



Online information seeking dynamics

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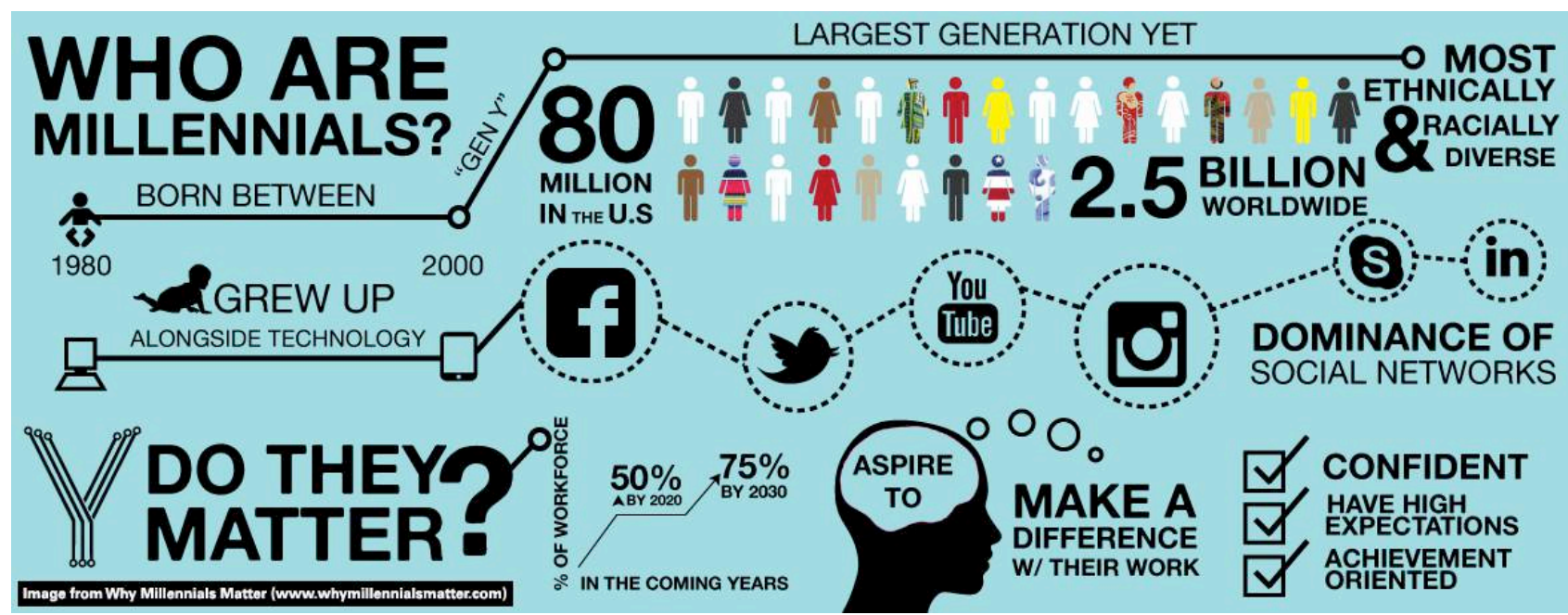


Lesson 26 Outline

- ***Information acquiring dynamics***
 - *Information seeking theories*
 - *Motivation and critical thinking*
 - *Confirmation bias and selective exposure*
 - *Filter bubble*

- ***Online social networks dynamics***
 - *Social media platforms*
 - *Echo chambers*
 - *Echo chambers and polarization*
 - *Polarization*
 - *Effects*
 - *Fake news*

Information seeking behavior is evolving with the development of new technologies, that allow us to access and be exposed to several sources. The new generation of digital natives, compared to the older ones, seems to have developed new strategies to filter information and news.



Information seeking

Core theories

Main components

The first structured theories on information seeking behavior date back to the 80s, and throughout the years they have evolved following the changing patterns from generation to generation. All of them put their focus on a specific component, related to information seeking and the principal ones are «need», «cognitive skills», «motivation» and «critical thinking»





Information seeking
Core theories: focus on «need»

Krikelas's Model (1983)

The model is divided in order to present the steps that constitute information seeking, namely:

1. Perceiving a need
2. Search
3. Finding the information
4. Using the information → satisfaction/dissatisfaction

According to Krikelas, the process starts when an individual feels the **need** to gather information in order to deal with an issue (Weiler, 2005)

Weiler, A. (2005). Information-seeking behavior in generation Y students: Motivation, critical thinking, and learning theory. *The Journal of Academic Librarianship*, 31(1), 46-53.



Information seeking

Core theories: focus on «cognitive development»

Kuhlthau's Model

The focus of this model is on the effectiveness of information seeking processes rather than on the process itself and is evidence-based. It was organized on the basis of a longitudinal study on high-school students.

It pinpoints its core on the individual's **cognitive skills**, which, according to the author, determine the effectiveness of the information seeking process, and contemplates a role of feelings in influencing the process (Weiler, 2005).

Weiler, A. (2005). Information-seeking behavior in generation Y students: Motivation, critical thinking, and learning theory. *The Journal of Academic Librarianship*, 31(1), 46-53.



Information seeking

Core theories: focus on «cognitive development»/»learning theories»

Eisenberg and Berkowitz's Model

Based on the “big six skills”, namely:

1. Task definition
2. Information seeking
3. Implementation
4. Use
5. Synthesis
6. Evaluation

Results more flexible as individuals can actually go back and redefine previous steps (Weiler, 2005)

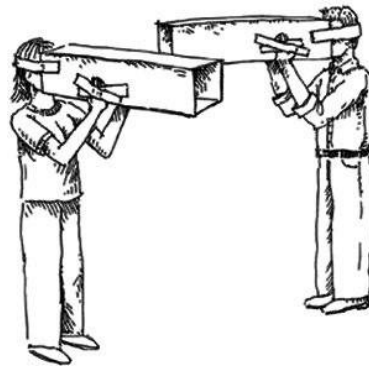
Weiler, A. (2005). Information-seeking behavior in generation Y students: Motivation, critical thinking, and learning theory. *The Journal of Academic Librarianship*, 31(1), 46-53.

Information seeking

Motivation and critical thinking

Motivation and critical thinking are two central elements in the study of information seeking behavior, which often result entwined.

- In particular, motivation appears to be crucial to develop and employ critical thinking, and the lack of either of the two factors can lead to **confirmation biases** (Weiler, 2005):
- People (who lack the two factors) who hold stronger opinions on a topic, result to be more prone to discuss it but mainly to state their position, rather than to gather more information
 - People tend to favor knowledge collected through personal experience
 - Having knowledge/opinion challenged creates discomfort and people act in order to avoid it



Weiler, A. (2005). Information-seeking behavior in generation Y students: Motivation, critical thinking, and learning theory. *The Journal of Academic Librarianship*, 31(1), 46-53.

Information seeking
Confirmation bias and selective exposure

The majority of the available studies on selective exposure and confirmation bias are born within the framework of the **Cognitive Dissonance Theory**



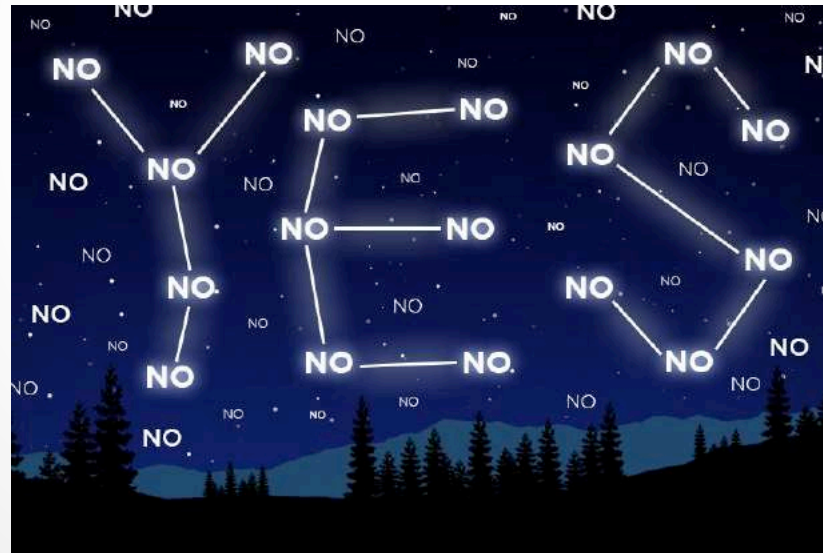
Festinger (1957). Refers to situations in which an individual presents conflicting beliefs and/or behavior. This state of dissonance, leads the individual to either modify the belief or the behavior to avoid internal conflict and reduce the discomfort

Festinger, L. (1957). *A Theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Information seeking

Confirmation bias and selective exposure

Once individuals have made a choice, they prefer consonant information in order to reinforce and justify their preferred option and avoid post-decisional conflict. For this reason, they tend to examine and accept only information confirming their point of view (Jonas et al., 2001)



Jonas, E., Schulz-Hardt, S., Frey, D., & Thelen, N. (2001). Confirmation bias in sequential information search after preliminary decisions: an expansion of dissonance theoretical research on selective exposure to information. *Journal of personality and social psychology*, 80(4), 557.

Information seeking

Filter bubble

These effects result enhanced in online settings, where the creation of **Filter Bubbles** is reinforced by algorithms



Filter Bubble: the potential for online personalization to effectively isolate people from a diversity of viewpoints or content (Pariser, 2012)

E. Pariser. The Filter Bubble: What the Internet is Hiding from You. Penguin, Mar. 2012. In Nguyen, T. T., Hui, P. M., Harper, F. M., Terveen, L., & Konstan, J. A. (2014, April). Exploring the filter bubble: the effect of using recommender systems on content diversity. In Proceedings of the 23rd international conference on World wide web (pp. 677-686). ACM.



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Filter bubble

In order to facilitate the decision making process by avoiding an excessive amount of choices, several platforms implement algorithms that build their users' profile and then recommend them goods and services on the basis or previous choices.

Example:

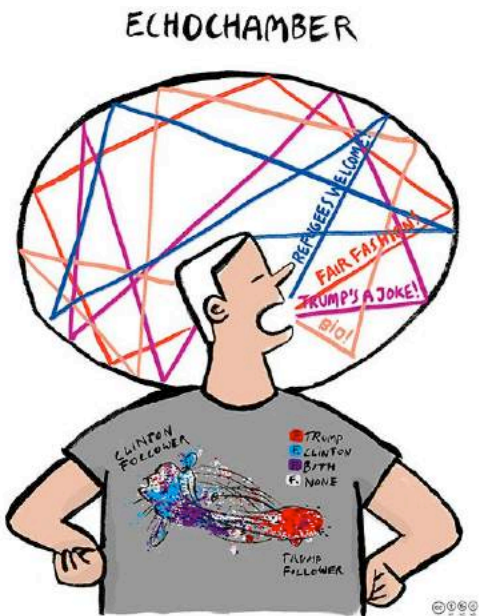
- 35% of Amazon's sales comes from their recommendation system (Marshall, 2013)
- 75% of what users watch on Netflix is based on the recommendation system (Amatriain & Basilico, 2013)

The effectiveness of these algorithms is however leading users to being exposed to an increasingly narrower selection of options and information.

Nguyen, T. T., Hui, P. M., Harper, F. M., Terveen, L., & Konstan, J. A. (2014, April). Exploring the filter bubble: the effect of using recommender systems on content diversity. In Proceedings of the 23rd international conference on World wide web (pp. 677-686). ACM.

Information seeking Social media platforms

The same mechanisms take place in social networks: on “public” platforms such as Twitter or Instagram, users are suggested pages and people to follow on the basis of previous actions, while on a more private platform as Facebook, the isolation can be even more enhanced as users tend to have in their friends list people they know or they share several things in common with.



Information seeking

Echo chambers

Echo Chamber: is a metaphorical term used to describe the effect that can occur in “closed” settings, in which only a particular set of opinions reverberates around, resulting in the setting being isolated from other points of view (Wallstein, 2005)



Wallsten, K. (2005, September). Political blogs and the bloggers who blog them: Is the political blogosphere and echo chamber. In American Political Science Association's Annual Meeting. Washington, DC September (pp. 1-4).

Information seeking

Echo chambers

Several studies have recently analyzed the echo chamber effect, whose existence (or rather, impact) is still argued:

- A first front of research presents evidence on how the effect is particularly strong for how current social media platforms are structured, in addition to the human tendency to do so also under other circumstances (Garrett, 2009), and has analyzed the effect in relation to recent “hot topics” such as the spread of fake news and the “surprise effect” in reaction to recent political outcomes such as the victory of Donald Trump at the 2016 US elections, and the victory of the “leave” option at the Brexit referendum (Jin et al., 2017)
- A second front supports the idea that nowadays users are nevertheless exposed to diverse sources, opinions and information (Kohut, Doherty, Dimock & Keeter, 2006), so these outcomes must be related to other variables rather than the so-called “echo chamber effect”

- Garrett, R. K. (2009). Echo chambers online?: Politically motivated selective exposure among Internet news users. *Journal of Computer-Mediated Communication*, 14(2), 265-285.
- Kohut, A. (2006). Maturing Internet New Audience—Broader than Deep. In Garrett, R. K. (2009). Echo chambers online?: Politically motivated selective exposure among Internet news users. *Journal of Computer-Mediated Communication*, 14(2), 265-285.
- Jin, Z., Cao, J., Guo, H., Zhang, Y., Wang, Y., & Luo, J. (2017). Rumor Detection on Twitter Pertaining to the 2016 US Presidential Election. arXiv preprint arXiv:1701.06250.

Information seeking

Echo chambers and polarization

Despite the two theoretical frameworks, strong evidence show how social media platforms, for how they are structured, tend to shield users from diverse opinions and points of view, possibly causing a **polarization** of thoughts and beliefs (Colleoni, Rozza & Arvidsson, 2014), which results in a lack of communication and exposure to diverging ideas.



Colleoni, E., Rozza, A., & Arvidsson, A. (2014). Echo chamber or public sphere? Predicting political orientation and measuring political homophily in Twitter using big data. *Journal of Communication*, 64(2), 317-332.

Information seeking

Polarization

Studies conducted on social media platforms show how the echo chamber effect, causing a higher **homophily** (shared view of the world) within contacts, can increase the polarization of beliefs by the sole exposure to like-minded people (Colleoni, Rozza & Arvidsson, 2014).

Homophily



People of similar characteristics tend to befriend each other

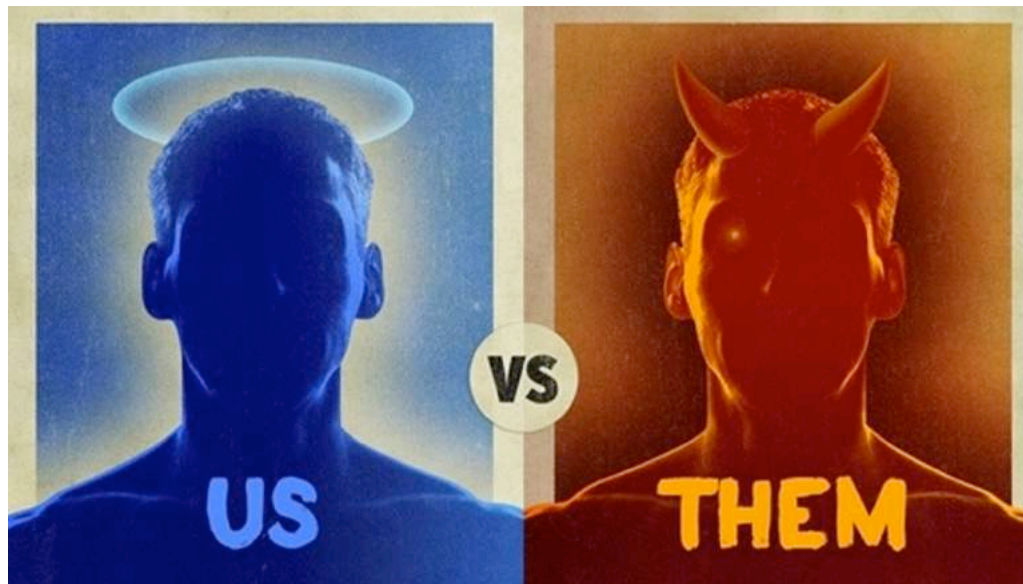


Colleoni, E., Rozza, A., & Arvidsson, A. (2014). Echo chamber or public sphere? Predicting political orientation and measuring political homophily in Twitter using big data. *Journal of Communication*, 64(2), 317-332.

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Polarization

Furthermore, it appears that even in more “open” social networks such as Twitter, being exposed to diverse opinions, instead of leading users to engage in meaningful debates, tends to reinforce already existing **in-group favoritism*** and **out-group derogation***, leading the users to polarize even further (Yardi & Boyd, 2010)



Yardi, S., & Boyd, D. (2010). Dynamic debates: An analysis of group polarization over time on twitter. *Bulletin of Science, Technology & Society*, 30(5), 316-327.



***In-group favoritism:** the tendency to respond more positively to people from our ingroups than we do to people from outgroups (Appiah, Knobloch-Westerwick & Alter, 2013)

***Out-group derogation:** making or seeking negative evaluations of groups of which one is not a member, or displaying a preference for messages that negatively characterize Outgroups (Jackson, Sullivan, Harnish, & Hodge, 1996)

- Jackson, L. A., Sullivan, L. A., Harnish, R., & Hodge, C. N. (1996). Achieving positive social identity: Social mobility, social creativity, and permeability of group boundaries. *Journal of Personality and Social Psychology*, 70(2), 241.
- Appiah, O., Knobloch-Westerwick, S., & Alter, S. (2013). Ingroup favoritism and outgroup derogation: Effects of news valence, character race, and recipient race on selective news reading. *Journal of Communication*, 63(3), 517-534.

Information seeking

Effects

After analyzing how and why individuals look for information, what happens within the process and all the biases and social implication of this phenomenon, it is possible to contextualize a highly heated topic in recent times:



Information seeking

Fake news

Fake news can be vehiculated by the media for several reasons:

- Timely coverage (impossibility to verify the sources in time) (Lewandowsky et al., 2012)
- Oversimplification of complex topics (such as presenting scientific topics to vast audiences) (Lewandowsky et al., 2012)
- Journalistic necessity to present a thesis and an antithesis in an article (i.e., for scientific topics it may happen that the thesis is supported by scientific evidence, while the antithesis is born within the framework of conspiracy theories) (Lewandowsky et al., 2012)
- Deliberate creation of fake news to gain economic benefits from advertising (Subramanian, 2017)

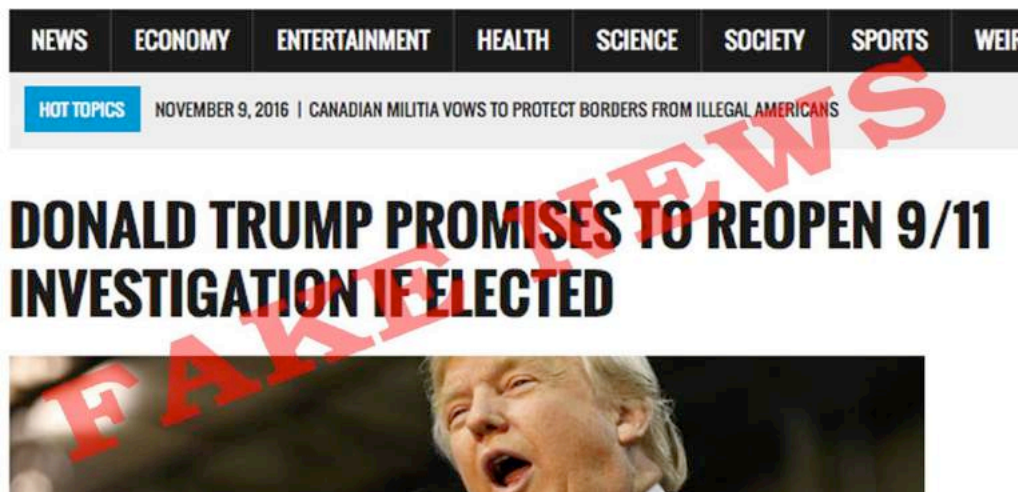
- Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and its correction continued influence and successful debiasing. *Psychological Science in the Public Interest*, 13(3), 106-131.
- Subramanian, S. (2017, February 15). The Macedonian Teens Who Mastered Fake News. Retrieved February 17, 2017, from <https://www.wired.com/2017/02/veles-macedonia-fake-news/>

Information seeking

Fake news

The latter type of fake news represents a quite recent phenomena, for example, it appears that during the recent US presidency elections, hundreds of fake news websites were created and articles containing fake content, aimed at Trump's supporters, circulated throughout the web.

These websites, posting shocking and catchy articles, gained money by placing advertisements and gaining from each visitor (Subramanian, 2017)



Subramanian, S. (2017, February 15). The Macedonian Teens Who Mastered Fake News. Retrieved February 17, 2017, from <https://www.wired.com/2017/02/veles-macedonia-fake-news/>



Information seeking

Fake news

Of course not all users believe in fake news, but if they do, recent studies suggest it could happen for several reasons:

- Lack of knowledge on the topic (Lewandowsky et al., 2012)
- Lack of critical thinking-related abilities (Wineburg, McGrew, Breakstone & Ortega, 2016)
- Confirmation bias (Del Vicario et al., 2016)
- The structure of social media platforms (Del Vicario et al., 2016)

- Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., ... & Quattrociocchi, W. (2016). The spreading of misinformation online. *Proceedings of the National Academy of Sciences*, 113(3), 554-559.
 - Lewandowsky, S., Ecker, U. K., Seifert, C. M., Schwarz, N., & Cook, J. (2012). Misinformation and its correction continued influence and successful debiasing. *Psychological Science in the Public Interest*, 13(3), 106-131.
 - Wineburg, S., McGrew, S., Breakstone, J., & Ortega, T. (2016). Evaluating Information: The Cornerstone of Civic Online Reasoning.



Information seeking

Fake news and future perspectives

After the strong impact that the circulation of fake news had on political and health-related issues, the discussion is focusing on how to limit them.

On one side start-ups and companies are developing tools that can detect the veracity and trustworthiness of news, on the other side, public institutions are working to implement programs to teach young children how to evaluate sources.

Despite the currently available research on information seeking behavior in online settings, several social factors have not been analyzed yet and their potential relation with fake news must be further investigated.

Thank you for the attention!

