The filter bubble – a constructivist approach

"Imagine a future in which your interface agent can read every newswire and newspaper and catch every TV and radio broadcast on the planet, and then construct a personalized summary. This kind of newspaper is printed in an edition of one."
(Negroponte, 1995, p. 153)

***Abstract**: The social media filter bubble has been a widely discussed issue in the aftermath of the most recent global political events. The following paper aims to explore this issue through the lenses of social constructivism. I will attempt to draw inspiration from the social construction of technology theory in order to explain the effects of the feed algorithms present in the design of social media platforms. In order to accomplish this, I will try to understand the interaction between the users and the platforms from a psychological viewpoint. The concepts of relational motives, epistemic motives and existential motives represent a relevant guide for explaining the needs and characteristics of the users that have lead to the development of elective affinities towards sources of information that are congruent with one's worldview. I will argue that this is a part of the social construction of the digital technological artifact represented by the feed algorithm and is reflected in the tendency that individuals display towards ideological thinking. Finally, the main thesis of this paper is that the design of the social media platforms, with the addition of the feed algorithms, is not the main explanation for the filter bubble issue, but the nature of the user and the needs that drives them towards forming ideological affiliations.*

***Keywords**: filter bubble, technological determinism, social construction of technology theory, elective affinities, ideology.*

Introduction

A couple of events that marked the year of 2016 – namely the results of the Brexit referendum in the United Kingdom and the victory of Donald Trump in the US Presidential Elections – brought into light a phenomenon that seems to directly affect the way in which citizens inform themselves and shape and conserve their political opinions: the *filter bubble*.

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The term was first coined in 2011 by the internet activist and co-founder of the Upworthy website Eli Pariser, and it is used to describe the way in which the content we are exposed to online is personalized, through extrapolations and algorithms, in accordance to our navigation history. Platforms such as Google and Facebook have made a goal out of offering each user as much of an individualized experience as the state-of-the-art code allowed (Pariser, 2011, p. 33) This goal embodies a dedication to both customer-service and precisely targeted sales, but, as Pariser notes, it can have a nega-

tive effect on the deliberation process, especially when, according to a 2016 study by Pew Research Center (Gottfried & Shearer, 2016, p.2), 62% of US citizens are reported to use social media as a main source of news : "Democracy requires citizens to see things from one another's point of view, but instead we're more and more enclosed in our own bubbles. Democracy requires a reliance on shared facts; instead we're being offered parallel but separate universes" (Pariser, 2011, p. 28).

The events I mentioned above have led the media and various pundits (e.g. Mostafa M. El-Bermawy, Nikki Usher Layser, Jacob Weisberg) and even former US President Barack Obama, to raise the alarm over the harmful side-effects of filtering algorithms. For example, Quattrociocchi et al. point out that the main changes brought by social media in the user's behavior are the tendency to select information that adheres to their own beliefs and to form groups with mainly like-minded people, which leads to a further polarization in their opinions. This polarization is twofold, as it is apparently also triggered, at times, by exposure to dissenting information. An emphasis is also put on the tendency of individuals to accept false news without passing the information through their critical filter (Quattrociocchi et al., 2016, p. 1).

While these effects are arguably already relevant and present in various political processes, it is not the purpose of this paper to discuss them. What I intend to argue is that this discussion reflects a narrative of *technological determinism*, which tends to understate the social conditions that led to the adoption of the feed algorithms that resulted in the filter bubble, ultimately viewing it as a *black box.* The alternative I propose is rooted in the *social construction of technology theory*, and seeks to explain the filter bubble not as a direct technological issue, but an issue related to the nature of the user.

Two paradigms concerning the relation between technology and society

Technological determinism and the social construction of technology are two opposing views that attempt to explain the interactions between technology and society. The two terms do not exhaust all the existing views on this matter: for example, none of the two can fully integrate the Marxist theory of productive forces, even if it presents elements related to technological determinism, or the even more intricate "technological imperative" covered by Heidegger and then Marcuse (Rogers, 2008, p. 41-47). However, they can prove to be useful guides for exploring public debates that tackle the social impact of certain technological artifacts.

What Winner identifies as common ground for the authors that subscribe to the doctrine on technological determinism (even when it is presented, in a softer language, as "the impact of technological innovation") is "the belief that alterations in technology have been and will probably continue to be the primary cause of change in our institutions, practices, and ideas" (Winner, 1978, p. 74-75). Technological determinism also has a stronger form, which is encountered more rarely at the discourse level and is based on two main hypotheses: "(1) that the technological base of a society is the fundamental condition affecting all patterns of social existence and (2) that changes in technology are the single most important source of change in society" (Winner, 1978, p. 76). Rogers also makes a distinction between a hard technological determinism, which embodies the idea that "society is the product of technological development and the trajectory of this development is governed by historical or natural law" (Rogers, 2008, p. 41), and a softer version, developed in turn by Heilbroner, that holds that there is "an

inner logic to technological innovation, but technological development is also direct by socioeconomic factors, which are strongly influenced by technology, without being completely determined by it, given the cultural and political considerations are also imposed on socio-economic factors" (Rogers apud Heilbrone, 1967, p. 335-345).

There are several critiques towards this paradigm, which tackle both the factors that cause certain technological innovations and the nature of innovation's effects.

In regards to the latter part, David Noble, a critical historian of technology, pin-pointed the place of technological developments in the complex web of social relations: "Technological developments are mediated by social power and domination, by irrational fantasies of omnipotence, by legitimating notions of progress, and by contradictions rooted in the technological projects themselves and the social relations of production" (Noble, 1984, p. 324). The author thus warns against technological determinism and argues that understanding the fact that technology is itself a social construct can be liberating. If we choose to embrace this, people will be restored to their role as "subjects of history", but this fundamentally means accepting technology as "the vehicle and mask of domination" (Noble, 1984, p. 324-326). Noble's view draws inspiration from Marxist theory and mainly focuses on the mode of production specific to the age of large-scale industrial automation.

Another critique of technological determinism is that, because it utilizes technological artifacts as the *explanans* (but, in the case of Heilbroner, both as an *explanans and explanandum*), it makes the error of treating the process in which the artifacts become socially relevant innovations as a "black box". This is mainly because the technological artifacts taken into account in the explanations are, in almost every case, the successful ones, the ones that were diffused and adopted on a large enough scale. This leaves out questions related to the conditions in which certain technologies failed, questions which may lead us to valuable clues towards understanding the nature of technology (Pinch & Bijker, 1987, p. 24).

The model proposed by the social construction of technology theory seeks to explore this very aspect by attempting to understand what caused certain technologies to be selected while others not. In order to achieve this, the researcher must go through a series of inquiries. (1) The process of selecting certain technologies implies the existence of problems and solutions related to the technology; therefore, we must identify what these problems are; (2) From the constructivist point of view, these problems and solutions are the product of the meaning that the group concerned with the technological artifact gives it. Considering these two points, we have to identify the way in which the various social groups connected to the artifact define, firstly, the problem related to a certain technology and, secondly, what are the various solutions that are proposed for each problem. This generates a system of interrelations between the elements mentioned above, which eventually leads to the stabilization of the different artifacts, and finally to the selection of a technological artifact as an innovation (Pinch & Bijker, 1987, p. 29-39).

It bears to be mentioned, however, that the social construction of technology theory, as Pinch and Bijker point out, is not "a mold into which the empirical data have to be forced", but a model that fulfills, to some degree, a heuristic function and is useful for highlighting the multidirectional character of technological development (Pinch & Bijker, 1987, p. 39-40). For this reason, I believe that this particular methodology can provide us with a starting point for understanding the social construction of the filter bubble. In the next section below, I will go on to offer further details about how elective affinities related to ideology cause feed algorithms to produce political phenomena such as the *filter bubble.*

Ideological elective affinities and the filter bubble

Ideology is a highly disputed concept in political science and has sparked numerous debates on the role it plays in societies, which has been analyzed, in the past, from both value-neutral positions (e.g.: Parsons, 1951) and critical ones (e.g.: Marx, 1846). The perspective that I will utilize for this paper is based on the concept of "elective affinity", which is further explained by the psychological motives related to ideology: relational, epistemic and existential.

According to Jost, Federico and Napier (2009), elective affinities play a crucial role in understanding ideology and its function of providing individuals with a "shared framework of mental models" (Parsons, 1951, p.24), which they need in order to fulfill further needs. An elective affinity is defined as a "force of mutual attraction involving the structure and contents of belief systems and the motives of their adherents" (Jost et al., 2009, p. 309), and may constitute a viable explanation for the tendency of individuals to prefer being exposed to positions similar to their own.

The reason that I chose this concept over that of "confirmation bias" is that it provides a more suitable tool for the study of ideology, as it accounts for the relational, epistemic and existential needs of individuals and places less stress on the dichotomy between logical thinking and cognitive bias characteristic to the latter term, which I believe can be *overly simplifying* for the case. In the vision presented by Jost et al., the way in which individuals relate to ideological positions is not mainly determined by the lack or prevalence of pure cognitive errors – or, as is the case of the filter bubble, by vulnerabilities towards certain technologies – but by fundamental human needs.

Individuals are characterized by relational motives; that is, they desire to affiliate themselves with others and establish interpersonal relationships, and the fulfillment of this need means that they gained social identification, solidarity and a shared reality (Jost et al., 2009, p. 309). The relational need is reflected in the very design of social media platforms such as Facebook, which allow their users to easily establish connections with others, choose to be part of groups centered around certain topics, engage in discussions with like-minded people and share content that showcases the way they choose to identify themselves. As Quattrochiocchi et al. have previously illustrated, however, the interaction with users that do not share the "shared reality" described above tends to produce negative emotional reactions and further polarization (Quattrociocchi et al., 2016, p. 1). This may further reinforce the relational need for building an environment of social identification – and the characteristics of the technological artifact at hand strongly contribute to the fulfillment of this psychological need.

This is not, however, the only factor that weighs in on the way in which individuals interact with the technological artifact analyzed in this paper. The epistemic and existential motives, which are highly related to each other in this particular case, are one of the main aspect of this interaction. Epistemic motives are defined as "the drive to reduce uncertainty, complexity or ambiguity; cognitive preference for certainty, structure, order and/or closure" (Jost et al., 2009, p. 309), while existential motives refer to "the drive to manage threatening circumstances; a personal search for security, self-esteem and meaning in life" (Jost et al., 2009, p. 309).

These concepts reveal important characteristics of the users, characteristics which are neither exclusive nor specific to social media, but that could be unconsciously exacerbated through the effects of the feed algorithms.

(1) As stated above, the current design of the technological artifact at hand, with its feed algorithms, resonates with the *relational needs* that people display; this is fulfilled through the structure of the social media sites, which are based on voluntary connections, but also through the filtering that the algorithms generate, which "learn" from the previous interactions of the user and favorize content that are *expected to resonate with the user's values.*

(2) The epistemic motives are also a highly relevant aspect of the user's interaction with social media and possibly one of the needs (see the role of socially constructed needs I described in the previous section) that lead to the selection of the technological artifact. The filtering generated by the feed algorithms delves into the user's need for certainty, structure and order, by building a reality (the feed) that progressively becomes more and more aligned with their unambiguous version of reality, by weeding out opinions and information that could challenge it.

(3) Existential motives are one of the stronger needs that determine individuals to adhere to ideologies and display elective affinities. There is a strong need to symbolically transcend the anxiety induced by being aware of one's own mortality, and ideologies have the potential to offer a sense of meaningfulness and transcendence of the finite self that can provide the much-needed existential security (Jost et al. apud Greenber et al., 1997). We can infer that the secure space provided by the filter bubble can reinforce the feeling of existential security that ideologies offer, by exposing the users to values and ideas that trigger the sense of meaningfulness and transcendence previously mentioned.

These three needs are, according to Jost et al., the very motives that drive individuals towards self-identifying and interacting with a certain ideology. The recent discussion about the political polarization that the filter bubble has caused fails to account for this, accepting the technological artifact as the *explanans* without much consideration for how it was conceived and, more importantly, why it is preferred by the users, as there is also a degree of voluntarism in building the filter bubble and the users still have the option of independently choosing which sources of content are excluded from their feeds. The concept of elective affinity and the function of ideology in fulfilling relational, epistemic and existential needs may represent a possible solution for the artifact-as-a-black-box problem.

A last point I wish to make is related to the way in which the feed algorithms came to be. The algorithms themselves are not entirely understood, as they haven't been made public by the companies owning the social media platforms, but have been determined through a form of "reverse engineering". However, we known for certain that they were created by humans, humans who are in turn driven by diverse factors. They cannot escape their positions as members of society which are, in turn, moved by a combination of motivations. These motivations appear, on the one hand, from their condition as individuals defined by self-interest. On the other hand, they can also be shaped by their place in the communities they are part of, especially the professional community (Noble, 1984, p. 43). This can constitute another factor that weighs in the social construction of feed algorithms: the engineers and decision-making structure of the companies choose this specific feature for their platforms from a series other solutions for various reasons: they might want to respond to the needs of the consumers or they might have more instrumental reasons (the existence of algorithms also implies the collection of big data), or we may encounter a combination of both. Nevertheless, these factors, along with the needs of the users detailed above, have generated a certain design of the artifact

which, in turn, exacerbates the individual's tendencies towards developing elective affinities and manifesting them through the phenomenon of the filter bubble.

Conclusions

The filter bubble is not automatically the consequence of the design of the technological artifact, but an issue related to the very nature of the user. I believe that, by attempting to understand the filter bubble through the lenses of social constructivism, we will gain two pieces of knowledge. First of all, we will acquire more insight on the relevance and practical applicability of the social construction of technology theory, as we test it to a technological artifact that has only recently emerged and is different from other innovations through its digital nature. Second, it might contribute to better understanding the human characteristics that *stand at the base of the filter bubble*, which might in turn lead us to relevant information for designing solutions to the problem, which is the fact that the filter bubble exacerbates certain psychological tendencies and causes a level of polarization that is harmful to the democratic life.

This evolution towards highly polarized political interactions between citizens, adhering to different ideological positions, brings to mind the more critical views on ideology, such as Mannheim's particular conception which is the one implied "when the term denotes that we are skeptical of the ideas and representations advanced by our opponent. They are regarded as more or less conscious disguises of the real nature of a situation, the true recognition of which would not be in accord with his interests. These distortions range all the way from conscious lies to half-conscious and unwitting disguises; from calculated attempts to dupe others to self-deception" (Mannheim, 1936, p. 55).

One of the prerequisites for democracy is the presence of *public deliberation*. According to Meyer, this aspect is fundamental for a *non-passive society*: "the critical activity in a democracy is not the transmission of wants to leaders but the necessarily prior activity of determining popular needs in the first instance. The important function of participation is that it is the vehicle by which the citizen explores and tests needs within tlhe demanding arena of public affairs; the citizen learns what needs are" (Meyer, 1974, p. 207). Ironically, by attempting to bring citizens closer through this new means of communication, the Internet actually draws them further apart through the effect of the filter bubble.

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