

Young audiences and climate change. Communication analysis in different public arenas

Dimitrina J. Semova, Gemma Teso Alonso, Nuria Villagra García, Jorge Clemente Mediavilla, Alejandro Costa Escuredo, Ana Reyes

Received: 3 August 2023 | Accepted: 28 October 2023 | Published: 21 November 2023

1. **Introduction: key concepts**
 2. **Methodology**
 - 2.1. Research technique and corpus.
 - 2.2. Variables
 - 2.3. Research questions
 3. **Results and discussion**
 4. **Conclusions**
-

Keywords: public arenas; climate change; young audiences; environmental activism; social platforms.

Abstract. *This article focuses on the agenda on the different public arenas in relation to the climate change discourse from the perspective of the young audiences: mass media arena, collaborative-activist arena, personal arena, and discussion arena. The variables represent the different axes of environmental sustainability, summarizing the Sustainable Development Goals of the 2030 Agenda and applied to the field of the media and communication. Research*

questions are related to thematic categories and level of engagement both, on the traditional media arena where young audiences are mere users of news and messages, and the public arenas where they turn out to be generators of information. The results show that mainstream media pay less attention to environmental issues from the perspective of activism, social justice or culture, and this can be a problem when it comes to connecting with young audiences which are very active and gives widely feedback for issues that have to do with these particular approaches and which are predominant on other arenas formed by social networks such as Instagram, Twitter and TikTok. Activism (climate action) turned out to be the topic that generates the highest level of response/engagement.

1. Introduction: key concepts

The public sphere is a forum where deliberation processes happen and where the premises of *dialogue* and *consensus* become the central objectives of the *communicative action* (Habermas, 1962, 2010). With the rise of the digital space, the concept of differentiated public spheres has been reconsidered and new approaches have gained force. Schmidt (2013) focuses on interpersonal and mass media communication and their capacity to generate public arenas: *mass media*, *expert*, *collaborative* and *personal arenas*. Based on Schmidt, Lörcher and Neverla (2015: 21) propose a distinction between *mass media arena*, *expert arena*, *discussion arena* and *mass media-induced discussion arena* (MDA):

The Mass media arena has high barriers for communication and a dispersed anonymous audience as seen on journalistic websites. The communicators are usually journalists. The Expert arena also has high barriers for communicators and its audience is an expert community consisting of, for example, scientists or other specialised groups. It contains specialised information such as scientific journals or expert blogs. The Discussion arena - which is our extension of Schmidt's concept - is characterised by low barriers to communication and an audience that has not been further specified. Since access to communication is open and equal for everybody, diverse stakeholders can be found here. The MDA includes Discussion arenas with initial mass mediated input. e.g. reader comments found on online news media (Lörcher & Neverla, 2015: 21).

The effect of the online environment and social networks on human population has also focused the attention of several studies from an anthropological perspective (Geismar & Knox, 2021; Miller, 2016; Miller, 2021). Thus, Geismar & Knox (2021) shed light on the concept of digital anthropology as a stream of research that analyses the impact of digital technologies on the concept and experience of human beings.

Various studies point to social media and television as the main sources of information on climate change (Teso, 2021). Specifically, the results of the transnational study Digital News Report 2022 published by the Reuters Institute of the Oxford University, confirm that audiovisual content broadcast by the media continues to be the main source of information on climate change for citizens, including young people, although this group is more likely to seek alternative online sources of information and to follow activists and celebrities, who are becoming new communicators on the social media scene.

In this study we will focus on the agenda on the different public arenas in relation to the climate change discourse from the perspective of the young audiences: *mass media arena*, *collaborative-activist arena*, *personal arena* and *discussion arena*. Under *mass media arena* we understand the online edition of the mainstream media where the information in circulation is elaborated by journalists; that is, trained and accredited professionals. The *personal* and *collaborative-activist arenas* are related to social media platforms as communication tools. In the first case, we will focus on the arena formed by TikTok and, in the second, by Instagram and Twitter. We consider, on the one hand, that the arena formed by TikTok contains specific characteristics and must be analysed separately, and on the other hand, that this network is based on the individual interest of the user, which gives it this personal feature. It has a unique “For You” page, where most of the content viewed is randomly selected rather than drawn from a pool of “friends”. TikTok generates a wider and more diverse audience than the traditional “follower”-based social media model (Ostrovsky & Chen, 2020). Finally, the *discussion arena* is composed of comments, likes and shared messages, i.e. of the audience's response.

There are many studies and evidence showing that Twitter and Instagram are the platform preferred by activists or social movements, acting as a real *collaborative-activist arena*. Li, M. et al. (2021), Reyes-Menendez et al. (2020). Xiong, Cho, & Boatwright (2019) analyse it as a tool for feminist social movements; Skill, Passero & Francisco (2021), Reyes-Menendez et al. (2018) and Carew (2014)

stress that Twitter is the platform where environmental activism materialises; Zoller & Casteel (2021) study a social media campaign of health activism in Twitter; Sinpeng (2021) describes young political activism, etc.; Yuen & Tang (2021) and Molder et al. (2021) analyse Instagram as an activist tool.

In recent years, a large number of publications on climate change focus on the study of the subject in relation to a specific event¹ and this is easy to understand since this perspective helps focus attention on specific moments with a high concentration of information flows that heighten the effect of the communicative phenomenon (Villagra et al., 2023). However, it is becoming increasingly necessary to also observe periods that are not directly related to major events, since there are serious differences in the intensity and direction of communicative cycles. Besides, biases can occur due to the specific topic of the event and the stakeholders involved. Moreover, many studies highlight the need to focus on longer timespans (e.g. Brossard et al., 2004; Nisbet & Huges, 2006; Shih et al., 2008).

Regarding the news and messages collection, in this article the authors decided to avoid moments which coincide with important events related to climate change (conferences, meetings, actions and protests, signing of agreements, etc.), with the aim to observe the communication flows in their natural state and not conditioned by the dynamics created by a specific situation. The study is part of a project that runs from 2021 to 2023 and includes several stages, however, the first collection of empirical material, which is the basis of this article, covers the period from 10 January 2022 to 10 February 2022. The coding and subsequent analysis of the results runs from March 2022 to January 2023.²

¹ The events that have traditionally escalated the media coverage of climate change coincide with events generated on the different agendas of the political, scientific and social spheres, in addition to extreme meteorological phenomena. The coverage of climate conferences stands out on the international political agenda. The international scientific agenda is the subject of media coverage with the presentation of successive scientific reports issued by the IPCC. Actions involving ecological activists stand out on social agenda, such as the arrest of Juan López de Uralde at the COP 15 climate conference held in Copenhagen in 2009. Other events that make the news are the frequent extreme meteorological phenomena, such as Hurricane Katrina. The presentation in 2015 of the Encyclical Letter *Laudato Si* by Pope Francis and the statement and actions by such leaders as Donald Trump also cause media coverage highs (Fernández-Reyes, 2018: 51).

² Due to the journal's rules, the name of the project and the titles of the rest of the articles published will not be shown in the review period.

2. Methodology

2.1. *Research technique and corpus*

The technique applied to obtain data is the content analysis in primary data sources: mainstream media (digital edition) and social media. This is a research method that provides an objective, systematic and quantitative description of the content of all units with a view to their interpretation (Berelson, 1952: 18), although this is not just limited to content but also considers the structure, since it addresses both the meanings and the significance of communication (Bardin, 1986, p. 29). Accordingly, the paper analyses communication in different online media and sources, considering the characteristics of each public arena.

The content analysis is a technique of a systematic, objective, and quantitative nature (Wimmer & Dominick, 2011), although, as indicated by Gaitán and Piñuel (1998), the distinction between quantitative and qualitative is weak, because qualitative aspects can be found in all research based on a theory to build the scientific aim of the study. Accordingly, in relation to the different public arenas a qualitative sampling of a strategic nature, as explained before, has been performed for the choice:

- *Mass media arena*: the online edition of the mainstream media.
- *Collaborative-activist arena*: Instagram and Twitter;
- *Personal arena*: TikTok
- *Discussion arena*: comments, likes and shared messages.

The monitoring period for this cross-cutting study was defined trying to avoid events on the political, scientific and social agenda that have traditionally conditioned the coverage of climate change issues. Since this is an exploratory study, a single line of enquiry was carried out, lasting for one month from 10 January 2022 to 10 February 2022 (see annex).

In the case of the online publications of the mainstream media (*mass media arena*), the keywords “young people” and “climate change” were used as search filters. The concept of climate change can also be referred to as the “climate crisis”, “climate emergency” and “global warming” (Ervíti-Ilundáin, 2020), and hence these terms were also used as synonyms³.

³ The company that provided the monitoring of the online media was Kantar Media.

To identify the publications on the *collaborative-activist arena*, Instagram and Twitter accounts for the main associations of young climate activists in Spain were monitored. The number of accounts monitored is as follows: 12 Twitter accounts: “Fridays for Future”-“JuventudxClima”, “Extinction Rebellion (XR)” and their local and regional accounts; 7 Instagram accounts: belonging to “XR” and “Fridays for Future”-“JuventudxClima”, and their local and regional accounts.

Similarly, the units of analysis corresponding to the *personal arena* correspond to publications in the accounts of young users of TikTok commenting on climate change, the climate crisis, climate emergency and global warming. The search begins with five main online environmental influencers and through their “followers” (young people under 30 who follow the influencer), a second account profile of an influencer was selected for each of these first five accounts. Then, after obtaining the five account profiles, another five are selected until the total number of profiles analysed is completed (the chain ends where the influencer accounts stop being of environmental content or are repeated).

Applying the foregoing criteria, 667 publications were obtained in the monitoring period, distributed as follows:

Online sources (mainstream media): A total of 768 publications on climate change were detected in the period, only 72 of which focused on the youth perspective.

Instagram: 31 publications.

TikTok: 388 publications.

Twitter: 176 publications.

This is a probe study, the results of which are not generalizable but descriptive – focusing on the description of certain dynamics.

2.2. Variables

The protocol of the analysis applied contains “formal variables” tied into the characteristics of the media and “content variables” obtained regardless of the media (Naccarato & Neuendorf, 1998). The formal variables are designed to identify the media and the name of the online sources in the case of the *mass media arena*, and the user’s account in the case of *personal and collaborative-activist arenas*. In the case of the mainstream media (online publications), a second variable is used that is codified *a posteriori* to identify the type of source (website

of the online media, website of an institution, website of a news agency or content aggregator). If the publication corresponds to social media, the name of the media platform is stated, and the name of the account or user is recorded.

The content variables are designed to record the presence or absence of the following thematic categories in the publication, which represent the different axes of environmental sustainability summarizing the Sustainable Development Goals of the 2030 Agenda⁴, and applied to the field of the media and communication.

Variable 1. Politics and climate change

Variable 2. Science and climate change

Variable 3. Economy and climate change

Variable 4. Culture and climate change⁵

Variable 5. Activism and climate change⁶

Variable 6. Social justice and climate change.

Numerical variables have also been used to measure and collect data relating to the engagement of the public in social media: These variables are:

- number of *likes*
- number of comments
- number of *retweets*
- number of visualisations.

The protocol has been applied systematically to the 667 publications. The data have been recorded in an Excel spreadsheet and then analysed using the programme *SPSS Statistics*. The protocol has been applied by six analysts, performing Krippendorff's (2013) Alfa test to measure the degree of inter-rater agreement or concordance, giving a result for the variable 1 and variable 2- 0.861; variable 3, variable 4, variable 5, variable 6 -1.

⁴ The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015: <https://www.undp.org/sustainable-development-goals>.

⁵ The concept of culture has been applied in its broad sense: culture and education, including the gender perspective.

⁶ Based on the SDGs n° 13: Climate Action.

2.3. Research questions

The cross-cutting nature of the climate crisis has turned ‘climate change’ into a habitual reference on the traditional and social media, either as a main issue or as a secondary issue in the context of the discourse of many other crises and eco-social problems. This cross-cutting nature of the climate crisis coexists with a digital, hyperconnected and multi-platform communication ecosystem, such that the communication of climate change takes place simultaneously on different public arenas which, in turn, interact with each other.

The specific research questions used in this article are as follows:

Q.1. Predominant thematic categories on the different public arenas where the young people are the generators of content (*collaborative-activist arena and personal arena*).

Q.2. Predominant thematic categories on the different public arenas where the young people are, in general, users of content (*mass media arena*).

Q.3. Level of interference between *discussion arena* and *mass media/ collaborative-activist* and *personal arena*.

3. Results and discussion.

According to the results, the predominant thematic categories on the *mass media arena*, even when it is a question of a discourse directed at a young public, is based on *hard topics*; that is, climate change is reflected through the binomial Politics-Climate Change.

According to the data obtained, the predominant topic in the online version of the mainstream media is *politics*, with 45.8%, followed by *science*, with 12.5%, and thirdly, *activism*, with 5.6%. As regards the topic of *politics*, it can be observed that it coincides with other reports issued and which detect the same trend (Teso & Lozano, 2022). With this variable we refer to the news or messages that address the issue of climate change and the SDGs from a political perspective: political speeches and debates, political positions, measures proposed by the political parties or by Governments, etc.

On the other hand, the *mass media arena* is where the fewest number of activism messages are posted. The variable *activism and climate change* refers to information about movements and associations in defence of the environment, protests, but also to individual initiatives (especially in the case of social networks).

media/platform

		Instagram	Traditional Media	Tiktok	Twitter	
Issue	Social justice and CC	Number	0	1	0	14
		% within media/platform	0.0%	1.4%	0.0%	8.0%
Activism and CC		Number	20	4	205	90
		% within media/platform	64.5%	5.6%	52.8%	51.1%
Activism+ social justice and CC		Number	1	1	0	12
		% within media/platform	3.2%	1.4%	0.0%	6.8%
Culture and CC		Number	0	3	47	2
		% within media/platform	0.0%	4.2%	12.1%	1.1%
Activism+ culture and CC		Number	1	0	7	1
		% within media/platform	3.2%	0.0%	1.8%	0.6%
Economy and CC		Number	0	1	0	2
		% within media/platform	0.0%	1.4%	0.0%	1.1%
Science and CC		Number	0	9	4	10
		% within media/platform	0.0%	12.5%	1.0%	5.7%
Science+ activism and CC		Number	1	0	9	6
		% within media/platform	3.2%	0.0%	2.3%	3.4%
Science+ activism+ social justice and CC		Number	2	0	0	0
		% within media/platform	6.5%	0.0%	0.0%	0.0%
Science+ economy and CC		Number	0	3	0	0
		% within media/platform	0.0%	4.2%	0.0%	0.0%
Politics and CC		Number	0	33	0	7
		% within media/platform	0.0%	45.8%	0.0%	4.0%
Politics+ social justice and CC		Number	0	2	0	1
		% within media/platform	0.0%	2.8%	0.0%	0.6%
Politics+ activism and CC		Number	1	1	0	3
		% within media/platform	3.2%	1.4%	0.0%	1.7%
Politics and science and y activism		Number	0	0	0	2
		% within media/platform	0.0%	0.0%	0.0%	1.1%
Not applicable/Did not answer		Number	5	8	116	24
		% within media/platform	16.1%	11.1%	29.9%	13.6%

Table 1. Content Variable-Media cross table. Source: Authors' own elaboration.
*CC: climate change.

Another result indicates that news based on scientific data and discourses are concentrated exclusively on the *mass media arena*. Both, on the *collaborative-activist arena* and the *personal arena*, the interest in these contents is very low. The situation is worse in the case of information approached from an economic-financial perspective (economic consequences of climate change, costs of the measures, sustainability). The *economy and climate change* variable doesn't reach 2% of the total content in any of the arenas. Otherwise, we observe that this percentage

improves when it comes to *social justice and climate change*, especially, because of the results of the *collaborative-activist arena*. This is mainly due to the mobilizing nature of messages focused on the social cost of the current situation or of the proposals for improvement, kind of information highly used in this arena.

Finally, we detected high levels of content related to climate change developed from a cultural perspective (*culture and climate change*) in the *personal arena*. This is mainly due to the large number of publications on TikTok about ecological, sustainable artistic products, many of them posted for commercial purposes.

After presenting the data obtained through the statistical study, we proceed to answer the research questions:

Q.1. Predominant thematic categories on the different public arenas where the young people are the generators of content (*collaborative-activist arena and personal arena*).

Q.2. Predominant thematic categories on the different public arenas where the young people are, in general, users of content (*mass media arena*).

If we examine the impact of the predominant thematic categories in the different public arenas where young people are the generators of content (*collaborative-activist arena and personal arena*), we find that the variable *activism* stands out from the rest (64.5% of posts on Instagram, 51.1% of tweets and 52.8% of content on TikTok). The following variables of interest, *culture and climate change*, *social justice and climate change*, represent a fifth of the total content generated (20.1%). Also, we can conclude that the interest in topics related to the political (4% on the *collaborative-activist arena* and 0% on the *personal arena*), economic (1,1% vs. 0%) or scientific (5,7% vs. 1%) perspective is extremely low both on the *collaborative-activist arena* and on the *personal arena*, but that this result improves slightly if the activism component is added: *science and activism* -6.6% of all the publications on the *collaborative-activist arena* and 2,3% on the *personal arena*; *politics and activism* - 4,9% vs. 0%.

Regarding the thematic categories on the arena where young people are, generally, content users (the *mass media arena*) we observe the predominance of two topics: *politics*, used in 33 % of cases, and *science*, in 12.5 % of cases.

From this result, we can deduce that there is a significant difference between, on the one hand, the topics generated by young people, and, on the other hand, those addressed to them as an audience. This situation may cause the disconnection of the young audiences from the mainstream media and professional journalism when seeking information on climate change.

The next issue we are looking at has to do with the level of engagement of the young audiences: Q.3. Level of interference between *discussion arena* and *mass media/ collaborative-activist* and *personal arena*.

Topic	Media/platform	Valid		Cases lost		Total	
		No.	Percentage	No.	Percentage	No.	Percentage
Social justice and CC	Twitter	14	100.0%	0	0.0%	14	100.0%
Activism and CC	Traditional Media	2	50.0%	2	50.0%	4	100.0%
	Twitter	90	100.0%	0	0.0%	90	100.0%
	Instagram	20	100.0%	0	0.0%	20	100.0%
	Tiktok	205	100.0%	0	0.0%	205	100.0%
Activism+ social justice and CC	Twitter	12	100.0%	0	0.0%	12	100.0%
	Instagram	1	100.0%	0	0.0%	1	100.0%
Culture and CC	Twitter	2	100.0%	0	0.0%	2	100.0%
	Tiktok	47	100.0%	0	0.0%	47	100.0%
Science and CC	Traditional Media	6	66.7%	3	33.3%	9	100.0%
	Twitter	10	100.0%	0	0.0%	10	100.0%
	Tiktok	4	100.0%	0	0.0%	4	100.0%
Science + activism and CC	Twitter	6	100.0%	0	0.0%	6	100.0%
	Tiktok	9	100.0%	0	0.0%	9	100.0%

Table 2. List of likes by topic. Source: Authors' own elaboration based on the data obtained in the study.

The result show that *activism* (climate action) turned out to be the topic that generates the highest level of response/engagement both on the *collaborative-activist arena* and on the *personal arena*. In the case of the *personal arena*, the variable *climate change and culture* also features highly.

It can be observed that the most active social media in terms of the number of likes and comments is TikTok, where *activism* is particularly represented, followed by Twitter and Instagram, which also feature highly on this topic. Finally, the *mass media arena* barely generates a direct reaction among the audience in terms of feedback.

Finally, we should mention that one of the problems faced by studies comparing information flows on different platforms has to do with the difference in the total number of units of analysis. For example, TikTok generates a large number of messages and interaction, while mainstream media are at the other extreme, due to the nature of the message and its uses by the audience. So, when it comes

to establishing comparisons, the quantitative differences can be affected, and this can hinder or even invalidate approaches that seek to monitor all platforms simultaneously. Even so, we must continue to carry out comparative studies on information flows on the different platforms, given that it is a viable way to obtain information about certain communicative dynamics in all their complexity and even more so, when the public under study is made up of young prosumers.

		Valid		Cases lost		Total	
		N	Percentage	N	Percentage	N	Percentage
Instagram	Activism	20	100.0%	0	0.0%	20	100.0%
	Activism and social	1	100.0%	0	0.0%	1	100.0%
	Science and activism	1	100.0%	0	0.0%	1	100.0%
Traditional Media	Activism	2	50.0%	2	50.0%	4	100.0%
	Culture	2	66.7%	1	33.3%	3	100.0%
	Science	7	77.8%	2	22.2%	9	100.0%
Tiktok	Activism	205	100.0%	0	0.0%	205	100.0%
	Science and activism	9	100.0%	0	0.0%	9	100.0%
	Culture	47	100.0%	0	0.0%	47	100.0%
	Science	4	100.0%	0	0.0%	4	100.0%
Twitter	Activism	90	100.0%	0	0.0%	90	100.0%
	Activism and social	12	100.0%	0	0.0%	12	100.0%
	Science and activism	6	100.0%	0	0.0%	6	100.0%
	Social	14	100.0%	0	0.0%	14	100.0%
	Culture	2	100.0%	0	0.0%	2	100.0%
	Science	10	100.0%	0	0.0%	10	100.0%

Table 3. List of comments by platform/media. Source: authors' own elaboration based on the data obtained in the study.

4. Conclusions

The study undertaken has allowed us to address the research questions proposed in this study and to provide a dynamic approach to analysis, since it focuses on the study of public arenas that allows us to see how a young audience receives and shares information in relation to climate change based on the SDGs in each of these forums for interaction.

This is an exploratory study where the spontaneous discourse on climate change produced by the mainstream media and the activists and users of the social networks was analysed. The monitoring period was chosen with a strategic

criterion in order to prevent that a specific event may condition the media and social agenda. Likewise, the accounts followed in social networks have a strategic value for this study, as they belong to the main climate activist groups. It is therefore a non-probabilistic and qualitative sample, so the results obtained are not statistically representative, although they offer valuable data to formulate future working hypotheses that should be contrasted with statistically representative samples of the different arenas.

From the results obtained in this study and similar to findings in other studies cited in our article, it is clear that the mainstream media (mass media) follow traditional patterns of news coverage, opting for *hard topics*, which translates into a large number of news stories from a political or economic perspective. It is obvious that traditional media pay less attention to environmental issues from the perspective of social justice, culture or activism, and this can be a problem when it comes to connecting with the young audience, which is very active and gives widely feedback for issues that have to do with these latter approaches and which are predominant on other arenas formed by social networks such as Instagram, Twitter, TikTok.

It is becoming increasingly evident that young audiences demand access to information where they have the opportunity to leave an opinion or simply show their attitude. Interaction with other users is essential.

It is important to underline that the proposed structuring of each of the arenas should not be seen as fixed and immovable. Without going any further, the changes that are coming to Twitter, according to some forecasts, may bring this platform closer to TikTok and turns out, among other things, in a decrease in its use for mobilisation or protest, a characteristic that has accompanied this platform since its creation.

On the one hand, professional journalism is not covering all the aspects of interest for the young audiences regarding the Sustainable and Development Goals and as a result, the youngsters migrate to other spaces in search of information that is closer to their reality. To correct this situation, all the aspects included in the 2030 Agenda must be covered: social justice, peace, reduced inequalities, gender, education, etc., and especially the climate action. Finally, it is necessary to mention the need to increase news of a scientific nature and look for tools to make them accessible to the audience; the same happens with questions that have to do with the economic and financial implications of the climate change.

It is important to highlight that, although the role of the media (mass media arena) can contribute to knowledge and the collaborative-activist arena and personal arena can foster debate and social mobilization, the achievement and implementation of the SDGs is a complex phenomenon that requires a global commitment at all levels and the collaboration between countries and all social actors: governments, regional and international organizations, multinational businesses and entrepreneurs (Reyes-Menendez et al., 2023) and individuals.

To achieve this, it is necessary to rethink the current economic and political models, for example, it is required to ensure an economic development that reduces social inequality and poverty (Mboumboue & Njomo, 2016) and gives a voice and greater importance to developing countries. Munamati et al. (2016) also point out the importance of investing in education that enables the acquisition of the competencies and technical skills necessary to implement the innovative initiatives that are needed. Governments, for their part, should promote policies that favor the achievement of the SDGs by identifying long-term goals instead of short-term policies focused on the mandate (Van Vuuren et al., 2014).

Caiado et al. (2018) discuss the difficulties of implementation of the sustainable development goals and suggest that addressing the challenges posed by the SDGs requires: 1) greater investments in education and information, 2) political leadership and governance, 3) global integrated compromise and partnership, 4) innovative solutions and 5) aggregated and reliable indicators, which can assess the relative contribution of each SDG and their interaction with each other.

These five measures require leadership and, at the same time, involvement and participation of citizens, especially youngsters. For instance, decarbonization of the economy is an essential aspect for achieving the SDGs and, however, it is an issue rarely addressed on social networks. In addition to the above, the results of the engagement analysis (table 2 and table 3) indicate that political and economic issues barely generate interaction with the audience despite their relevance. The measures taken by governments and institutions and the commitments to decarbonize the economy are matters of utmost interest for the future of young people and must be rigorously incorporated into the social debate.

In summary, it is necessary to develop research that analyzes this complex phenomenon from different perspectives and the role that media and social media can have in young audiences to contribute to an in-depth debate on these issues as well as social engagement and mobilization.

References

- Bardin. L. (1986) *El análisis de contenido*. Ed. Akal, Madrid.
- Berelson. B. (1952) *Content Analysis in Communication Research*. Glencoe. III.: The Free Press. <https://journals.sagepub.com/doi/10.1177/000271625228300135>
- Brossard. D., Shanahan. J. & McComas. K. (2004). Are issue-cycles culturally constructed? *Mass Communication and Society*, 7(3). 359-377.
- Caíado, R. G. G., Leal Filho, W., Quelhas, O. L. G., de Mattos Nascimento, D. L., & Ávila, L. V. (2018). A literature-based review on potentials and constraints in the implementation of the sustainable development goals. *Journal of Cleaner Production*, 198, 1276-1288. <https://doi.org/10.1016/j.jclepro.2018.07.102>
- Carew. J. (2014). Online Environmental Activism in South Africa: A Case Study of the #iam4rhinos Twitter Campaign. *Global Media Journal (African Edition)*, 8(2) 207–230.
- Downs. A. (1972). Up and down with ecology: the "issue-attention cycle". *Public Interés*, 28, 38-50.
- Erviti-Ilundáin. M. C. (2020). Del “cambio climático” a la “emergencia climática”: Análisis de El País y El Mundo. *Revista Prisma Social*, (31). 64–81. Retrieved from <https://revistaprismasocial.es/article/view/3866>
- Fernández. R. (2018). La comunicación del cambio climático en la prensa. Una mirada global en el contexto actual y evolución en los últimos años. In *Comunicación para la sostenibilidad: el cambio climático en los medios*, Teso. G.; Fernández Reyes. R. Gaitán. J.A., Lozano. C. & Piñuel. J. L., Fundación Alternativas. Nº: 1/2018. <https://www.fundacionalternativas.org/sostenibilidad/documentos/documentos-de-trabajo/comunicacion-para-la-sostenibilidad-el-cambio-climatico-en-los-medios>
- Gaitán J.A. & Piñuel J.L. (1998). *Técnicas de investigación en Comunicación Social*. Editorial Síntesis, Madrid.
- Geismar, H. & Knox, H. (eds.) (2021). *Digital Anthropology*. Second Edition. Routledge.
- Habermas. J. (1962). *Historia y crítica de la opinión pública. La transformación estructural de la vida pública*. Gustavo Gil, Barcelona.
- Habermas. J. (2010). *Teoría de la acción comunicativa*. Trotta, Madrid.
- Hilgartner. S. & Bosk. CH. L. (1988). The Rise and Fall of Social Problems: A Public Arenas Model. *American Journal of Sociology*, 1, 53-78.
- IAB Spain: Estudio de Redes Sociales 2021. <https://iabspain.es/estudio/estudio-de-redes-sociales-2021/>
- Krippendorff. K. (2013). *Content analysis: An introduction to its methodology*. 3rd edition. Sage, Thousand Oaks. CA.

- Li, M. et al. (2021). Twitter As a Tool for Social Movement: An Analysis of Feminist Activism on Social Media Communities. *Journal of Community Psychology*, 49(3), 854–868. <https://doi.org/10.1002/jcop.22324>
- Lörcher I. & Neverla, I. (2015). The Dynamics of Issue Attention in Online Communication on Climate Change. *Media and Communication*, 3(1), 17–33 <https://doi.org/10.17645/mac.v3i1.253>
- Mboumboue, E., & Njomo, D. (2016). Potential contribution of renewables to the improvement of living conditions of poor rural households in developing countries: Cameroon' s case study. *Renewable and Sustainable Energy Reviews*, 61, 266-279. <https://doi.org/10.1016/j.rser.2016.04.003>
- Miller, D. (2016). *Why we post: the comparative anthropology of social media*. In WebSci '16: Proceedings of the 8th ACM Conference on Web Science, 1-3. <https://doi.org/10.1145/2908131.2908132>
- Miller, D. (2021). The anthropology of social media. In Geismar, H. & Knox, H. (eds.), *Digital Anthropology* (pp. 85-100). Second Edition. Routledge.
- Molder, A. L. et al. (2021). Framing the Global Youth Climate Movement: A Qualitative Content Analysis of Greta Thunberg's Moral, Hopeful, and Motivational Framing on Instagram. *The International Journal of Press/ Politics*, (20211122). <https://doi.org/10.1177/19401612211055691> .
- Munamati, M., Nhapi, I., & Misi, S. (2016). Exploring the determinants of sanitation success in Sub-Saharan Africa. *Water Research*, 103, 435-443. <https://doi.org/10.1016/j.watres.2016.07.030>
- Naccarato, J. L. & Neuendorf, K. A. (1998). Content analysis as a predictive methodology: Recall, readership, and evaluations of business-to-business print advertising. *Journal of Advertising Research*, 38(3), 19–33.
- Newman, N., Fletcher, R., Schulz, A., Robertson, C, Eddy, K. & Kleis Nielsen R. (2022). *Digital News Report 2020*. Reuters Institute for the Study of Journalism. University of Oxford. https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2022-06/Digital_News-Report_2022.pdf
- Nisbet, M. C. & Huges, M. (2006). Attention cycles and frames in the plant biotechnology debate. *The Harvard International Journal of Press/ Politics*, 11(2). 3-40.
- ONU (2030) *Agenda for Sustainable Development* <https://sdgs.un.org/2030agenda>
- Ostrovsky, A. M. & Chen, J. R. (2020). “TikTok and Its Role in Covid-19 Information Propagation. *The Journal of adolescent health: official publication of the Society for Adolescent Medicine*, 67(5), 730–730. <https://doi.org/10.1016/j.jadohealth.2020.07.039>
- Peralta, L. & Peralta, T.O. (2015). El potencial educativo de las narrativas digitales en la comunicación para el cambio social. Jóvenes Frente al Cambio Climático como estudio de caso. *Obra Digital*, 8, 40-61. <https://doi.org/10.25029/od.2015.49.8>

- Reyes-Menendez, A., Saura, J. R. & Alvarez-Alonso, C. (2018). Understanding# World Environment Day user opinions in Twitter: A topic-based sentiment analysis approach. *International journal of environmental research and public health*, 15(11), 2537.
- Reyes-Menendez, A., Saura, J. R. & Thomas, S. B. (2020). Exploring key indicators of social identity in the# MeToo era: Using discourse analysis in UGC. *International Journal of Information Management*, 54, 102129.
- Reyes-Menendez, A., Clemente-Mediavilla, J., & Villagra, N. (2023). Understanding STI and SDG with artificial intelligence: A review and research agenda for entrepreneurial action. *Technological Forecasting and Social Change*, 196, 122785. <https://doi.org/10.1016/j.techfore.2023.122785>
- Rodrigo-Cano, D.; Mancinas- Chavez, R. & Fernández-Reyes, R. (Ed.) *La comunicación del cambio climático. una herramienta ante al gran desafío*. Dykinson. S. L., Madrid. 2021. ISBN 978-84-1377-643-9 Documento en red: <https://www.dykinson.com/libros/la-comunicacion-del-cambio-climatico-una-herramienta-ante-el-gran-desafio/9788413776439/>
- Schmidt, J.-H. (2013). Onlinebasierte Öffentlichkeiten. In *Online Diskurse*, Fraas, C., Meier, S. and C. Pentzold (Eds.), pp. 35-56, Herbert von Halem Verlag, Köln.
- Shih, T.-J., Wijaya, R. and Brossard, D. (2008). Media coverage of public health epidemics. *Mass Communication and Society*, 11(2), 141-160.
- Sinpeng, A. (2021). Hashtag Activism: Social Media and the #freeyouth Protests in Thailand. *Critical Asian Studies*, 53(2), pp. 192–205. <https://doi.org/10.1080/14672715.2021.1882866>
- Skill, K., Passero, S. & Francisco, M. (2021). Assembling Amazon Fires through English Hashtags. Materializing Environmental Activism Within Twitter Networks. *Computer Supported Cooperative Work (CSCW)*, 30(5-6), 715–732. <https://doi.org/10.1007/s10606-021-09403-6>
- Teso, G. (2021). Los movimientos sociales juveniles ante la emergencia climática y la comunicación del cambio climático en televisión. In *La comunicación del cambio climático. una herramienta ante al gran desafío*.
- Teso, G. & Lozano, A. C. (2022). La comunicación online del cambio climático en España. *RLCS. Revista latina de Comunicación Social*, 80, 65-87. <https://doi.org/10.4185/RLCS-2022-1531>
- van Vuuren, D. P., Kok, M., Lucas, P. L., Prins, A. G., Alkemade, R., van den Berg, M. & Stehfest, E. (2015). Pathways to achieve a set of ambitious global sustainability objectives by 2050: explorations using the IMAGE integrated assessment model. *Technological Forecasting and Social Change*, 98, 303-323. <https://doi.org/10.1016/j.techfore.2015.03.005>
- Villagra, N., Reyes-Menéndez, A., Clemente-Mediavilla, J., & Semova, D. J. (2023). Using algorithms to identify social activism and climate Skepticism in user-

generated content on Twitter. *Profesional de la Información*, 32(3), 1-17.
<https://doi.org/10.3145/epi.2023.may.15>

Wimmer. R. & Dominick. J. (2011). *Mass Media Research: An Introduction*. Ninth Edition, Wadsworth Cengage Learning, Boston, MA.

Xiong. Y., Cho. M. & Boatwright. B. (2019). Hashtag Activism and Message Frames among Social Movement Organizations: Semantic Network Analysis and Thematic Analysis of Twitter during the #metoo Movement. *Public Relations Review*, 45(1). pp. 10–23. <https://doi.org/10.1016/j.pubrev.2018.10.014>.

Yuen. S. & Tang. G. (2021). Instagram and Social Capital: Youth Activism in a Networked Movement. *Social Movement Studies*, 22 (2), 706-727.
<https://doi.org/10.1080/14742837.2021.2011189>

Zoller. H. M. & Casteel. D. (2021). #march for Our Lives: Health Activism. Diagnostic Framing. Gun Control. and the Gun Industry. *Health communication*, 37 (7), 813-823.
<https://doi.org/10.1080/10410236.2020.1871167> .

Supplementary Information

Annex 1: online source/account (social media) analysed

<https://ojs.unito.it/index.php/visions/article/view/8014/7400>

Authors

Dimitrina J. Semova (corresponding author), <https://orcid.org/0000-0001-8355-5121>

Complutense University, Madrid, Spain. djivkova@ucm.es

Gemma Teso Alonso <https://orcid.org/0000-0001-9852-0255>

Nuria Villagra García <https://orcid.org/0000-0002-2613-1530>

Jorge Clemente Mediavilla <https://orcid.org/0000-0002-9819-1129>

Alejandro Costa Escuredo <https://orcid.org/0000-0002-1424-364X>

Complutense University, Madrid, Spain.

Ana Reyes <https://orcid.org/0000-0003-0636-9573>

Rey Juan Carlos University, Madrid, Spain.

Funds

Green Activism Project KA2 -Agreement Number: 2021-1-ESO2-KA220 YOU-000029048. Erasmus+.

Competing Interests

The authors have no competing interests to declare. No potential conflict of interest was reported by the authors.

Citation

Semova, D.J., Alonso, G.T., Villagra García, N., Mediavilla, J.C., Escuredo, A.C., Reyes, A. (2023) Young audiences and climate change. Communication analysis in different public arenas. *Visions for Sustainability*, 21, 8014, 27-45.

<http://dx.doi.org/10.13135/2384-8677/8014>



© 2023 Semova, Alonso, Villagra García, Mediavilla, Escuredo, Reyes.

This is an open access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<http://creativecommons.org/licenses/by/4.0/>).