



# “The Spy Who Loved Me”: A Qualitative Exploratory Analysis of the Relationship Between Youth and Algorithms

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This paper presents the results of a study which aims at understanding how social media platforms influence the formation of opinions of young adults (18–25) through content personalization. To do this, we problematize the so-called “filter bubble” phenomenon. We first go back to the literature and propose to depart from trying to assess the existence of and quantify the presence of filter bubbles on social media. We propose to focus on news use and access to content diversity related to political opinion formation and the impact of algorithms on the presence of said diversity. We then propose a theoretical framework—Activity Theory (AT)—for the understanding modeling the diversity of practices as well as the discourses regarding these practices of youth on social media regarding access to the diversity of content and news. In particular, the division of phenomena in three levels (operations, actions, and activities) is used to build up a canvas for a model that will be tested enriched with the new data. The so-called “pyramidal model” is also discussed and applied to our research topic. The third part of this paper summarizes the methods used to gather the data through a method we call “online *in praxis* interviews.” We then present the results, which show a relative knowledge of the mechanisms of content recommendations on social media as well as the tactics young people use to increase or mitigate them.

**Keywords:** Activity Theory, algorithms, filter bubbles, news consumption, personalization, recommendations, social media

## LITERATURE REVIEW: FILTER BUBBLES AND NEWS USE ON SOCIAL MEDIA

### Social Media and Filters Bubbles: Few Empirical Evidence

Recent years have seen the generalization of the use of social media platforms by individuals, of which teens and young adults are particularly intense users. In this regard, the presence on said platforms of automated information recommendation systems has generated criticism which denounces the risks of cognitive isolation these technologies may induce. In this line of argument, the personalization of recommended content based on the users’ behaviors causes a scarcity of information contrary to users’ opinions, thus facilitating the creation of so-called “echo chambers” (Sunstein and Sunstein, 2018) or “filter bubbles” (Pariser, 2011).

In the filter bubble theory, users are progressively directed toward content that provides direct satisfaction and maximizes the time spent on a platform to the detriment of the diversity of opinions encountered (Yeung, 2017). This is, of course, in the interest of private companies who sell that time and attention to other companies as advertising space. It is in that way that, in this theory, algorithms are designed to give you “what you want whether you want it or not” (Pariser, 2011). In this regard, it seems that studying teens and young adults is of specific importance since it is at that age, they might vote for the first time and engage with politics. If filter bubbles influence opinion making then it influences our political systems and the public sphere (Mercenier et al., 2022).

The concept of “filter bubbles” became popular over the last 10 years in the research community because of the intensification of the use of social media platforms and the generalization of the presence of algorithms. Furthermore, major political events, including the elections of Donald Trump in the US and Jair Bolsonaro in Brazil or Brexit in the UK, and more recently the Covid-19 pandemics, the confinements, and vaccination campaigns throughout the world have been said to have been greatly influenced by social media contents and their diffusion controlled by algorithms. Researchers therefore set out to detect and assess the power of filter bubbles in individuals’ news use. These studies invite us to question the validity of this theory—or at least importance of the phenomenon—and the assertions that underline it (Mutz and Young, 2011; Zuiderveen Borgesius et al., 2016; Moeller and Helberger, 2018; Barberá, 2020).

Indeed there lies a paradox: algorithms on social media platforms can influence the feed of their users but users can equally influence it based on the data they provide and their interactions with other users’ content (see Claes et al., 2021, for an in-depth discussion of this paradox). These results, which are disparate to say the least, underline the need to adopt a more global socio-technical perspective in the study of how news is accessed online. The analysis of uses cannot be limited to the evaluation of a single platform and must be able to encompass a broader ecosystem capable of revealing all the nuances and issues specific to these technologies. On this basis, it is advisable to develop a critical look at the “filter bubble” phenomenon. To do so, we analyze our data through the lens of the notions of news diversity and news personalization.

## From Filter Bubbles to News Diversity and Personalization

Historically, the purpose of formalizing recommendation systems was to optimize the content a user would receive online. To do so, recommendation systems were built to predict and assign a score to objects and to recommend the object with the highest score to said user. This logic was then extended to many areas in order to be able to target as precisely as possible the content most likely to satisfy the user and, in most cases on social media, to capture his attention for as long as possible. However, there is a paradox here: capturing and keeping attention can bring direct satisfaction to a user but can also generate long-term dissatisfaction. In other terms, content personalization can

hinder the variety of content one has access to, which is one of the reasons users go on the Internet and use social media. Indeed, the way these systems are built makes them offer content similar to what has previously been consumed.

Empirical research on news personalization shows somewhat contradictory results. While some argue that the personalization of searches online has little impact on content diversity and results of searches of different types of users often overlap (Haim et al., 2018; Krafft et al., 2018; Puschmann, 2019). Others, on the other hand, observe a decrease in the diversity of press articles consulted as a result of the use of customization tools (Dylko et al., 2017; Claussen et al., 2019). On Facebook, Bakshy et al. (2015) observe a decrease in exposure to contrary opinions caused by the algorithm. However, the choice of users’ social relationships would also result in a decrease in exposure, the effect of which would be greater than the one caused by the personalization of the news feed. Aiello and Barbieri (2017), however, note a greater diversity of consumption by Users of Flickr and Tumblr following the use of automated recommendations. Some studies of musical recommendations show a decrease in individual diversity (Anderson et al., 2020) while others found an increase in aggregate diversity of all content viewed by a user’s community (Holtz et al., 2020). On YouTube, a recent study concluded that the graph formed by the network of non-personalized recommendations tends to confine users in groups of homogeneous videos (Roth et al., 2020). These observations are in line with the Ledwich and Zaitsev (2019) finding that the recommendations tend to redirect the user to more dominant, mainstream media. These disparate results focusing each on a specific technology underline the need for more comprehensive research on the phenomenon, encompassing users’ news diets in complex environments.

To better understand the impact of content personalization on those environments, the concept of content diversity is often linked to those of filter bubbles and echo chambers. However, research has defined diversity in various terms: diversity of sources on multiple platforms, diversity of opinions a user has access to, diversity in terms of genre, race, and social status of people users get in contact with, etc. Within the framework of this research, we will use the notion of diversity to describe the access to various sources on a given platform. Our assumption is that diversity in sources will in the long run provide users with diversity of opinions and people in contact with, and that access to a diversity of sources leads to less polarization on social media and reduces filter bubble and echo chambers effects.

In general terms, research on content diversity shows that the use of such systems on social media does not always seem to be synonymous with a lower diversity than an editorial selection (Moeller and Helberger, 2018). Moreover, the importance of the algorithmic factor in the composition of the news diet of users is to be nuanced because of the amount and diversity of sources available online (Napoli, 2011) as well as the importance of so-called weak links (Granovetter, 1973) on social media (Messing and Westwood, 2014; Bakshy et al., 2015). The diversity of media producers and national policy can also impact the informational

ecosystem offered to users (Boczkowski and Mitchelstein, 2013; Garrett, 2013).

Based on these observations, we aimed at designing a study that uses the tools of Activity Theory (AT) and a novel methodology, to gather insights on if/how young perceive news personalization and how they act on it. In the context of this paper, we focus on how they try to increase personalization or on the other side, to resist and mitigate its effect.

## RESEARCH INSTRUMENT: USING THE TOOLKIT OF ACTIVITY THEORY TO UNDERSTAND YOUNG PEOPLE'S PERCEPTIONS AND PRACTICES ON SOCIAL MEDIA

In order to study how young people (18–25) perceive and act on content personalization on social media, a set of tools focused on AT can be mobilized. Rather than limiting the study to the description of young people's opinions, Activity Theory allows us to make sense of teenagers' practices regarding their perceptions, motives and goals. Each operation made by someone on their device is enacted with the aim to fulfill a goal (consciously or unconsciously). AT permits to analyze the uses of social media by focusing on a micro-level unit of analysis, and to make sense of it on a broader scope. A general background and the fundamentals of AT are first introduced before a clear operationalization of some of the tools provided by AT is suggested.

### Background

Activity Theory, also known as cultural-historical AT, is a conceptual framework (or more precisely a disparate set of concepts, models, and tools) aiming at studying the relationship between what a human being thinks and feels on the one hand, and what they do on the other. As the name suggests, this theory focuses on the activities of human beings by considering the importance of the cultural and historical context of such activities. This theoretical framework can thus be mobilized to model the diversity practices of youth on social media regarding content personalization, but also to understand their perception of their uses through their discourses.

The use of AT in communication research is scarce up to now for two main reasons. The first reason is that AT is first and foremost a conceptual framework that is anchored in the psychological field since its inception as early as the 1920s, as the idea behind this conceptual framework was to better understand the mechanisms of the human mind behind the actions and activities of human beings (Roth, 2014). Activity Theory was suggested by soviet researchers who referred to concepts and methods from the field of psychology. In turn, their work was later adapted and furthered by psychologists, and it is only in the 1990s that AT percolated to other fields of research, and especially education research (Bakhurst, 2009). The second reason can be explained by socio-historical factors. The growing success of AT in the 1990s is explained by historical factors. As mentioned, AT was developed in the USSR in the 1920s and 1930s. This particular context contained in some ways

this conceptual framework inside the soviet borders. It is only thus with the fall of the Berlin Wall in 1989 that AT became more apprehensible for researchers from Western Europe and North America.

Activity Theory is thus not a novel framework but rather one with a unique history. This history is marked with four different generations of activity theories, each one marking new turns in the comprehension and the application of the framework. The main invariants from these different generations are the focus on understanding the rationale behind human actions. This understanding is not solely based on analyses on an individual basis, but also from a more global and societal perspective. Activity Theory emphasizes the importance of the relationship between culture and history on the one hand and individual actions. Also, the evolution of the concept of activity has led to the design of various models and instruments that allow the study of activities in detail. More than a broad theoretical framework, AT allows one to methodically describe the place and the role of a human being within a social phenomenon, by observing micro-level units of analysis (operations) to understand a goal-oriented action, which in turn explains an activity. This latter element is key in understanding how the activities of youth on social media—such as socializing and getting informed or entertained—is shaped by micro-operations such as clicks and scrolls, and vice-versa.

### The Fundamentals of Activity Theory

Four different generations of AT can be distinguished in the scientific literature. The most important generation on which most key concepts are used in this study is the third generation led by Engeström (1999). Nonetheless, it is important to briefly describe the roots from the first and second generations of AT to fully perceive the explanatory power of AT for our research. It is worth noting that this research does not address the current debate regarding the so-called fourth generation of AT as much disagreement currently exists on what such a new generation comprises in theoretical, empirical, but also epistemological terms (see Spinuzzi and Guile, 2019).

The first generation of AT can be traced back to Soviet psychology in the 1920s and 1930s, and more specifically to Lev Vygotsky. Heavily influenced by Marxist philosophy, he developed with colleagues the socio-cultural perspective in Russian psychology. This school of thoughts, which contrasted with the views generally propounded in Russian psychology, had the objective to overcome the border between the human mind on the one hand, and culture and society on the other (Kaptelinin and Nardi, 2012, p. 12). In other words, the objective was to analyze the link between humans' conscious experiences and humans' action in the world. Vygotsky's most fundamental argument is that culture and society are not simple external factors influencing the human mind. Rather, culture and society are responsible for the very production of the mind. This postulate implies that our relation to technology materially shapes who we are and become (Kaptelinin and Nardi, 2012, p. 14). Therefore, technology is not merely a collection of tools designed to help human beings. Rather, human beings develop intimate relations with and to technology. Vygotsky's approach to

study activities was thus based on the idea of mediation, “in which an individual could control its own actions using physical or psychological tools” (Spinuzzi and Guile, 2019, p. 2). Vygotsky’s model of AT can therefore be designed as a triad between a subject, an object, and a mediation tool.

The second generation of AT revolves around the works of Alexey Leontiev. A student then friend of Vygotsky, Leontiev has furthered and refined AT. Whereas, Vygotsky’s approach was deeply anchored in the field of psychology and remained rather abstract, Leontiev strived to be more systematic in his approach to AT and defined specific notions and concepts which became the basis for the subsequent generations of AT. As Miettinen (2005) explained, “Leontiev (1978) introduced the philosophical concept of practice, or ‘objective activity’ into psychology to reconsider its foundations, and in this context, he elaborated the concept of the object of activity.” Three main principles emerged from Leontiev’s work on AT:

- *Object-orientedness*: The concept activity relies heavily on the relationship between a subject and an object. In AT, this relationship is understood in the sense that a subject’s interaction with the world is structured around objects. These objects should not be limited to tangible artifacts. Learning a new language is an instance of an object. According to Leontiev, the principle of object-orientedness states that “all human activities are directed toward their objects and are differentiated from one another by their respective objects” [Kaptelinin and Nardi, 2012, p. 29]. Objects therefore motivate and direct activities.
- *Hierarchical structure of activity*: A major insight from Leontiev’s approach is the consideration that all human activities are organized into three hierarchical levels. Activities are composed of actions, which are in turn composed of operations. Each level is oriented toward a specific need. Activities are directed toward a motive, actions toward a goal, and operations are oriented to accomplish the conditions needed to attain a goal.
- *Activities can be apprehended from an individual perspective as well as from a collective perspective*. The anchorage in the socio-cultural context in which Leontiev developed his model has been influential in the significance of the division of labor. His seminal example illustrates how people can perform distinct actions with distinct goals but participating in the same collective activity.

It is Yrjö Engeström, a Finnish researcher, who picked up AT from the Soviet Union and engaged in spreading what he considered “the best kept secret of academia” (Engeström, 1993, p. 64) to the Western world in general and Scandinavia in particular, so much so that the third generation of AT is often referred to as Scandinavian AT. Building on Leontiev’s work, Engeström has strived to be more systematic and structured in defining AT and has suggested the activity system model, which includes a third entity: the community, in addition to the two identified by Leontiev (the individual and the object). Engeström perceives indeed a collective dimension of activity systems. As Kuutti explains: “*The solution offered by Activity Theory is that a minimal meaningful context for individual*

*actions must be included in the basic unit of analysis. This unit is called an activity. Because the context is included in the unit of analysis, the object of our research is always essentially collective, even if our main interest were in individual actions.*” (Kuutti, 1995, p. 24). This dimension of collectivity will be central in Engeström’s most notorious contribution to AT that is the schematic representation of activity systems. In this representation, six elements are interconnected (see the pyramidal model below).

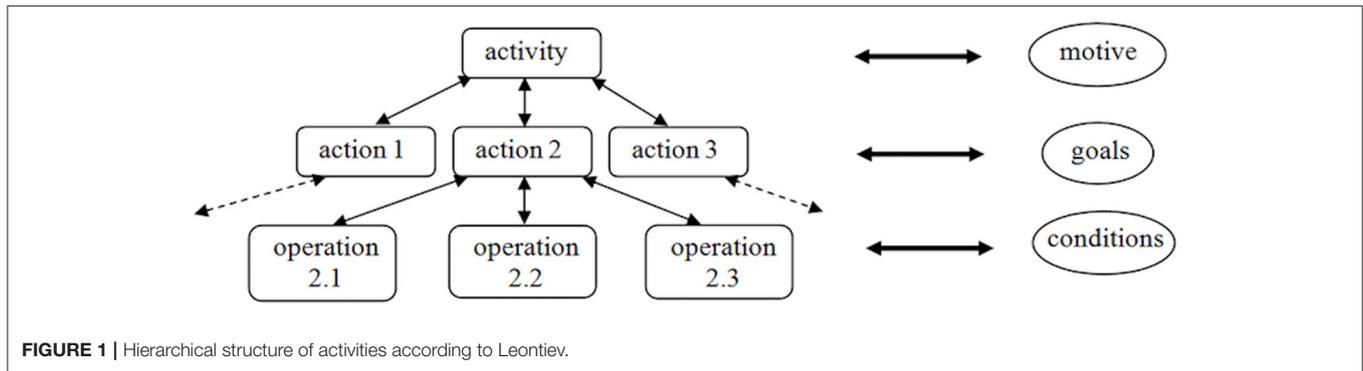
Engeström’s work will be instrumental in the development of AT in the West and in its appropriation by other disciplines than psychology (Engeström et al., 1999). In particular, the fields of human-computer interaction (Kuutti, 1995; Nardi, 1996; Bedny and Karwowski, 2003; Kaptelinin and Nardi, 2018) and education (Martin and Peim, 2009; Krause, 2018) have mobilized AT as a conceptual framework as well as a methodological device. Conversely, in the field of sociology, media, and communication, research mobilizing AT remains scarce (Yardi and Bruckman, 2011; Hujanen, 2013). It is in this perspective that AT is mobilized in this paper in order to understand the activities of youth on social media and their perception of such activities. Next section details the key elements that are borrowed from AT and the operationalization into a method to collect, organize, and analyze data in the current research.

## Mobilizing at for Understanding Youth Mobile Uses in an Informational Ecosystem

In this section, two key elements from AT are defined as they serve as instrument tools to collect and organize data in this research. The objective is to explain the concepts in light of the background mentioned in section one and to explain how these tools are understood and are used in this study.

First, AT proposes to classify hierarchically practices and discourses related to them, as already defined by Leontiev (Figure 1). The idea is that activities are constituted by actions, which are in turn made of operations. Each of these levels have a specific need. This model contains an explanatory power when applied to our research.

In this model, *operations* are routine processes providing an adjustment of an action to the ongoing situation. They are oriented toward the conditions under which the subject is trying to attain a goal. People are typically not aware of their operations which are performed unconsciously. *Actions* are conscious processes directed at goals which must be undertaken to fulfill the object. The top layer is the activity itself, which is oriented toward a motive, corresponding to a certain need. The motive is the object that the subject ultimately needs to attain. In the context of this research, we focus on the activity of “getting informed” and more precisely how the personalization of feeds on social media platforms is perceived through this activity. Other relevant models exist within and around AT to analyze activities in a social context (see Norman, 1986; Bishop, 2007; or Karakus, 2014 for a review within AT) which will be explored in the future. However, the exploratory and qualitative nature of our research invites to focus on this quintessential model.



Second, the pyramidal model of AT formalized by Engeström is borrowed and applied to our study (Vahed et al., 2018, based on Engeström, 2015). The pyramid is made of two triangles interconnecting six factors to understand an activity. The *subject* is the person engaged in an activity and which has an *object*. This object is motivated and is aimed toward a desired outcome, such as having a social life, making friends, staying informed, and so forth (in our case staying informed). As explained in the third generation of AT, an activity is also shaped by a *community* of people more or less concerned about the activity. The social aspects of platforms and apps such as Instagram and Youtube highly emphasize that notion of community. The *tools* are the physical objects such as smartphones, but also systems and symbols used to accomplish the activity. Rooted in a soviet context, AT also focuses on the *division of labor* of the activity, as well as the *rules and laws* allowing the activity to be performed. These rules can be explicit such as “Terms and Services” to accept or implicit and socially dictated by a community. Applied to this case study, the AT model for youth using smartphones and platforms is illustrated in **Figure 2**.

Put briefly, AT allows us to study the diversity of discourses and practices of youth on social media regarding access to news, but also to understand their perception of their uses through their discourses. It offers a hierarchical model allowing to deconstruct the activity of young people into actions and operations. In that sense, the practices can be observed and explained at a micro-level and simultaneously give insights about its activities at a higher level. Also, the pyramidal model offers a broader model of analysis, which serves directly in the operationalization of the research design and offers a lens to collect and analyze the data from the field.

## Research Design: Online In-praxis Interviews

The rationale of this research is to better understand the influence that personalization can have on youth in terms of opinion-making and media uses. A first study led by the authors mixed traditional semi-structured interviews and focus groups. These methods proved useful in producing knowledge on the diversity of social media uses: the diversity of platform use, the diversity of practices, and the variation in consciousness of the (algorithmic) mechanisms at play on social media platforms. However, the

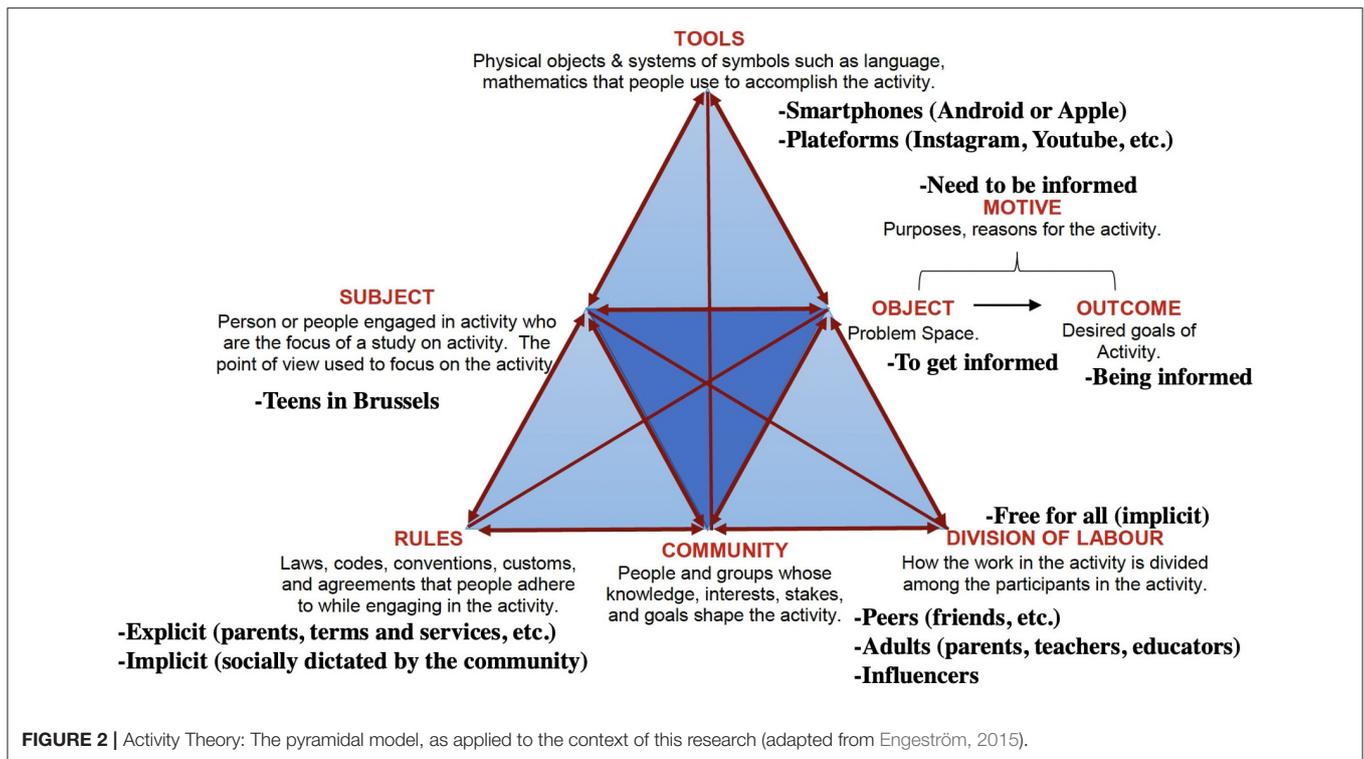
methods used in this first study came short in generalizing and providing explanatory models. For that purpose, a new method has been designed drawing on aspects from various research designs that have been identified in the literature on AT. This method has been coined “online *in praxis* interviews.”

In order to overcome the shortcomings of traditional semi-structured interviews, we have designed a method mixing semi-structured interviews and the realization of an activity by going through the different levels such as actions and operations. Engeström (1987) justifies that studying activity systems requires qualitative methods allowing to study activities at a micro-level, but giving explanatory power at a macro-level of an activity system:

“Activity system as a unit of analysis calls for complementary of the system view and the subject’s view. The analyst constructs the activity system as if looking at it from above. At the same time, the analyst must select a subject, a member (or better yet, multiple different members) of the local activity, through whose eyes and interpretations the activity is constructed. This dialectic between the systemic and subjective-partisan views brings the researcher into a dialogical relationship with the local activity under investigation. The study of an activity system becomes a collective, multivoiced construction of its past, present, and future zones of proximal developments (Engeström, 1987, p. 10).”

In the field of education sciences, alternative or complementary methodologies are often used to study youth uses and perceptions of technology (see for example Conole et al., 2008). Concretely, in order to study young people’s use of social media to get informed, we invited them to realize a few operations on their smartphones and to share their observations. Rather than obtaining a general, and sometimes biased, discourse of youth regarding their uses, the goal was to confront them to their feeds resulting from their uses. We call this method *in praxis interviews*, in contrast with ethnographers *in situ interviews*, to emphasize the importance of performing the activity during the interview and reflecting upon it live.

Asking participants to perform an activity is not novel *per se*. The existing literature on AT already points to different methods relying on such practices. A few instances are briefly presented hereafter, as they have inspired our methodology and could benefit for further research on the topic. First, we can mention



methods proposing a *walkthrough* by the participant. This method, often used in human-computer interactions studies, presents a clear list of tasks for the participant to solve. Often designed to identify flaws in programs or softwares, the walkthrough method is also useful in mobile communication studies to better understand how users interact with their interfaces (Light et al., 2018). Along the same lines, Jørgensen (2016) suggested the *media go-along* method. Anchored in an ethnographic perspective, the objective of this method is to shadow a participant while he is using his media. Finally, two methods that are similar in some ways focus on the spontaneity of participants when realizing an activity. Alshammari et al. (2015) used the *think-aloud* method, by which participants are invited to perform a set of tasks while saying out loud what they are thinking and what their trains of thoughts are. Think-aloud methods are often used in the field of Human Computer Interaction in order to test the usability of an interface or a software system. However, the think aloud methodology is not new as it was already used in multiple fields in the 90's, such as usability studies. Users were then asked to think aloud while performing certain tasks on an interface to understand not only what users do but also why (Nielsen, 1994). The objective of the think-aloud method is to observe the use of an object by a user and to detect the affordances and obstacles of using it. Along the same lines, Zahner and Moschkovich (2010) introduced the concept of *private speech* in order to describe the words and sentences that a user emits to oneself, but aloud.

Bringing together different aspects of these methods, *in praxis interviews* aim to invite participants to perform simple

tasks on their smartphones in order to confront their imagined mobile practices to their actual practices and knowledge about how platforms, interfaces, and algorithms work. Due to the governmental measures regarding Covid put in place during the data collection period, interviews had to be realized online, which paradoxically allowed us to easily record them.

The interview guide covers three main themes. First, questions about news use are asked in order to understand the individual's media ecosystem (which platforms they use, which type of news they consume, etc.). This brings general information about the activity of consuming news as well as more detailed information about the media and the platforms they use to get informed. Second, participants are invited to use their smartphones on three applications: Instagram, Facebook, and YouTube. These three platforms have been selected based on findings from an earlier research project led by the authors. This second part, more practical, allows the depictions of actions and operations of the individuals on these platforms, and to question their perceptions about these platforms. They are then invited to describe what they see on their feeds, and to discuss how they thought these contents were selected (or not) for them. Finally, reflexive questions are asked about how they understand recommendation algorithms and about the tactics they put in place in order to resist, or to accentuate, the effects of these algorithms.

As an exploratory qualitative study, 13 online in-praxis interviews have been conducted for this paper. The participants were selected using a "snowball sampling" recruitment method as advisable in this case (Naderifar et al., 2017). The

interview guide used had been tested and refined through six pre-tests interviews. It must be noted that the 13 interviewees whose results are detailed here are all living in Brussels, Belgium, with an age ranging from 18 to 25. This must be taken into consideration when analyzing the practices of the participants on their smartphones and their knowledge of political and media ecosystems. In this article, we used pseudonyms to refer to the interviewees in order to guarantee the anonymity and the confidentiality of the participants.

## RESULTS: BETWEEN RESISTING PERSONALIZATION AND GETTING ADAPTED CONTENT

Aside from Google and non-digital media, contextual results show that youth massively use Instagram and YouTube for news and entertainment as well as interpersonal communication. Facebook is used less often and in a more passive manner. Some began to use Tik Tok at the time of data collection. They also converse through WhatsApp, Snapchat, and Messenger.

### Implicit Knowledge of How Personalization Works and Ambivalent Feelings Toward Algorithms

In the first part of this paper, we have presented a literature review of the concept of filter bubbles and recommendation algorithms. Preliminary findings show that youth have an implicit knowledge of how personalization of feeds on platforms such as Instagram work, and that discourses on the negative effects of filter bubbles or echo chambers should be tempered. In this section, the discourse of 13 youth is discussed about how they feel about recommendation algorithms and about their practices.

First and foremost, the 13 young adults claimed to be conscious about how platforms such as Instagram, Facebook and YouTube operate and that their data were being collected. Even though some expressed a certain discomfort in that regard, the fact that these platforms were free of use counterbalanced that unease, as explained by Melinda: *“I’m browsing a free media outlet, so, hum, they have to earn some money somehow. By using our data to propose content that we like, we consume a lot without paying.”* This is further detailed by Julie: *“I very well know that my consumption is being watched, so to speak, and that the content that is suggested to me is directly linked to my centers of interests. I mean the sponsored things there, there is a link.”*

Regarding how recommendation algorithms work, most participants were fairly confident about their modus operandi globally even though they admitted not knowing exactly how and why certain posts appeared in their feed. This shows that they have an implicit knowledge about the rules of algorithms, even though the appearance of certain contents keeps them upset. For instance, Bérénice explained how she was looking for some information about unclogging a sink and how, even though she had found the answer, she kept seeing ads and sponsored content about sink unblockers: *“For example, I was looking for some tips*

*to unclog a sink ecologically. And now, on YouTube, I have a lot of advertisements on sink unblockers even though I searched it only once. I’m telling myself, why is it there?.”*

This personalization does not surprise these individuals as they are conscious that their behavior online will have an impact on what they will see in their feed. As Melinda explains, this phenomenon can be considered as common knowledge: *“I checked those shoes this morning and now, they are suggesting them to me, as if by chance. I think that by now, anyone knows that it’s not by accident.”*

In some respects, the personalization of the feed is accepted by some of the interviewees. For Julie, the way Instagram arranges her stories is even beneficial, as she perceives that the stories she considers most important, that is of her friends, are being presented first: *“Well It’s true that, for instance, the stories that are at the end, I never watch them. Because it’s a waste of time. Well, not a waste of time but I only look at essential things from my friends. For example, often, on Instagram, they post the stories of my close friends first, so I see them first.”*

However, if this personalization of the feed is expected, it does not mean that youth necessarily enjoy it as they sometimes feel like being trapped. Maria shared this impression after visiting a specific restaurant in a shopping mall one morning and receiving targeted advertisement about this establishment on her smartphone later during the day: *“If for example I’m connecting myself to City 2 or to a restaurant, a bit later I have an ad for that restaurant. Or we’re inviting me to go to City 2. And those are things I don’t necessarily like, feeling tracked.”*

Feeling trapped is not the only pitfall of recommendation algorithms according to our participants. One element that kept emerging during the interviews is the growing preponderance of advertising and marketing of products. Especially on Instagram, Maria explains how she feels like content from stores are being pushed up in the feeds with pictures and links to products to buy rather than content posted by her friends: *“I’m really under the impression that all the stores selling articles that when you click on the pictures, there is a link, they are much more highlighted than photos of ordinary people on Instagram.”*

The question of filter bubbles and feeling trapped inside a bubble was also commented by several interviewees. For Nadia, this phenomenon can be considered as annoying because she feels she always sees the same things over and over: *“I always see the same things, it becomes a bit... annoying.”* This feeling can have effects that are much more damaging than boredom as Nadia explained how the overflow of information on Facebook, especially on topics related to current events and problems happening in the world influenced her mental health: *“Personally, my mental health wasn’t going so well. I figured that it was too much, what you have on Facebook. There is a gigantic flow of information.”*

Rather than feeling trapped inside an informational bubble, Melinda explains how consuming political information on Instagram has helped her understand the US elections, and especially in comparing how young Americans and young Europeans lived the Biden campaign: *“So to see the contrast between what we, Europeans, thought of the elections and what*

**TABLE 1** | The hierarchical model of getting informed on social media.

Activity	Actions	Operations
Getting informed	Liking (post, person, or page) or following	Tapping (on buttons or digital keyboard)
	Commenting	Double tapping
	Sharing (on feed or by message)	Scrolling
	Publishing (texts, photos, videos, stories)	Zooming (in or out)
	Not liking	Not doing anything
	Writing (search bar)	Viewing/looking at

*Americans did, well the young people. What they thought about it was interesting because it was completely different.”*

In sum, the interviewees all showed an implicit knowledge of the basics of the recommendation algorithms. They were all conscious that the content that is presented to them is tailored to their previous activities such as likes, subscriptions, networks, and comments. They are aware that all the operations they perform online have a consequence on the content and the sponsored messages that they see. If the personalization of the feeds can sometimes be considered as annoying and not relevant, participants understood the underlying reasons and have developed tactics in order to temper or accentuate how the algorithm works.

## Simple Practices Yet Powerful Tactics to Modify Algorithms

Despite interviewees often referring to themselves as not being tech-savvy, all of them have developed practices and tactics to alter the effects of recommendation algorithms. Either for reinforcing the personalization of the feed or conversely for reducing it, their behavior on social media is shaped by operations that are geared toward actions taken to resist or not algorithms (Table 1). These tactics range from specific operations such as clicking on the “unfollow” button of an account to more drastic measures such as deactivating their own account altogether. The operations and actions observed during the online in-praxis interviews concur mostly with the ones identified in the existing literature on the topic.

## Between Resistance and Acceptance: Young People Ambivalent Relationship With Social Media Platforms in a Connected World

The tactics illustrated in the previous subsection show the ambivalent relationship that youth have with social media and recommendation algorithms. Whereas, some users enjoy to a certain extent the opportunity to have a selection of contents that might interest them the most, others show skepticism toward the collection and the use of their personal data.

It appears from the interviews that resistance tactics often emerge after an overload of information. Anna explains how she decided to unfollow a news media account because of the sad

news that kept being presented on her feed: *“I follow the RTL account, but I stopped because it’s depressing. Most of the time, it’s negative news stories, so I unfollowed them.”* Along those lines, different users explained adopting a resisting behavior regarding the growing marketing aspects of social media accounts. Indeed, after a certain time, Interviewee 1 explains how she reflected on her online behavior and made the decision to deactivate her Instagram account because she felt she was losing time contemplating products that she did not need anyway: *“On Instagram, I am following many influencers from reality TV shows, talking about make ups, wigs, exactly what push you to consume more. So that’s another reason why I deactivated my account. I didn’t want to buy useless stuff.”* This example shows how youth develop critical thinking about their consumption of social media. At numerous occasions, participants explain how surprised they were when looking at the time they spend on social media. They pointed out that social media platforms were clever in the way they develop their applications to keep the attention of their users, including the development of shorts videos that are easily watched one after the other, such as on TikTok or Reels on Instagram. Participants admitted having been surprised to have been scrolling during 1 or 2 h watching short clips before realizing it and putting their smartphones aside as a result. Melinda expressed being not at ease in those moments: *“Me, I feel bad when I realize it’s been a long time that I’m scrolling down. Then I stop, I put my smartphone away.”*

Paradoxically, some users develop both traits of resistance and acceptance, which blurs the line even further regarding their relationship with social media platforms. For instance, Melissa explains her feelings toward her smartphone and how sometimes considers herself as being traced: *“actually my smartphone itself is like a chip tracking my movements. We are not free anymore. So sometimes, I don’t take my phone with me.”* As a way of resisting, she then explains how she decides to leave her smartphone at home sometimes in order not to feel tracked. What she explains later during the interview seems dissonant though. Indeed, the interviewee explains how she recently downloaded an application that gives her money when she walks with her smartphone: *“I downloaded an app that gives you money when you walk.”* Whereas, she first explained feeling traced with her smartphone and having to develop tactics such as leaving her phone home, she then explains how she found a financial incentive to actually share her location data with an app. This example shows how ambivalent the relationship is between youth and their smartphones, and about how they sometimes develop tactics to resist certain aspects of a connected world and how they actually give in and encourage such a world.

The question of resistance or acceptance cannot be subsumed to a binary view. What became patent during the interviews is that participants all had different levels of consciousness of recommendation algorithms and had varying ways of considering it important or not. For instance, when Harry said that he had many friends on Facebook and that he found it only logical not to see everything that his friends post, he expressed some discomfort of being nudged toward certain contents over other, but that he did not really care: *“On Facebook, I don’t know how many friends I have, but I don’t see everything they post. - Does*

it bother you? Well, yes, no, well, maybe the concept is bothering me. The concept of being nudged toward certain contents. But does it bother me? Not that much.” Other participants were more defiant about the way social platforms decided what was considered as relevant or not. Tony reveals how an account that he follows, which is arguably anti-globalization, claimed that it was censored by the Facebook algorithm and suggested tactics to make sure that their content would be visible: “There was an article recently published by Mr Mondialisation that says the Facebook’s algorithm was keeping their followers from seeing their articles.”

## DISCUSSION

The objective of this paper was three-fold. First, we aimed to analyze the perception that youth have regarding recommendation algorithms. Second, we confronted their discourse to their actual behavior on different social media platforms thanks to an innovative methodology called online in-praxis interview. Third, the goal was to analyze the tactics that youth put in place in order to limit or accentuate the effects of recommendation algorithms.

At the theoretical level, this paper links AT to the field of reception studies and particularly of news consumption. Often cited in the field of education, mobilizing AT in this research allowed us to better understand the activity of consuming information on smartphones, but also to add different levels of analysis such as actions and operations that in turn offer a better understanding of the activity itself. It is our belief that other researchers could be inspired by this approach and use it in disciplines such as marketing, political communication, journalism and media studies, and social sciences in general.

At the methodological level, online in-praxis interviews offered new ways of conducting interviews that permit to go beyond the discourse that youth have regarding their perception of social media use. Rather, by asking them to perform tasks,

it was possible to better understand how they operate on social media and how they develop tactics, consciously or not, in order to modify the effects of algorithms. The limit of this method resides in the current sample, which is limited to university students who are students in political science and communication studies, which could imply a greater consciousness of how algorithms work.

In terms of results, it appears that young adults develop an ambivalent relationship with recommendation algorithms. Some develop tactics to resist the choices operated by algorithms and others actually encourage more personalization of their feed. The interviewees all showed an implicit knowledge of the basics of the recommendation algorithms. They were all conscious that the content that is presented to them is tailored to their previous activities such as likes, subscriptions, networks, and comments. They are aware that all the operations they perform online have a consequence on the content and the sponsored messages that they see. If the personalization of the feeds can sometimes be considered as annoying and not relevant, participants understood the underlying reasons and have developed tactics in order to temper or accentuate how the algorithm works.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

## AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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