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**Huella digital proambiental: Explorando los usos pro ambientales de Instagram**

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## Summary

Climate change is a global issue that challenges all human beings to change the way they relate to the environment. This commitment is being widely adopted by the new generations, who suffer the consequences of the past and use their social networks to promote pro-environmental behaviors that mitigate the environmental impact of current lifestyles. Therefore, it is necessary to explore and understand through an interpretative qualitative methodology how Chilean adolescents use and give meaning to the social network Instagram in relation to the acquisition and dissemination of environmental information. Likewise, it is proposed to conceive the social network as a normative space rather than as an informative channel. To deepen this understanding, a digital participant ethnography was conducted.

The data constructed in the group interviews were analyzed from the Grounded theory approach and the ethnographic experience was analyzed from a multimodal approach oriented under the analysis of multimodal discourse. Both analyses were conducted in parallel and contributed to the understanding of the pro-environmental uses of Instagram. Results highlight the importance of environmental influencers in the generation of the environmental digital footprint, which is the body of information that allows users to awaken their interest in the subject and exercise new forms of pro-environmental civic participation.

**Keywords:** Instagram, Influencers, climate change, teens, digital footprint, pro-environmentalism, digital citizenship.

## **Introduction**

Climate change appears as the defining issue of our time, with a global impact of unprecedented scale (United Nations, 2015). This problem has been escalating over the years to the point of becoming today a serious and irreversible climate catastrophe, due to the 1.1°C increase in global temperature. The current situation implies a decreasing margin of maneuver to undertake drastic changes to avoid devastation, and evidences a failure of the policies for the decarbonization of the atmosphere agreed in the Paris Climate Agreement (IPCC, 2021).

The need to protect, conserve and restore the environment is shared globally. Vesely and Klockner (2018) suggest that, if this global commitment can be adopted and translated into local norms and individual actions, the behavioral change required today to mitigate the environmental impact of human action could be reached. To achieve this goal, the media plays a key role in the visibility of the problem, raising the levels of concern and consequently the generation of awareness and behavioral change.

Media such as radio, TV and print media have been losing prominence since the creation of social networks in the late 1990s, especially among younger generations who are skeptical of these media preferring alternative media such as social networks (Santana, 2016). The population aged 15 to 25 are three times more likely to access alternative information sources such as blogs, websites and social networks on climate change than those over 55 years old (Reuters Institute , 2020). Digital technologies can no longer be understood only as a resource for occasional use, but as part of the daily lives of children and adolescents (Fraillon, Ainley, Schulz, Duckworth, & Friedman, 2019)

Social networks have had an unprecedented influence on personal and professional life; they have impacted the way we communicate, keep in touch, share and acquire information (Zhu, Xu, Zhang, Chen, & Evans, 2020) and promote interaction, relationship building and social support among peers (Chau, Burgermaster, & Mamykina, 2018). Likewise, they allow to easily examine high flow of information that is updated daily, triggering social

comparison among its users (Yang & Robinson, 2018) and facilitating the internalization of social norms, since they involve simple, fast and quantifiable measures of approval and social support through "likes" (Cialdini, 2009).

It is because of the above that, social networks are already an important venue for information sharing, debate and opinion formation on a range of civic issues, including climate change (Williams, McMurray, Kurz, & Hugo Lambert, 2015 ). Understanding how climate change is presented and discussed online is rapidly becoming an area of critical importance.

Adolescents and emerging adults are particularly receptive to these new channels of information and engagement, showing high levels of smartphone and social media use. Most of them prioritize smartphones to search for information and communicate (Chau, Burgermaster & Mamykina, 2018). This ease of being aware of others, allows adolescents to feel part of a group as spectators, interacting with iconic communicative tools such as "likes" or written as comments (Gil-Quintana & Amoros, 2020), which function as a mechanism of social influence and a potential means by which individuals learn about their social environment (Sherman, Greenfield, Hernandez, & Dapretto, 2018). Thus, "likes" allow us to study the informative role of descriptive norms, in situations where there is little knowledge or an unclear stance. Interactions that were once qualitative are now also quantitative, Sherman, Payton, Hernandez, Greenfield, & Dapretto (2016) has conceptualized this social phenomenon as quantified social endorsement, a concept that describes the simple, quick and quantifiable measures of approval that are characteristic of social networks, such as likes, which offer an opportunity to make social approval visible.

It is of interest for the present research to contribute to the understanding of social influence in adolescents through social endorsement quantified on Instagram since it is the social network most used by Chilean adolescents (Painén, Ramírez, Alfaro, Melo Mariano, & Machorro, 2018).

The social influence by consumption of information on Instagram might be understood using Festinger's (1954) theory of social comparison of opinion, which focuses on identifying similarities and differences in thoughts, attitudes, values and beliefs. Social comparisons of opinion involve the comparison of one's own beliefs and preferences with

those of others (Suls, Martin, & Wheeler, 2000) and stem from a desire to learn about social norms, clarify or challenge one's own value system, and regulate behavior. In this case, individuals draw on the opinions of others to assess whether their own beliefs and preferences are accurate or socially acceptable, and as such, others are viewed as role models, consultants, and informants (Noon, 2020).

Adolescence, being a transitional stage characterized by the configuration of identity, becomes an ideal evolutionary moment for social comparison, due to the malleability of self-concept (Gibbons & Buunk, 1999). In particular, during this developmental stage adolescents search for external sources that help them to make self-definitions in relation to their own beliefs and validate whether their preferences are socially acceptable, which can help them in the configuration of their identity and adapt behaviors that allow them to fit into society (Noon, 2020). Thus, social comparison processes are recognized as fact- and norm-oriented behaviors, upon which individuals can position themselves and assume goals that they can use to explore new forms of behavior and generate identity commitments (Lee, 2014).

In accordance with the above, Instagram can be understood as a normative environment, since its characteristics offers the opportunity to examine social interaction (Sherman, Payton, Hernandez, Greenfield, & Dapretto, 2016), where participants create a digital identity that allows them to expose their interests to others, thus creating collaborative networks where they can consume, produce and/or interact with streams of information generated by other users (Sigerson & Cheng, 2018). For example, social networks make it easier for people to see the results of *pro-environmental behavior* such as the creation of community gardens or self-sustaining homes, thus motivating others to engage in pro-environmental behaviors (Mankoff, et al., 2010).

Social networks users have been classified by Yang and Robinson (2018) into three categories: interactive (produce and consume information directed to a specific audience), active (actively produce content without directing it to specific people) and passive (consume content). Seemingly, the uses of the internet according to Van Deursen and Van Dijk (2014) can be grouped into seven activities: personal development, leisure, online

shopping, social interaction, information acquisition, news and games. On the other hand, the DQ Institute (2021) proposes eight dimensions to understand the digital life of citizens, these are: digital identity, digital use, digital health, digital security, digital emotional intelligence, digital communication, digital literacy and digital rights.

This research explores the communicative uses proposed by the DQ institute (2021) and informative uses by Van Deursen and Van Dijk (2014), relating to the types of users by Yang and Robinson (2018) with the aim of understanding the meanings and types of informative and communicative use of the social network Instagram by Chilean teenagers on environmental issues, thus contributing to the understanding of new forms of pro-environmental civic participation in digital environments.

## **Method**

A cross-sectional qualitative methodology seemed to be the most appropriate to address the exploratory research question What meanings and uses do Chilean IEM adolescents give to the social network Instagram to inform themselves about climate change and share information about environmental care? This methodology, flexible and sensitive to people and contexts, is understood as a situated activity to observe the world, make it visible and transform it through a set of interpretative practices and data production devices that make it intelligible (Denzin & Lincoln, 2011).

Data was gathered through dialogue based on cognitive interaction (Gialdino, 2009). The interpersonal encounter that endows senses and meanings was crucial to explore and understand the purposes of use that Chilean adolescent give to the social network Instagram and whether they contemplate pro-environmental behaviors.

This perspective recognizes and validates how the position of the researcher can influence the research. Therefore, we sought to promote reflexivity from a conscious and deliberate effort to tune in to the participants' reactions and the way in which the research narrative is constructed (Berger, 2015).

This reflective attitude became more important because the researcher, in order to promote greater reflexivity, created a profile on Instagram to carry from a process of participant digital ethnography, which allowed him to interact with other users who see this space as an ideal environment for the dissemination of environmental information and the promotion of climate change awareness. Likewise, with the intention of contrasting and complementing the information obtained during the ethnographic process, group interviews were conducted in order to enrich the information and identify the uses and meanings that teenagers give to Instagram and if they contemplate pro-environmental uses in their profiles.

The analytical plan contemplated two independent strategies that sought to understand the complexity of the phenomenon studied in a comprehensive manner; group interviews that were analyzed under the open coding paradigm proposed by grounded theory (Strauss & Corbin, 2002), and a digital participant ethnography analyzed through multimodal

discourse analysis (Cárcamo Morales, 2018). It should be clarified that the open coding process, once the emerging categories were identified, was analyzed under the light of existing theories and frameworks that enriched and gave meaning to the ethnographic process carried out in Instagram.

### **Participants**

A purposive and voluntary convenience sampling was carried out in schools participating in the PROSA research project in two regions of Chile, RM and Los Ríos. In these establishments, students between 14 and 16 years old who had an active Instagram account and had written authorization from their parents or guardians were invited to participate. The invitation was carried out through awareness campaigns about the environmental challenges facing Chile those interested registered through a google form and were then contacted by the researcher in charge. The final sample consisted of 13 participants, 10 females and 3 males, 8 from the RM and 5 from the rural municipality of Panguipulli, Los Rios region. Regarding their experience on Instagram, their membership ranged from 2 to 6 years (average 4 years); most participants declared having their profile public, only 4 claimed to have it private and only one participant claimed not to follow accounts that share environmental information. 6 reported sharing environmental information; however, none created pro-environmental content. As for signing an online environmental petition, 5 claimed to have done so at least once.

### **Techniques**

The data were collected through two techniques, on the one hand, the profile @Prosa.UC was created to carry out the digital participant ethnography for 10 months on Instagram. During this period, 18 posts were made as a means to mark presence in the field of study and thus facilitate the experience of establishing connections with other users. As a complementary technique, group interviews were conducted, a technique used with the purpose of gathering Chilean teenagers active on Instagram, to talk informally about the purposes of using Instagram, influencers, climate change and the actions we can take to promote environmental care both online and offline, thus contributing to the understanding



of how much and how teenagers use Instagram to get information about the environment and communicate pro-environmental information. A qualitative methodology was used that allowed the construction of knowledge that occurs on the basis of concepts. It is the concepts that allow us to reduce complexity.

### **Participant digital ethnography**

Digital ethnography understands the Internet as a context where practice, meanings and cultural identities mingle through diverse pathways (Domínguez, et al., 2007). The above, enables the integration of methodologies that respond to the complexity of digital environments, characterized by multi sites, multi levels and multi platforms (Bárcenas s & Preza, 2019).

In digital environments as is the case of Instagram, the ethnographic method has positioned itself as an important methodological option for the production of categories and data that allow explaining other ways of being together through technological mediations. It enables a reflection on the social background of the Internet and on the dialogue of experiences and social interactions that occur there (Domínguez, et al., 2007).

Digital ethnography promotes the need to consider the theory of practice as a bridge between theoretical conceptualization and empirical data, and implies a back-and-forth process of social practices and the production of meanings through a technological mediation (Bárcenas s & Preza, 2019). It is in this mediated interaction that the description and interpretation of digital multimodal discourse practices developed in everyday life contexts and for everyday purposes makes sense (Pérez & Cassany, 2018).

In digital environments, the creation of an identity is essential to generate trust in other users (Bárcenas s & Preza, 2019). It is from the digital identity that the recognition of shared interests occurs and subsequently collaborative actions are generated in order to achieve common goals. Based on the above, the profile @Prosa.UC was created to carry out the participant digital ethnography for 10 months. During this period 18 posts were

made as a means of marking presence in the field of study and thus facilitating the experience of establishing connections with other users.

A post on Instagram, is basically every message that the user publishes on their account with the objective of generating engagement with the public. They are usually accompanied by some message or by a hashtag (#) that contributes to the construction of the online identity (Deditius, 2020). This paper conceives the nature of online language as essentially persuasive.

The field of study was composed of a total of 252 profiles of both national and international governmental organizations and NGOs, influencers, social leaders and users interested in environmental protection and connection with nature. At the beginning, priority was given to profiles that promoted hopeful attitudes towards the environmental struggle; however, in the focus groups, participants considered that the posts that promoted terror were the ones that most sensitized people, so they began to follow this type of accounts. On the other hand, there were 198 followers, mostly students belonging to the educational institutions where the invitation to participate in the research was made.

During the observation period, a field diary was used to reflexively record how the research field was being constructed, paying more attention to the interactive processes among users, the information and communication processes, the new forms of socialization and the construction of sense and meaning around the actions that accounted for the pro-environmental uses those other users made of Instagram.

Another recording strategy was the "save" and "archive" option made possible by the Instagram interface, option that allows a record to be made of the "likes", the publications shared in the stories and the stored posts.

The information constructed during the participant ethnographic process, a total of 90 posts, was initially grouped into 16 categories according to the pro-environmental practices identified in the informative uses made by the focus group participants. After identifying the categories, a rubric was created to select the posts that best represented each one. In order to reduce bias, the selection was made collectively with 5 other members of the research team. In the group discussion process, the emerging categories were redefined into

a total of 13 categories. The regrouping sought to identify posts that would best persuade users to take both environmental awareness and action for the environment.

The methodological procedure for identifying the posts that best represented the categories was operationalized based on three criteria: 1) modality (what systems are involved in the post?), 2) function (what is the post used for?) and 3) composition (what is the post made up of?) (Cárcamo Morales, 2018).

Total of 18 messages were analyzed and grouped into informative actions and communicative actions, highlighting the categories of pro-environmental digital activism and promotion of sustainable habits for being the most persuasive intention towards other users:

***Information actions:*** Energy saving (1), consumption awareness (1), environmental training (1), impact of industries (1), climate change information (1), Chilean environmental policies (1), and technology and innovative (1).

***Communicative actions:*** Promotion of sustainable habits (3), waste management (1), water management (1), ecosystem protection (1), green mobility (1), pro-environmental digital activism (3).

### **Analytical strategy: Multimodal Discourse Analysis**

The purpose of social media communication is to capture and fix the user's attention. In digital environments, the sender has to achieve the reliability of the receiver, making him/her aware of the subject matter thanks to the brief and concise communication shared by him/her. The discourse of this type of text emphasizes the visual mode to attract the attention of receivers, but at the same time combines such visual elements with verbal ones (Ayala, 2018).

Another characteristic of these spaces is that the topics disseminated are closely related to social and individual life. In the case of the present research with a global problem, climate change, which demands specific attitudes and behaviors required to intervene it (Deditius, 2020). To achieve this, the interface has visual supports, graphic effects such as emoticons

and the possibility of using hyperlinks such as hashtags that make the connection with the information of other users and offer the possibility of intertextuality.

It is because of the above characteristics that a broad view of the object of study was required by considering not only language as a unit of analysis, but also images, gestures, actions and sounds in their combination (O'Halloran, 2012). This gives rise to semantic expansions grouped into four semiotic systems (verbal, graphic, mathematical and typographic) through which the potential meaning of language can be understood (Cárcamo Morales, 2018).

The elements that form the post/text must be complementary; in other words, everything contributes to the creation of the meaning of the text and influences the reader in a clear and direct way. The elements cannot be conceived as independent units, but must behave and be read as a whole within the text they configure (Ayala, 2018).

In the present research we approach the analysis of multimodal discourse using the systematic functional linguistics (SFL) of Martinec and Salway (2005), who propose an analysis that aims to determine the compositional cohesion between the semiotic resources used based on the ideational metafunction systems. This considers both the transitivity system and the causal combination system (syntax and logical-semantic relations), which are associated with the relations between text and image in three categories:

**Anchoring:** the text allows to elucidate the image (e.g., captions).

**Illustration:** the image clarifies the text (for example, the photo accompanying a news item).

**Relay:** both text and image are on the same level (e.g., movies or comic strips).

## **Groups interviews**

Being an exploratory study, it sought to broadly and descriptively cover two categories of analysis, the uses and meanings attributed to the social network Instagram by Chilean adolescents. It was intended through directed questions if the uses included pro-environmental actions and if they understood Instagram as a space conducive to the promotion of pro-environmental behaviors and the generation of environmental awareness.

Four groups' interviews were conducted between January 25 and June 19, 2021. Regarding the ethical conditions, the study had the approval of the ethics committee of the Pontificia Universidad Católica de Chile, both consent and assent were collected using the Google forms application. Participation in the study was voluntary, the confidentiality of the information and the anonymity of the participants was safeguarded, and there was no financial remuneration of any kind, nor was there feedback on the results obtained.

The meeting spaces were carried out by Zoom with an average duration of 60 minutes, to protect the privacy of the participants the meeting contemplated only the use of the microphone, which implied losing the richness of non-verbal language. Likewise, the possibilities of the zoom interface limited the deliberate discussion of participants, since they had to speak in turns, otherwise the clarity of the discourse was lost.

The main questions that guided the group interviews were:

- What motivated them to join Instagram?
- What kinds of things do they review and post - can you give me an example?
- What do they feel using Instagram provides them?
- What kind of people do they follow on Instagram?
- How does following those people/influencers help or benefit them?
- Do they follow topics, people or news related to climate change? How does it help or hurt them?
- Are they concerned about the consequences of climate change?

- Do they take action to reduce the effects of climate change?

### **Analytical strategy: Grounded Theory**

Data was analyzed following Grounded Theory procedures (Strauss & Corbin, 2002), which has a guide to conceptualize the data and elaborate categories through the coding paradigm that serves to explain the construction of the theoretical framework necessary for the development of empirically grounded concepts (Kelle, 2005). The information gathered during the groups interviews was first organized using the ATLAS.ti software.

It focused on two broad and descriptive categories of analysis: the uses and meanings attributed to the social network Instagram by Chilean adolescents. The open coding analyses identified four subcategories of analysis. In relation to uses, information consumption and communicative uses were identified; in relation to meanings, the contributions of Instagram, influencers, beliefs about climate change and the contributions of Instagram to the generation of pro-environmental behaviors were determined. These subcategories were analyzed under existing theories because a deeper understanding of the ethnographic process was sought.

To understand the informative uses of Instagram of the participants, the uses of the internet proposed by Van Deursen & Van Dijk (2014) were followed, especially the one referred to the acquisition of information, which is typified as a passive use, the sources from which the participants are informed are traditional media, independent media, influencers, friends, academics and scientists. Another discussion around the acquisition of environmental information was the type of content and the impact it has on readers.

As for the category of communicative uses, the framework proposed by DQ institute (2021) is used because it offers eight areas of analyzing of digital life, the communicative uses have been typified as active and interactive and are characterized by the presence that the user generates in digital environments.

The areas of digital life are: digital identity, digital use, digital rights, digital literacy, digital communication, digital emotional intelligence, digital protection, digital security. The communicative uses have been typified as active and interactive and are characterized by the presence that the user generates in digital environments.

## **Results**

The results obtained both in the process of participating digital ethnography and in the group interviews are presented below.

The first part describes the characteristics of digital communication and the record that it leaves related to digital environments, to later emphasize the pro-environmental record identified during the 10 months of participant digital ethnography.

Regarding the results of the group interviews, the following results show the informative and communicative uses of pro-environmental type declared by the participants

### **Digital footprint**

Digital communication generates a permanent record and trace on the internet, this repertoire of digital content has been referred to as a digital footprint (Boudlaie, Nargesian, Nik, & Keshavarz, 2019).

The interviewed participants create a digital footprint related to their individual identity by producing personal content related to memes, drawings, and selfies. Different from users who promote environmental awareness, participants limit themselves to consuming environmental information created by "the environmental digital footprint" of the scientists and environmentalist influencers/social leaders they follow.

It is from the "environmental digital footprint" created by Instagram users that it was possible to identify the new forms of environmental civic participation and select the corpus of analysis product of the participating digital ethnography. 18 publications, whose objective was to identify how environmental issues are reported and communicated on Instagram.

Of the 18 selected publications, 11 correspond to informative intentions with the purpose for users to learn about an event they are unaware of or an event that is happening, thus increasing the knowledge they have about it. It does not seek to generate interaction with the audience but only to update it, which denotes a passive role.

For reasons of length, only the posts that best represent the informative intent are included below.

**Picture 1**

**Environmental training: text subordinate to image (illustration): projection**



The informative act is subordinated to the image, where the text only emphasizes the importance of reducing, a word that is linked to a # giving it a greater visualization in searches related to the highlighted action, in this case reducing. The image shows a value message "the best option is" that reinforces the persuasive intention that is graphically demonstrated between recycling, reusing and reducing; this is what gives it the projective



character and is informative because it does not promote interaction, it only transmits a formative message in an illustrative way.

## Picture 2

Promotion of government habits: complementary type (anchoring): expansion of elaboration type.



The informative act is of an expansive type because it combines the use of text and image to promote the adoption of sustainable habits through the celebration of Earth Day. This post in its description also contemplates the use of #Horadelplaneta to promote the commitment to turn off the lights at home for an hour, which is why it is called an anchor act because the text and image are subordinated to a specific intention that seeks the greatest expansion of the message.

### Picture 3

#### Technology and innovation: complement type (illustration): Extension of the improvement type



The informative act is of the commentary type because the text only seeks to complement the information provided visually. Here it also seeks to expand an action but visualization tools such as the # are not contemplated, nor is a description of the post, its intention is not to persuade users to perform the action, it only informs the procedures to achieve an objective.

As for the communicative uses, 7 are identified, the purpose here is focused on providing knowledge on a topic or event where expectations are created and demands are made, it is of a dialogic nature and questions the user, inviting him/her to an interactive role.

For reasons of length, the posts that best represent the communicative intent are attached.

Picture 4

## Habit promotion: complementary type (illustration): Enhancement type of extension



This post is the one that best represents the communicative act because it complements the image with persuasive questions that challenge users regarding their daily actions, which generates a greater identification of the user with the situation, capturing their attention and encouraging their interaction with the publication. Likewise, the images illustrate the problem and the text of the description extends and enhances the message, adding more precision to the message, always from a questioning act. “¿Y ustedes, ecomaniacos? ¿Por dónde empezaron? ¿Qué le dirían a alguien que quiere empezar a ser más eco? ¡Los leo!”. The post is accompanied by several #'s, most of them alluding to plastic reduction and waste management.

Picture 5

Environmental formation decision tree: imagen subordinate to text (illustration): Extension of type enhancement



The communicative intention in this post is oriented towards making users aware of the positive and negative impacts of waste management, the image is subordinated to the text since its role is exemplifying, being the image the one that illustrates the consequences of the actions. The description uses emoticons to reinforce the persuasive intention, which is accompanied by the following questions: “¿Qué opinas? ¿De qué otras maneras podemos evitar que el plástico termine afectando los ecosistemas?”, here we also visualize the use of the # related to slogans such as recycle, reduce, climate change.

## **Pro-environmental uses and meanings of Instagram by Chilean teenagers**

The informational and communicative uses identified during the ethnographic process and analysis are consistent with the purposes of Instagram uses by Chilean adolescents

### ***Pro-environmental informational uses of Instagram:***

In terms of informative uses, the declared sources from which the participants are informed are: traditional media, independent media, influencers, their friends, academics/professionals and scientists; not all of them provide environmental information.

Of the users they follow, they consume environmental information from those of scientists who disseminate their research; an example in this category is David Attenborough, who uses instagram to socialize with users his findings on the causes and effects of climate change.

On the other hand, they also consume environmental information from influencers. To this group, participants classify them into different categories: (a) "lifestyle promoters" that although they may invite their followers to consume organic products or use the bicycle, their goal is not to promote care for the environment but a healthy life; (b) "merchants" here there is a wide range of products some of them are with recycled material or used clothes as ways to avoid flash fashion (seasonal clothing of low quality) ; (c) "fame seekers" they are only interested in having many followers, they speak for their own benefit and usually create funny or polemic content; and (d) "leaders of a change" they mobilize from the word informing about what is happening and contributing with points of view in favor of social changes.

They recognize that influencers who promote social change bring them points of view and new ideas about feminism, multiculturalism and environmentalism. They also see them as examples to follow and highlight the contribution that their content makes to be informed.

The environmental influencer they recognize the most is Greta Thunberg, stating that "Her content (posts) keeps me informed about climate change (P3, 14years old)", "Her phrases

inspire me and invite me to be like her (p10, 14 years old)" and "she is the promoter of the Friday for future marches, in my high school they once organized one in which I participated (p7, 16 years old)". In general, they consider that their contribution is to "engage people, companies and governments in working for the care of the environment (p2, 15 years old)".

Another discussion around the acquisition of environmental information was the type of content and the impact it has on users. Most of the participants consider that "horror" publications, i.e., those showing fires, extinct animals or highly polluted places are the ones that most involve people with environmental care. "It is necessary to generate terror so that people become aware, only then will they start doing things (p8, 14 years old)". For the participants, people tend to be more sensitive to change their behaviors when they identify high levels of destruction, so, "It is important to show what the reality of the problem is (p9, 16 years old)".

Only for two of the thirteen participants, it is more important to consume "hopeful" information because "it gives people like saying you can still change something, that it is possible, without that sense of still being able to deal with the problem people could fall into disinterest (p1, 14 years old)".

### ***Pro-environmental communicative uses of Instagram:***

From the areas of digital life proposed by DQ, pro-environmental uses by Chilean teenagers are identified in two areas, digital emotional intelligence of self-awareness and management, since the participants recognize the influence of personal values and beliefs conveyed by influencers on sensitive issues such as climate change and the protection of ecosystems.

The other area is digital communication where the interest in communicating and collaborating with others in the dissemination of feminist issues, veganism and environmentalism is evident. Although the participants do not create environmental content, they do not make an active or interactive pro-environmental use of their Instagram, most of them recognize the contributions of creating and sharing environmental information on Instagram. Their reflections regarding the contribution point to "showing

people what is happening with global warming and informing them (p4, 15 years old)", "The information shared has helped people to change their unsustainable lifestyles (p11, 14 years old)", "motivating people to take care of the planet through publications or campaigns (p2, 15 years old)" and "Maintaining the fighting spirit in the younger generations for a fairer world (p7, 16 years old)". However, some participants consider that Instagram does not contribute to the fight against climate change "People question when one uploads images raising awareness about climate change, so I deleted the publication and did not upload anything again (p4, 15 years old)", "maybe it serves to raise awareness but not for people to change their actions (p12, 14 years old)", "people show themselves very different in their social networks to how they really are, they may publish things about the environment but they do not apply them (p13, 15 years old)".

## **Discussion**

The present study explored the pro-environmental uses of Instagram through the process of participant digital ethnography and contrasted them with the uses and meanings of Instagram by Chilean adolescents. The following are some conclusions that may lead to future research that seeks to understand Instagram as a normative environment conducive to new forms of civic participation rather than as an information and communication tool.

For the participants, the contributions of Instagram are related to the possibility of being informed about current issues of both the country and their friends; likewise, they see it as a recreational space where they can access memes or groups where video games or series are discussed. These results are in line with the types of use that have been widely identified by studies such as the global kids online (2021).

### **Purposes of academic uses:**

A novel finding regarding the purposes of academic uses of Instagram is that participants see in this space the possibility of learning about the profession they wish to study by following accounts of professionals who illustrate what it is like to be and work as a doctor, psychologist or artist. This broadens the academic uses beyond acquiring information for school assignments.

This search for social referents shows Instagram as a space not only informative but also normative where users identify referents that guide the construction of their identity. In relation to this emerging issue, future studies could delve deeper into the role that the uses of Instagram can play in the vocational accompaniment of adolescents.

### **Purposes of relational uses:**

Another theme that emerges in the present study refers to the communicative purposes of use in favor of the development of socioemotional skills through the use of Instagram. It is relevant to point out that the research was carried out in a period characterized by social distancing as a result of the covid-19 pandemic with participants who, due to their age, were in a time of school transition (most of them were in first grade, which in many cases implied starting a new school), characterized by the virtuality that made it difficult to recognize and connect with classmates. Faced with this scenario, Instagram was used as a means to meet their new classmates ("I created Instagram to meet people and be more social, P4, 15 years old)", keep in touch with them ("I started using Instagram to be able to talk to my classmates, P13, 14 years old)" and feel accompanied in moments of social isolation ("I use Instagram to know about my friends because, although I do not talk to them, seeing their stories makes me feel that they are there, P6, 15 years old)". Going deeper into this finding in future research would contribute to understanding the benefits and opportunities that the use of Instagram has for the development of social-emotional skills in adolescents.

### **Purposes of pro-environmental uses:**

A predominantly passive use is identified by the participants, who state that they use Instagram to inform themselves about the environment but do not perform any communicative action regarding the promotion of care for the environment, i.e. they do not contribute to the generation of a "pro-environmental digital footprint". Here it is important to highlight that the acquisition of environmental information is more related to individuals than to organizations or traditional media. This difference marks new ways not only to be informed but also to participate and commit to social causes promoted by users who see in these digital environments public spaces to denounce, promote and act civically changing the dynamics of power in the public sphere (Evans, 2017).



This has been conceptualized as an "updated-collaborative" citizen who is characterized by a tendency to distrust traditional media, prioritizing multiple alternative sources of information and favoring community action connections, usually established or sustained through the Internet and social networks. These conditions allow the individuals themselves to decide in what kind of actions and in what terms they are going to get involved in the public sphere (Santana, 2016).

Community action connections in digital environments facilitate enhancing the capabilities of adolescents to achieve their personal goals through collective activities (Consalvo & Ess, 2011). In the present study this process is clearer in feminist than environmentalist actions, which can trigger behaviors that have been characterized as digital activism, that is, ways in which citizens use digital technologies to influence social and political change (Lozano & Fernández, 2020). This is typical of young citizens, whose participation is rooted in the everyday, culturally relevant to them, and whose organization and action are community-based (Vromen & Collin, 2010).

Influencers are the ones who, by personifying a cause, not only sensitize and raise awareness, but also inspire adolescents to the point that they take a stance, adopt their values and pro-environmental beliefs.

Sharing common values and interests identified through the digital socioemotional skill of self-awareness and management allows them to develop a sense of belonging that translates into reflections that seek to defend certain lifestyles that are more environmentally friendly. Reflections that can trigger initiatives such as "participating in marches for the environment (P7, 16 years), "reducing the consumption of meat and industrialized products (P4, 15 years), "buying second-hand clothes (P2, 15 years) and "raising money for environmental causes (p13, 14 years)".

It is from the sense of belonging that begins the opinion comparison behavior focused on identifying similarities and differences in thoughts, attitudes, values and beliefs. Most participants who follow an environmental influencer tend to question their own value system and undertake a more reflective attitude towards regulating their environmental behavior ("Her (Greta Thunberg) phrases inspire me and invite me to do like her, p10, 14 years old").

It is for this reason that the creation of a digital identity on Instagram that reflects the thoughts, attitudes, values and beliefs held regarding a particular topic becomes relevant. This precondition for collaborative actions was identified in the digital ethnography process, where engaging in dialogue with other users was conditioned by the number of publications (pro-environmental digital footprint); the more publications, the greater the trust and willingness of other users to share ideas on the pro-environmental use of Instagram.

The above contributes to the social identity theory and self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), which provide an explanation of when and how people become members of a group and at what levels they categorize themselves.

Digital identity therefore does not focus on personal identity, but on the perception of oneself in a social category and the feeling of subjective similarity to this same category where group-specific characteristics dominate the expression of the self (Merle, Gerhard, & Drews, 2019).

### **Limitations and suggestions for future research:**

The main limitation of the study is the size of the sample and its low sociodemographic representation. It is suggested to have a larger number of participants which are balanced both by sex and socioeconomic level. Conditions that could not be guaranteed in the present investigation due to the difficulties presented by the covid-19 pandemic to access the sample.

It is proposed for future research related to the pro-environmental digital footprint, to investigate in greater depth the characteristics of pro-environmental digital activism and the pro-environmental educational uses of Instagram, this last topic arises as a subject of interest when identifying several pro-environmental profiles on Instagram that were created to disseminate pro-environmental school projects.

### **Conclusion**

The concept proposed is the pro-environmental digital footprint, a record that is built by different users among them influencers, academics and scientists who disseminate their research or personal opinions in multimodal languages that are more accessible and attractive to adolescents.

Environmental organizations, both governmental and NGOs, in their digitalization process also contribute to the pro-environmental digital footprint, as they use these spaces to continue promoting awareness and changing behaviors to more environmentally sustainable ones, as is the case of Greenpeace and the Ministry of the Environment of Chile. Similarly, traditional and independent media in their multiplatform format contribute by disseminating news about environmental catastrophes such as the fires in Australia or the Amazon, content that has a great impact on users and makes them aware of the importance of protecting ecosystems.

The pro-environmental digital footprint is the result of new forms of participation in digital environments, being this communicative act an exercise of digital citizenship with pro-environmental purposes through environmental digital activism promoted by social leaders such as Gretha Thunberg, whose purpose according to the participants is "to generate awareness (p12, 14 years old)" and "to maintain the fighting spirit in young generations for a fairer world (p7, 16 years old)". This permanent record makes it possible for users, in their searches for environmental information through Instagram, to access content promoted by influencers recognized as promoters of social change and possibly adopt a behavior of social comparison of opinion that leads to the adoption of environmental values, beliefs, attitudes or behaviors; The posting of personal opinions is associated with a desire for social change (Merle, Gerhard, & Drews, 2019). Therefore, social networks are becoming a more important source for the exploration of language use and intentional behavior hence the importance of understanding these digital environments as normative spaces.

These findings contribute to research in social psychology especially the social identity model of pro-environmental action (Fritzsche, Barth, Jugert, Masson, & Reese, 2018), a theory that has shown that social networks help individuals communicate, voice protests, inform the public, and form common collective identities contributing to a sense of

collective efficacy which in turn fosters pro-environmental action (ALLAGUI & KUEBLER, 2011). Therefore, social media are becoming a more important source for the exploration of language use and intentional behavior hence the importance of deepening their understanding as normative environments.

## Referencias

- ALLAGUI, I., & KUEBLER, J. (2011). The Arab Spring and the Role of ICTs| Introduction. . *International Journal of Communication*, 1435–1442.
- Ayala, T. (2018). Del texto al hipertexto, del discurso al discurso multimodal: una mirada desde la cibercultura | Contextos: Estudios de Humanidades y Ciencias Sociales. *Contextos: Estudios de humanidades y ciencias sociales.*, 1- 25.
- Berger, R. (2015). Now I see it, now I don't: researcher's position and reflexivity in qualitative research. *Qualitative Research*, 15(2) 219–234.
- Boudlaie, H., Nargesian, A., Nik, B., & Keshavarz. (2019). Digital footprint in Web 3.0: Social Media Usage in Recruitment. *AD-minister N.º.34*, 131 - 148.
- Cárcamo Morales, B. (2018). El análisis del discurso multimodal: una comparación de propuestas metodológicas. *Forma y Función*, 145-173.
- Chau, M. M., Burgermaster, M., & Mamykina, L. (2018). The use of social media in nutrition interventions for adolescents and young adults—A systematic review. *International Journal of Medical Informatics*, 77-91.
- Cialdini, R. B. (2009). *nfluence: Science and practice*. Boston: MA: Pearson Education.
- Consalvo, M., & Ess, C. (2011). *The handbook of Internet studies*. Malden, MA: : Wiley-Blackwell.
- Deditius, S. (2020). #Protecttheoceans. Linguistic mechanisms of argumentation used in Instagram. *Linguistica Silesiana*, 67-83.
- Denzin, & Lincoln. (2011). *Qualitative research*. Los Angeles: SAGE.
- DQ institute . (25 de Septiembre de 2021). *DQ institute*. Obtenido de DQ institute : <https://www.dqinstitute.org/global-standards/#contentblock1>
- Evans, S. y. (2017). “Explicating affordances: A conceptual framework for understanding affordances in communication research”. *Journal of Computer-Mediated Communication* 22(1).
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117-140.
- Fraillon, J., Ainley, J., Schulz, W., Duckworth, D., & Friedman, T. (2019). *IEA International Computer and Information Literacy Study 2018 Assessment Framework*. Camberwell: Springer.
- Fritsche, I., Barth, M., Jugert, P., Masson, T., & Reese, G. (2018). A Social Identity Model of Pro-Environmental Action (SIMPEA). *Psychological Review*, 125(2), 245-269.
- Gialdino, I. V. (2009). Los fundamentos ontológicos y epistemológicos de la investigación cualitativa. *FORUM: QUALITATIVE SOCIAL RESEARCH*, 30.
- Gibbons, F. X., & Buunk, B. P. (1999). Individual differences in social, comparison: development and validation of a measure of comparison orientation. *Journal of Personality and Social Psychology*, 129-142.

- Gil-Quintana, J., & Amoros, M. F. (2020). Posts, interactions, truths and lies of Spanish adolescents on Instagram. *Texto Livre*, 20-44.
- Global kids online . (25 de Septiembre de 2021). *global kids online* . Obtenido de global kids online : <http://globalkidsonline.net/results/>
- IPCC. (2021). *The Intergovernmental Panel on Climate Change*. Ginebra : IPCC.
- Kelle, U. (2005). ¿Hacer "emerger" o "forzar" los datos empíricos? Un problema crucial de la teoría fundamentada reconsiderada. . *FORUM: QUALITATIVE SOCIAL RESEARCH*, Volumen 6, No. 2, Art. 27.
- Lee, S. Y. (2014). How do people compare themselves with others on social network sites?: The case of Facebook. *Computers in Human Behavior*, 253-260.
- Lima, M. L., & Branco, C. (2020). Recycling for my neighbourhood? Using place identity and social norms to promote pro-environmental behaviour / ¿Reciclar para mi barrio? Empleando la identidad de lugar y las normas sociales para fomentar el comportamiento pro-ambiental. *Psycology*, 1-32.
- Lozano, A., & Fernández, J. (2020). Educating digital citizens: An opportunity to critical and activist perspective of sustainable development goals. *Sustainability (Switzerland)*, 1-14.
- Mankoff, J., Fussell, S. R., Dillahunt, T., Glaves, R., Grevet, C., Johnson, M., . . . Setlock, L. (2010). StepGreen.org: Increasing energy saving behaviors via social networks. *ICWSM 2010 - Proceedings of the 4th International AAAI Conference on Weblogs and Social Media*, 106 - 113.
- Martinec, R., & Salway, A. (2005). A system for image-text relations in new (and old) media. *Visual communication*, 4(3), 337-371.
- Merle, M., G. R., & Drews, S. (2019). #Globalcitizen: An Explorative Twitter Analysis of Global Identity and Sustainability Communicationsu. *sustainability*, 11, 3472, 2-10.
- Noon, E. J. (2020). Compare and despair or compare and explore? Instagram social comparisons of ability and opinion predict adolescent identity development. *Cyberpsychology*.
- O'Halloran, K. (2012). Análisis del discurso multimodal. *Revista Latinoamericana de Estudios del Discurso*, 75-97.
- Painén, G., Ramírez, P., Alfaro, J., Melo Mariano, A., & Machorro, F. (2018). Explicando el uso de Instagram en Chile: Una aplicación de la técnica de árboles de decisión. 626-636.
- Reuters Institute . (2020). *Digital News Report* . Oxford : Reuters Institute for the Study of Journalism.
- Santana, L. (2016). "Ciudadanía en la esfera pública híbrida". En A. Arriagada, *El mundo en mi mano: la revolución de los datos móviles* (pág. Capítulo 5). Santiago : Fundación País Digital y Entel Chile.
- Sherman, L. E., Payton, A. A., Hernandez, L. M., Greenfield, P. M., & Dapretto, M. (2016). The Power of the Like in Adolescence: Effects of Peer Influence on Neural and Behavioral Responses to Social Media. *Psychological Science*, 27, 7 , 1027-1035.

- Sigerson, L., & Cheng, C. (2018). Scales for measuring user engagement with social network sites: A systematic review of psychometric properties. *Computers in Human Behavior*, 87 - 105.
- Strauss, A., & Corbin, J. (2002). *Bases de la investigación cualitativa. Técnicas y procedimientos para desarrollar la teoría fundamentada*. Medellín, Antioquia: Sage Publications.
- Suls, J., Martin, R., & Wheeler, L. (2000). Three kinds of opinion comparison: The triadic model. *Personality and social psychology review*, 4 (3), 219-237.
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the Social Group: A Self-Categorization Theory*. Oxford: Blackwell.
- United Nations. (05 de noviembre de 2015). *Climate Change*. Obtenido de United Nations: <https://www.un.org/en/sections/issues-depth/climate-change/>
- van Deursen, A. J., & van Dijk, J. A. (2014). The digital divide shifts to differences in usage. . *New Media and Society*, 507-526.
- Vesely, S., & Klöckner, C. (2018). Global social norms and environmental behavior. *Environment and Behavior*, 50,, 247-271.
- Vromen, A., & Collin, P. (2010). Everyday youth participation? Contrasting views from Australian policymakers and young people". *Young: Nordic Journal of Youth Research*, 18,, 97-112.
- Williams, H. T., McMurray, J. R., Kurz, T., & Hugo Lambert, F. (2015 ). Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Global Environmental Change*, 126-138.
- Yang, C. c., & Robinson, A. (2018). Not necessarily detrimental: Two social comparison orientations and their associations with social media use and college social adjustment. *Computers in Human Behavior*, 49-57.
- Zhu, C., Xu, X., Zhang, W., Chen, J., & Evans, R. (2020). How health communication via tik tok makes a difference: A content analysis of tik tok accounts run by Chinese provincial health committees. *International Journal of Environmental Research and Public Health*, 1-13.