

# Belief in fake news. Echo chambers and digital citizenship Effects identifying fake news

Evidence from Chile

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Several social and political process in Chile and Social media are central. However, fake news impact to people who participate in eco Chambers and different digital activist

## **Main Question**

**How does membership in echo chambers and digital citizenship affect our scores distinguishing fake news from real news?**

# 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 algorithms (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 disinformation:** those who belong to echo chambers spread information faster, generate rumors and reach audiences that do not directly exceed those rumors (Choi et. al. 2020)

# Hypothesis

**1) There will be less accuracy in rating fake and real news when it comes to rating political opposite's view news headlines over like-minded news headlines or control group.**

**1.a) Those who have a high level of echo chamber membership will not exhibit greater differences in the headline hit rate between like-minded and contrarian thinking, compared to the control group.**

**1.b) Those with higher levels of digital citizenship will have greater accuracy in rating false and true headlines in all conditions**

# Methods

## Sample

Survey Experiment (n= 690) 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

We showed to participants 7 different news headlines, and asked them to rate them as true or false. We have three experimental conditions

## Analysis

Differences between averages by treatment, Kruskal-Wallis and Wilcoxon test. And Regression models (balanced and unbalanced) with *Maximun Likelihood* estimation

### ¿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)	<p>If the person self-identifies as a leftist, he/she is given a set of right-wing headlines.</p> <p>If the person self-identifies as right-wing, he/she is given the left-wing headline set</p> <p>If the person self-identifies as centrist or non-ideological, he/she is randomized to a mixture of the left and right sets.</p>	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".

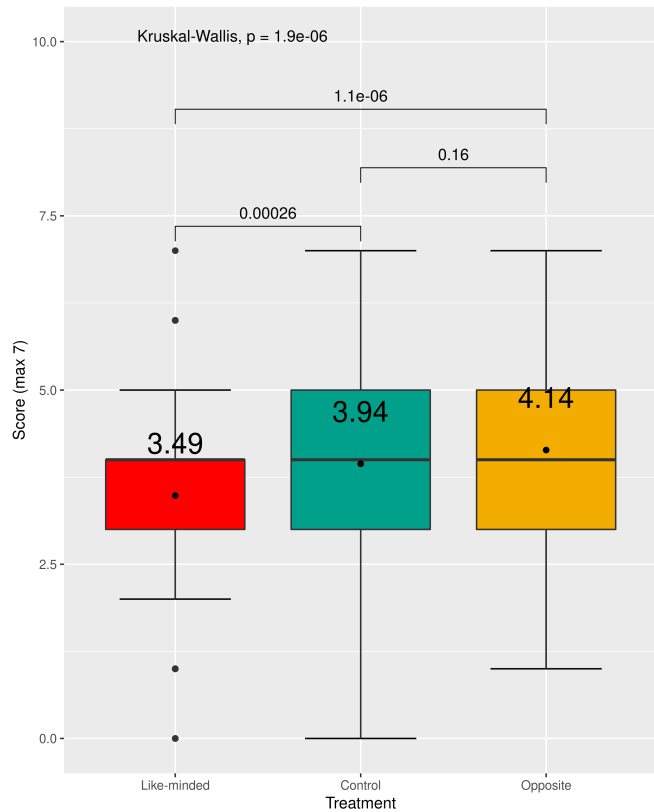


# Results



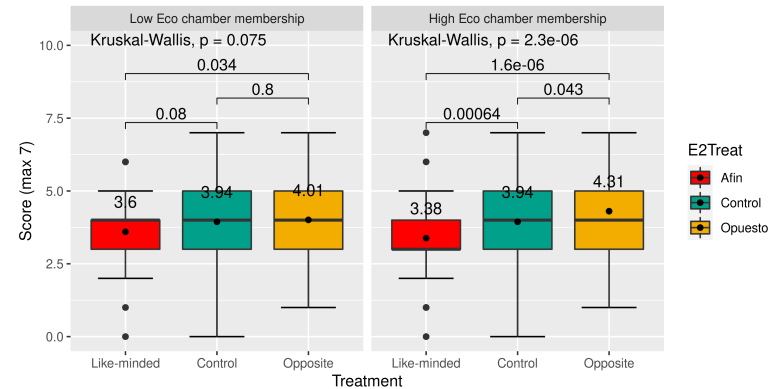
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## Experiment: Accuracy scores for true and false news headlines



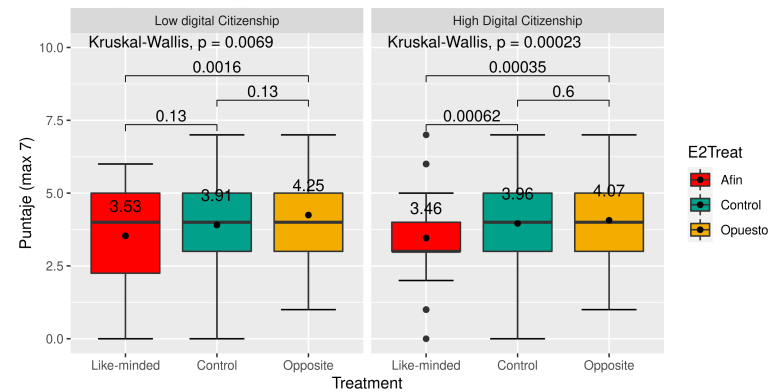
source: Own elaboration

## By Eco Chamber's membership



Source: Own elaboration

## By Digital Citizenship



Source: Own elaboration

**Success score distinguishing fake news from real news**

	<i>Dependent variable:</i>		
	Success score		
	(1)	(2)	(3)
T1 Like-minded	-0.456*** (0.124)	-0.456*** (0.124)	-0.457*** (0.124)
T2 Opposite	0.197 (0.126)	0.199 (0.127)	0.196 (0.127)
High Eco Chamber		0.019 (0.102)	0.045 (0.108)
High Digital citizenship			-0.085 (0.112)
Constant	3.942*** (0.089)	3.932*** (0.105)	3.975*** (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		

# 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 Exceptionism 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 is the first step to understand the trench warfare that has been taking place in Chile since the social mobilizations of October 2019. Biased information indicates limited deliberation and increased intolerance.
- This invites us to look at political polarization from another angle: Is it a question of misunderstanding the other, or overestimating our own position?

# iThank You!

This Slide has created with **xaringan**, **XaringanThemer** and **XaringanBuilder** packages.



# Appendix

## 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.
- 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.
- Currarini, S., & Mengel, F. (2016). Identity, homophily and in-group bias. *European Economic Review*, 90, 40-55.
- Fu, G., & Zhang, W. (2016). Opinion formation and bi-polarization with biased assimilation and homophily. *Physica A: Statistical Mechanics and Its Applications*, 444, 700-712.

- Halberstam, Y., & Knight, B. (2016). Homophily, group size, and the diffusion of political information in social networks: Evidence from Twitter. *Journal of Public Economics*, 143, 73-88.
- Osmundsen, M., Bor, A., Vahlstrup, P. B., Bechmann, A., & Petersen, M. B. (2021). Partisan Polarization Is the Primary Psychological Motivation behind Political Fake News Sharing on Twitter. *American Political Science Review*, 115(3), 999-1015.
- Pennycook, G., & Rand, D. G. (2019). Lazy, not biased: Susceptibility to partisan fake news is better explained by lack of reasoning than by motivated reasoning. *Cognition*, 188, 39-50.
- Pereira, A., Harris, E., & Van Bavel, J. J. (2021). Identity concerns drive belief: The impact of partisan identity on the belief and dissemination of true and false news. *Group Processes & Intergroup Relations*.
- Taber, C. S., & Lodge, M. (2006). Motivated Skepticism in the Evaluation of Political Beliefs. *American Journal of Political Science*, 50(3), 755-769.



# Set of headlines news by ideology

## 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)

Success score distinguishing fake news from real news. Non-balanced variables

	Dependent variable:							
	Success score							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
T1 Like-minded	-0.456*** (0.124)	-0.456*** (0.124)	-0.457*** (0.124)	-0.448*** (0.124)	-0.462*** (0.122)	-0.459*** (0.123)	-0.433*** (0.122)	-0.447*** (0.122)
T2 Opposite	0.197 (0.126)	0.199 (0.127)	0.196 (0.127)	0.213 (0.127)	0.193 (0.125)	0.202 (0.126)	0.207 (0.125)	0.178 (0.126)
High Eco Chamber		0.019 (0.102)	0.045 (0.108)	0.057 (0.108)	0.021 (0.106)	0.027 (0.107)	-0.038 (0.107)	-0.040 (0.107)
High Digital citizenship			-0.085 (0.112)	-0.080 (0.112)	-0.048 (0.110)	-0.042 (0.110)	-0.091 (0.110)	-0.101 (0.110)
Female				-0.175 (0.103)	-0.225* (0.102)	-0.224* (0.103)	-0.196 (0.102)	-0.141 (0.103)
30 to 40 years					-0.300* (0.136)	-0.332* (0.141)	-0.295* (0.140)	-0.320* (0.141)
41 to 65 years					-0.711*** (0.137)	-0.748*** (0.143)	-0.725*** (0.144)	-0.759*** (0.145)
66+ years					-0.390* (0.153)	-0.438** (0.160)	-0.494** (0.160)	-0.502** (0.160)
Elemental School						0.741 (1.079)	0.925 (1.070)	0.870 (1.067)
Secondary School						0.312 (0.774)	0.352 (0.767)	0.299 (0.765)
Graduate						0.380 (0.768)	0.354 (0.762)	0.259 (0.760)
Postgraduate						0.504 (0.776)	0.410 (0.770)	0.213 (0.770)
Left-wing							0.234 (0.176)	0.263 (0.175)
Right-wing							0.128 (0.239)	0.080 (0.239)
Without Ideology							-0.236 (0.177)	-0.194 (0.177)
224.001 - 448.000								0.226 (0.227)
448.001 - 1.000.000								0.209 (0.213)
1.000.001 - 3.000.000								0.443* (0.221)
3.000.000+								0.752* (0.291)
Constant	3.942*** (0.089)	3.932*** (0.105)	3.975*** (0.119)	4.054*** (0.128)	4.438*** (0.154)	4.074*** (0.784)	4.117*** (0.785)	3.892*** (0.805)
Observations	690	690	690	690	690	690	690	690
Log Likelihood	-1,178.278	-1,178.261	-1,177.968	-1,176.517	-1,162.891	-1,162.048	-1,153.530	-1,148.429
Akaike Inf. Crit.	2,362.556	2,364.522	2,365.936	2,365.033	2,343.782	2,350.096	2,339.061	2,336.857
Significance levels	*p<0.05; **p<0.01; ***p<0.001							