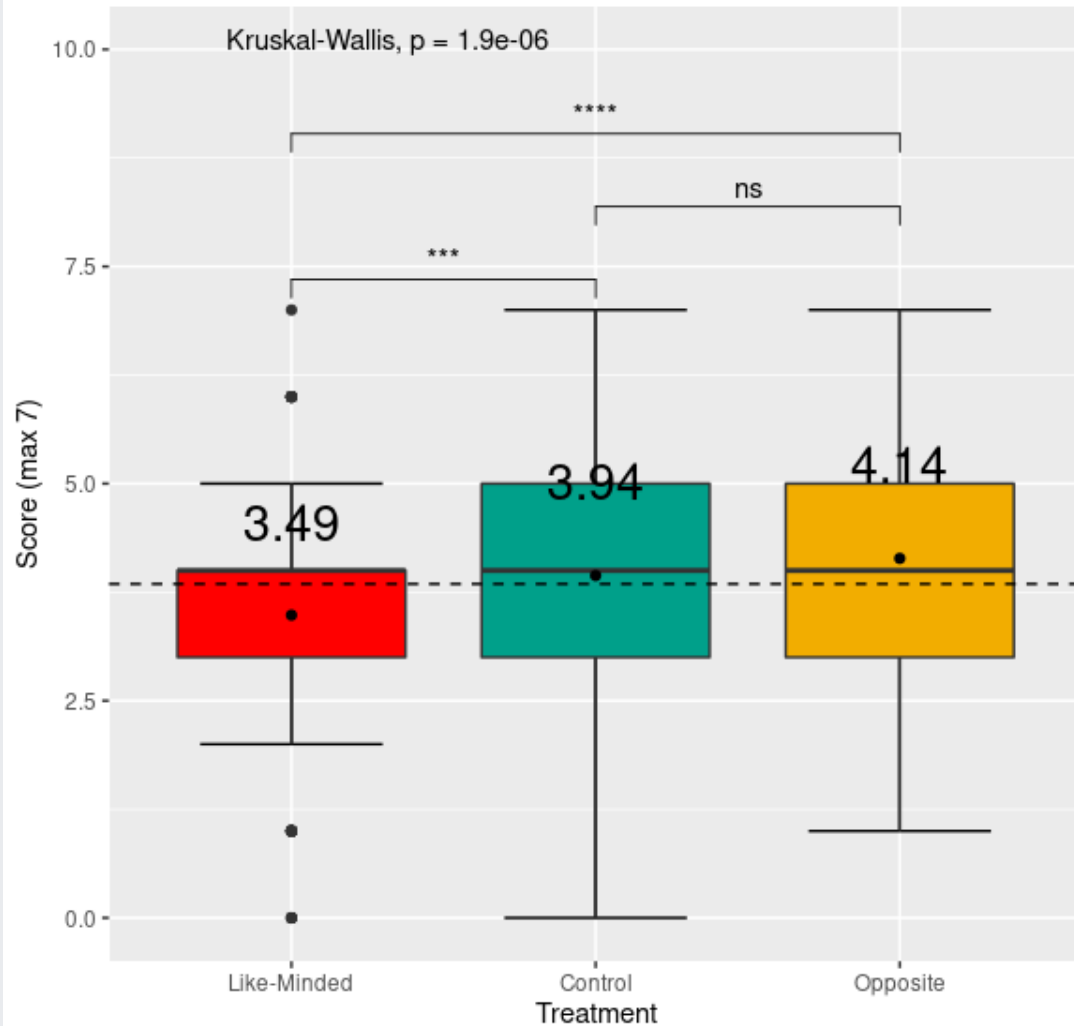
Tabla 1: Success score distinguishing fake news from real news

	Dependent variable:	
	Success score	
	normal	OLS
	(1)	(2)
Like-Minded	−0.456***	−0.456***
	(0.124)	(0.124)
Opposite	0.197	0.197
	(0.126)	(0.126)
Constant	3.942***	3.942***
	(0.089)	(0.089)
Observations	690	690
R^2		0.041
Adjusted R^2		0.038
Log Likelihood	−1,178.278	
Akaike Inf. Crit.	2,362.556	
Residual Std. Error		1.336 (df = 687)
F Statistic		14.790*** (df = 2; 687)
Significasnce levels	*p<0.05; **p<0.01; ***p<0.001	
	Base variables: Control Group	

By Echo Chamber membership
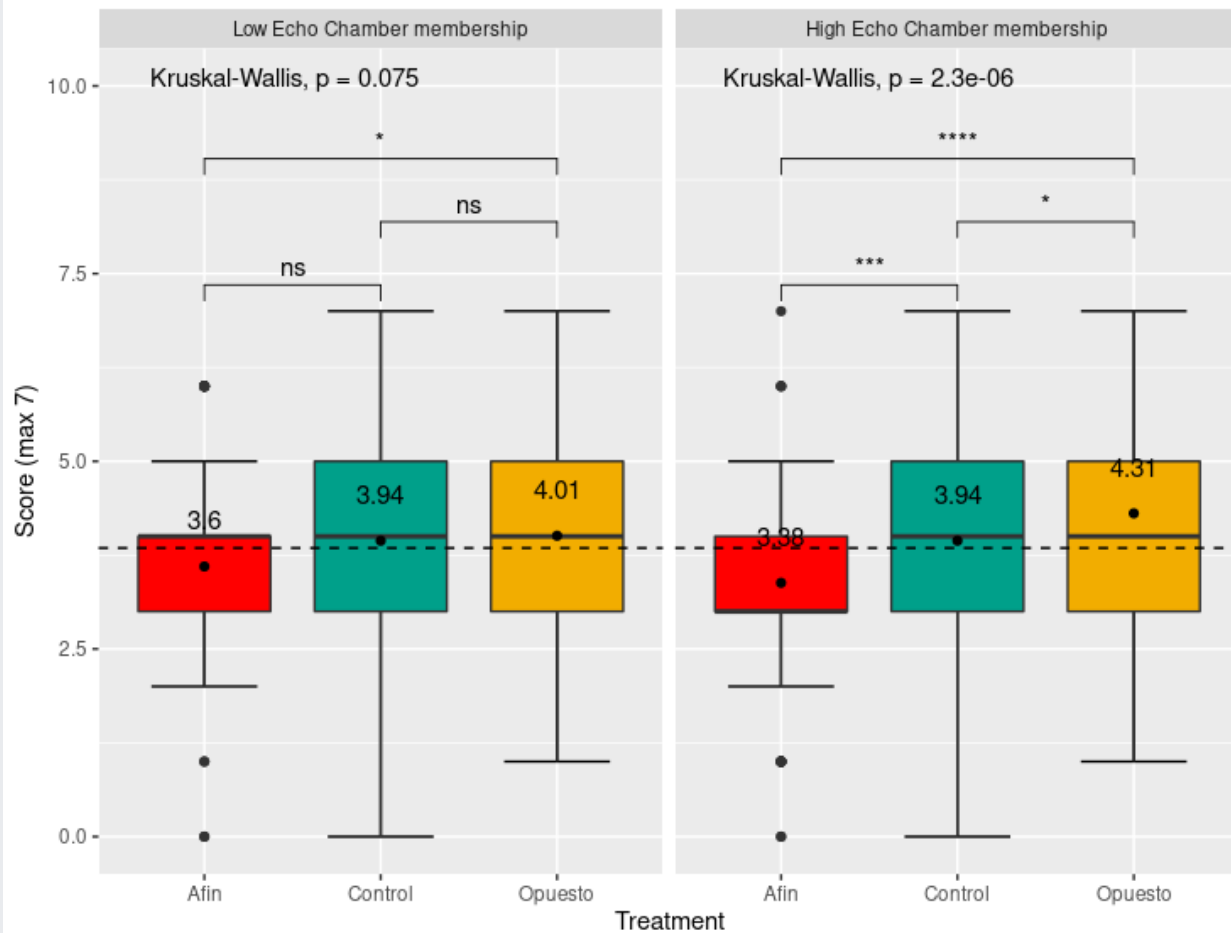
Tabla 2: Success score distinguishing fake news from real news

	Dependent variable:	
	Success score	
	normal	*OLS*
	(1)	(2)
Like-Minded	−0.456***	−0.456***
	(0.124)	(0.124)
Opposite	0.199	0.199
	(0.127)	(0.127)
High Eco Chamber	0.019	0.019
	(0.102)	(0.102)
Constant	3.932***	3.932***
	(0.105)	(0.105)
Observations	690	690
R^2		0.041
Adjusted R^2		0.037
Log Likelihood	−1,178.261	
Akaike Inf. Crit.	2,364.522	
Residual Std. Error		1.337 (df = 686)
F Statistic		9.857*** (df = 3; 686)
Significance levels		*p<0.05; **p<0.01; ***p<0.001

Base variables: Control Group, and Low Eco Chamber membership

By Digital Citizenship
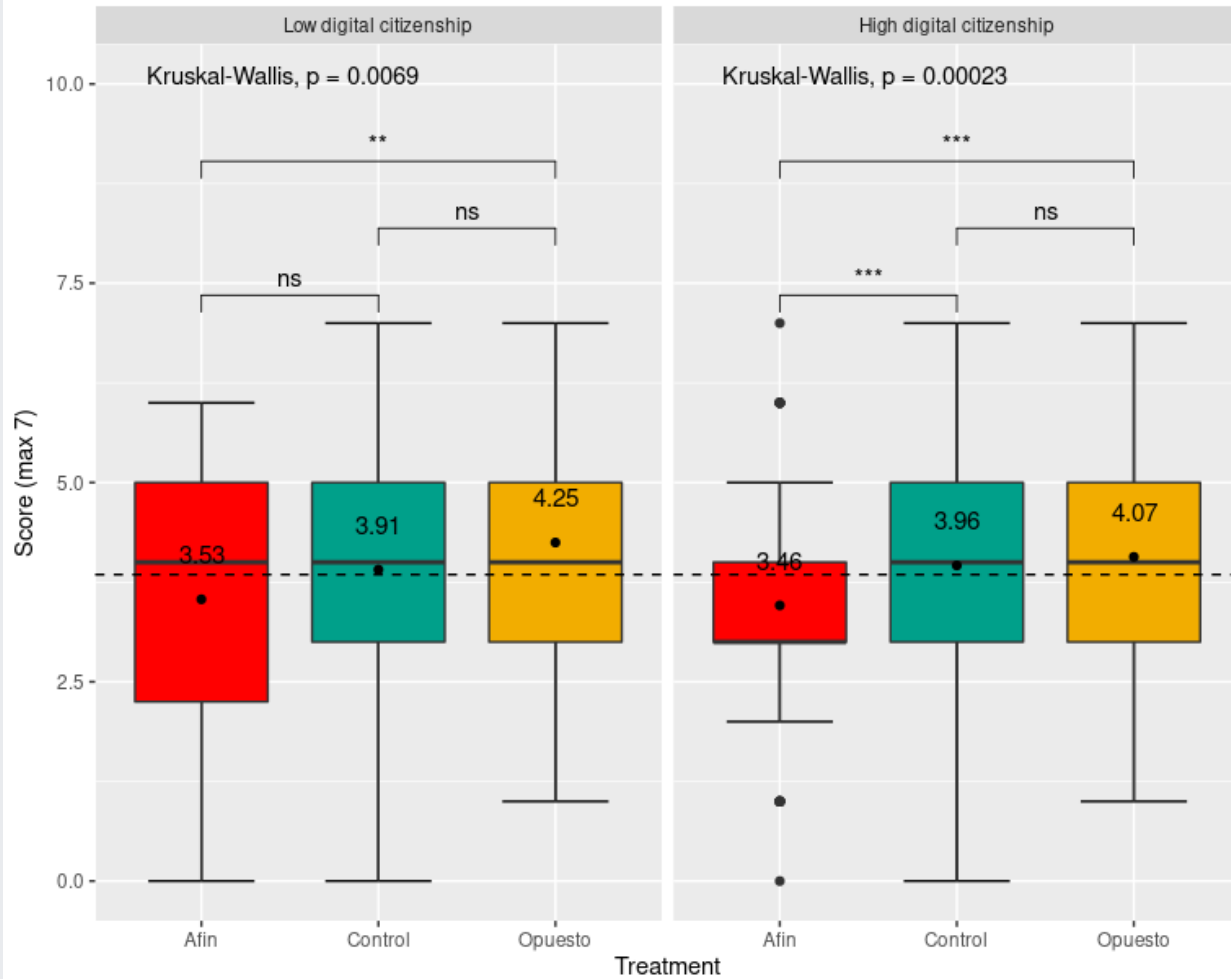
Tabla 3: Success score distinguishing fake news from real news

	Dependent variable:	
	Success score	
	normal	*OLS*
	(1)	(2)
Like-Minded	−0.458***	−0.458***
	(0.124)	(0.124)
Opposite	0.193	0.193
	(0.127)	(0.127)
High Digital Citizenship	−0.071	−0.071
	(0.106)	(0.106)
Constant	3.989***	3.989***
	(0.114)	(0.114)
Observations	690	690
R^2		0.042
Adjusted R^2		0.038
Log Likelihood	−1,178.055	
Akaike Inf. Crit.	2,364.110	
Residual Std. Error		1.336 (df = 686)
F Statistic		10.000*** (df = 3; 686)
Significance levels		*p<0.05; **p<0.01; ***p<0.001
		Base variables: Control Group, and Low Digital Citizenship

Tabla 4: Success score distinguishing fake news from real news

	Dependent variable:	
	Success score	
	normal	OLS
	(1)	(2)
Like-Minded	−0.457***	−0.457***
	(0.124)	(0.124)
Opposite	0.196	0.196
	(0.127)	(0.127)
High Eco Chamber	0.045	0.045
	(0.108)	(0.108)
High Digital Citizenship	−0.085	−0.085
	(0.112)	(0.112)
Constant	3.975***	3.975***
	(0.119)	(0.119)
Observations	690	690
R^2		0.042
Adjusted R^2		0.037
Log Likelihood	−1,177.968	
Akaike Inf. Crit.	2,365.936	
Residual Std. Error		1.337 (df = 685)
F Statistic		7.534*** (df = 4; 685)
Significance levels		*p<0.05; **p<0.01; ***p<0.001

Base variables: Control Group, Low Eco Chamber and Low Digital Citizenship

CATE by Echo Chamber membership
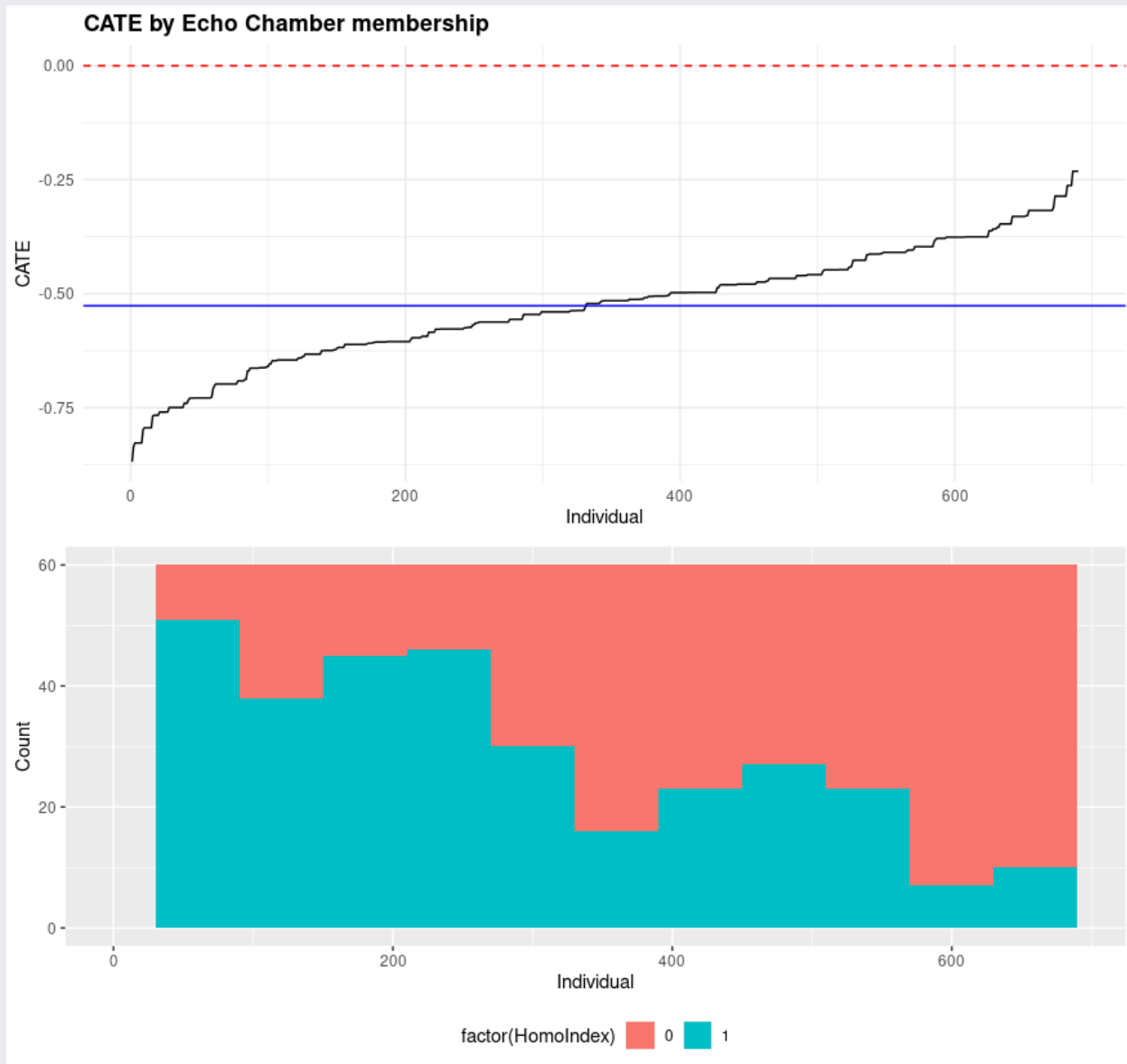
Discussion

- We find Evidence to intra-group biased new's consumption, supporting by others studies (eg: Osmundsen et.al, 2021; Pereira et.al, 2021)

- ***Motivated skepticism*** (Taber & Lodge, 2006). Motivated skepticism is a concept used to describe the process by which people pay more attention to and are better informed about content that is opposed to their thinking, so as to be able to debate more fiercely with them.

- Researchers who had not considered this concept come to the same finding (eg. Allen et.al, 2021; Pennycook & Rand, 2019), and so do we.

- This invites us to look at political polarization from another angle: Is it a question of misunderstanding the other, or overestimating our own position?

¡Thank You!

Francisco Villarroel
(fvillarroelr@udd.cl)

Denise Laroze
(denise.laroze@usach.cl)

This slide has created with **xaringan** and **XaringanThemer**

Appendix

Success score distinguishing fake news from real news

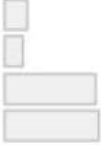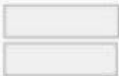|	Dependent variable:		
	Success score		
	(1)	(2)	(3)
T1 Like-minded	-0.456***	-0.456***	-0.457***
	(0.124)	(0.124)	(0.124)
T2 Opposite	0.197	0.199	0.196
	(0.126)	(0.127)	(0.127)
High Eco Chamber		0.019	0.045
		(0.102)	(0.108)
High Digital citizenship			-0.085
			(0.112)
Constant	3.942***	3.932***	3.975***
	(0.089)	(0.105)	(0.119)
Observations	690	690	690
Log Likelihood	-1,178.278	-1,178.261	-1,177.968
Akaike Inf. Crit.	2,362.556	2,364.522	2,365.936
Significance levels	*p<0.05; **p<0.01; ***p<0.001		
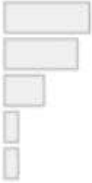
Some Insights about non-balances regression

- There a critical pint in the age-range. Younger people scores better. people to 45years+ tend to decrease the scoring.

- People with more education scoring better.

- There's no evidence of variations in political ideology and educational levels

References:

- Allen, J. N. L., Martel, C., & Rand, D. G. (2021). Birds of a feather don't fact-check each other: Partisanship and the evaluation of news in Twitter's Birdwatch crowdsourced fact-checking program [Preprint].

- Bago, B., Rand, D. G., & Pennycook, G. (2020). Fake news, fast and slow: Deliberation reduces belief in false (but not true) news headlines. Journal of Experimental Psychology: General, 149(8), 1608-1613.

- Castells, M. (2009). Comunicación y poder. Alianza, Madrid.

- Choi, D., Chun, S., Oh, H., Han, J., & Kwon, T. "Taekyoung". (2020). Rumor Propagation is Amplified by Echo Chambers in Social Media. Scientific Reports, 10(1), 310.

- Choi, M. (2016). A Concept Analysis of Digital Citizenship for Democratic Citizenship Education in the Internet Age. Theory & Research in Social Education, 44(4), 565-607.

- Choi, M., Cristol, D., & Gimbert, B. (2018). Teachers as digital citizens: The influence of individual backgrounds, internet use and psychological characteristics on teachers' levels of digital citizenship. Computers & Education, 121, 143-161.

- Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political Beliefs. American Journal of Political Science, 50(3), 755-769.

- Wollebæk, D., Karlsen, R., Steen-Johnsen, K., & Enjolras, B. (2019). Anger, Fear, and Echo Chambers: The Emotional Basis for Online Behavior. Social Media + Society, 5(2).

No	Variable	Stats / Values	Freqs (% of Valid)	Graph	Valid	Missing
1	AgeRecod [character]	1. +66 años 2. 18 a 29 años 3. 30 a 40 años 4. 41 a 65 años	129 (18.6%) 187 (26.9%) 190 (27.4%) 188 (27.1%)		694 (100.0%)	0 (0.0%)
2	EducRec [character]	1. Básica 2. Media 3. Postgrado 4. Sin Estudios 5. Superior	3 (0.4%) 174 (25.1%) 97 (14.0%) 3 (0.4%) 417 (60.1%)		694 (100.0%)	0 (0.0%)
3	IncomeRecod [character]	1. Ente $448.001 y $1.000.00 2. Entre $1.000.001 - $3.000 3. Entre $224.001 - $448.000 4. Más de $3.000.000 5. Menos de $224.000	262 (37.8%) 224 (32.3%) 122 (17.6%) 41 (5.9%) 45 (6.5%)		694 (100.0%)	0 (0.0%)
4	GenRecod [character]	1. Femenino 2. Masculino 3. Otro	388 (55.9%) 298 (42.9%) 8 (1.2%)		694 (100.0%)	0 (0.0%)
5	Ideología [character]	1. centro 2. Derecha 3. Izquierda 4. Ninguno	69 (9.9%) 55 (7.9%) 279 (40.2%) 291 (41.9%)		694 (100.0%)	0 (0.0%)
6	HomoIndex [numeric]	Min : 0 Mean : 0.5 Max : 1	0 : 348 (50.1%) 1 : 346 (49.9%)		694 (100.0%)	0 (0.0%)
7	DigitIndex [numeric]	Min : 0 Mean : 0.6 Max : 1	0 : 251 (36.2%) 1 : 443 (63.8%)		694 (100.0%)	0 (0.0%)