

#Default #Interactiveart #Audienceexperience

Learning from the visual analysis of content shared on Instagram

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ABSTRACT

The last decades have shown us a growing interest in different fields of how interactive art transforms the position of the viewer into a participant and how audiences engage and relate to interactive artwork. This article presents a visual analysis of the content shared on Instagram by the audience of Default –an interactive art installation presented in Santiago, Chile in 2017. The analysis shows that people reacted and engaged differently with various aspects of the installation, as shown by the strategies they used to share it. We argue that the analysis of the visual content of Instagram posts opens avenues to understanding the relationship between installation and audience, giving clues on the audience experience and, therefore, providing feedback for developers, who could use them in the design process of future installations.

CCS CONCEPTS

- HCI design and evaluation methods • Social media networks • Media arts

KEYWORDS

Interactive art evaluation, Instagram, Social Media, Arts, and culture on the web

1 Introduction

The use of digital technologies in art has transformed the visitor into a participant, where the visitor no longer contemplates an object or artefact, but has access to an experience [9]. This has led many artists to include evaluations in their work in order to understand which aspects of an art installation impact the user's experience and perception [9,38,4]. The approximations to evaluate art installations vary from documented reflective practice to evidence-based methods [11]. Much of the progress in this context can benefit from digital art and HCI research. Nevertheless, in interactive art the interest generally focuses on how the artwork behaves, how the audience interacts with it and their degree of engagement [16].

In this article we focus on the latter, using Instagram as a way to analyze the experience of the audience while visiting an interactive art installation and learn from this to enhance future iterations of the artwork. *Default*, the installation that provided context for this work was exhibited at the Contemporary Art Museum of Santiago de Chile in 2017. It explored the dynamics of consciousness and memory through visualization and sonification of data. It is inspired by the concept of the neuroscience discovery of the default mode network (DMN).

While the installation was exhibited, visitors spontaneously shared images and videos on Instagram about it. This meant –on the one hand– that the interaction with the installation was taken beyond the museum walls and into the digital space, therefore amplifying its reach and impact and –on the other– that the audience appropriated the installation, reframing it and creating new artwork based on their experience.

By observing this phenomenon, we formulated the following questions: Could Instagram posts be used as data to analyze the visitors' experiences? Could they be visually analyzed, in terms of their content, to better understand the impact of the installation? How could these data be used to learn and enhance future design processes?

Following these questions, this paper presents and discusses the results of the analysis of the visual content of Instagram posts¹, which proved to be useful in accessing the audience experiences, particularly with regard to the interactive, immersive and aesthetic qualities of the installation. Despite the fact that this work is based on a relatively small number of cases (53), we found evidence to argue that this type of analysis provides useful feedback from the audience experiences to the researchers, regarding what captivated them and how they interacted with the installation. We discuss that these data that can be incorporated in future iterations and design processes, providing guidelines for eventual artistic installations. Given that social media analysis tends to use quantitative data to assess the impact and engagement with the content share, we argue that the visual analysis of the visual content also contributes to enrich such analysis by providing alternative avenues to access qualitative data of the audience experiences, particularly for audiences of 35 years old or younger, who constitute the larger group of Instagram users.

2 Context

Default was an interactive artistic installation that explored the dynamics of consciousness and memory through visualization and sonification of data, inspired by the concept of the neuroscience discovery of the default mode network (DMN) [30]. The DMN consists of a group of brain regions, which activate when the mind starts wandering. The project was led by one of the authors of this article: Manuela Garretón (design) in collaboration with Tomás Ossandón (cognitive neuroscience).

Default consisted of the representation of the two main brain states, the resting state (when the DMN is active and the brain registers a high level of activity) and the attention state (when the brain responds to an external stimulus and the DMN is disabled). The installation was conceived as a visual and sound environment based on data recorded in a functional magnetic resonance imaging (fMRI) of a person in resting state. The interior space of the room was designed as if it were the interior of the brain [17]. The visitors acted as an external stimulus, activating the attention state. *Default* was designed to generate a visual, aesthetic and immersive environment where the audience not only sees the visualization, but can also enter, move and navigate through it. A 3D animated visualization was designed to be projected in three continuous walls of the room. The system (visualization and sonification) responded to the behavior of the audience through the implementation of two inputs. An infrared camera (Kinect), identified people and their positions inside the room, and reacted to their movements changing the projections up the wall, therefore, creating an interactive loop.

Default was presented in the Museum of Contemporary Art (Parque Forestal) in Santiago, Chile in 2017. The goals of the installation were: (1) To display the representation of intrinsic dynamics of brain in an interactive artistic space (2) to create a medium to disseminate the existence of the DMN and its related concepts for a non-expert audience (3) To captivate and engage the audience with an aesthetic, interactive and immersive experience. The objectives of this project defined three complementary research line and this article focuses on the one related to the understanding of the audience experience in *Default*.

By design, the audience experience in *Default* was supposed to be assessed only through videos registered by the research team. However, during the exhibition, it became apparent that some visitors were spontaneously uploading and sharing their experiences on Instagram, therefore making an explicit gesture of appropriation of the installation. In reviewing these posts we wondered about the great potential for analysis that this material could have to access the experience of visitors in *Default*. This was an emergent result of the exhibition that gave us a privileged glimpse into the audience experience and what was interesting to them. The work that follows describes the questions that arose from the first observations of this collected data and the subsequent analysis.

¹ From now on, "Instagram post" will be used to refer to the visual content published, not including captions, hashtags, comments or likes of the post.

3 Related Work

3.1 From Neuroscience to an interactive artwork

In order to understand the questions we asked ourselves about the visitors' experience it is important to underscore two defining features of Default as an art installation: its interactive nature and its roots in scientific concepts. Both are key to situate Default in a multidisciplinary field.

In the last decades, the combination between arts, sciences and technologies, including new media, digital art and interactive art [38] has brought knowledge to non-expert audience, offering a unique contribution to engage the public with complex scientific issues [24]. Under the concept of Sci-Art, a new approach has developed to engage broad audiences with complex scientific knowledge, by exploring a new language that emerges from intimate, sensory, persona, human-scale narratives, metaphors and aesthetics [8]. These projects have reached various subjects such as genetics, neuroscience, climate change, astronomy, and so on, and have emerged from the traditional performance arts, interactive installations, sound art, data visualization, interactive web documentaries, among others [39,24,23,8,19,28,18].

The emergence of sci-art as a bridge between the scientific community and non-expert audiences is related with the understanding that art flourishes most when it serves a social function [5, 25]. Artwork becomes meaningful through interactions and engagements with an audience.

It is in the interaction between the visitor and the installation where the artwork completes itself –even if temporarily and in a relation-specific way– and acquires meaning. The characteristics of the interaction are shaped by the singularities of each visitor and to know them would be crucial to developing future iterations of the artwork. Consequently, it becomes important to have access to that personal and situated experience. The question remained is how to do it.

Given all the above, it was possible to conceive Default as an interactive sci-art installation. This conception, however, required a thorough analysis of the experiences. Had they not interacted with the installation, this intended feature would not have come to fruition. Yet, how could we learn about the visitors' experiences? How can we learn about their interaction with Default? Instagram as a visual social media proved to offer an insightful glimpse of the visitors' experiences.

3.1 Instagram as a platform to share experiences

Instagram is a social network that allows registered users to upload pictures and videos to a mobile and a desktop application. Users have the capability to caption the content, add locations through geotags, hashtag their posts and tag other users. By now (January 2019) it has reached over one billion monthly active users [22]. Of the total users, 68% are younger than 35 years old [35]. Even though until now this social network has not been vastly used, it is a very useful tool to obtain data, images, video and opinions regarding social research. It has been used for the analysis of user experiences in various areas such as cultural studies [21,26], urbanism [36] and more specifically to discuss the engagement of exhibitions at a museum [37].

The predominant visual language of Instagram is relevant given that the production of images has been considered a meaningful way to express one's experiences in a language that has gained greater centrality in our culture, that plays a major role in most people everyday life [31,32,33,43] and that allows for expression and articulation of aspects and experiences that are not always easy to verbally express. Moreover, it has been argued that the communal photographic exchange occurring over Instagram is implicated in the production of identity, as cultural consumers and producers [8].

On the other hand, the understanding of art as an experience has lead digital artists to include evaluations within their works with several purposes: mostly, to understand how the artwork is perceived by the audience and get a broad view of the visitor experience [10,11,6,7]. The approximations to evaluate interactive art vary from documented reflective practice to evidence-based methods [10, 11]. Much of the progress in this context can benefit from the digital art and HCI research. There is constant feedback between both areas. Many of the methods practiced in HCI are used as starting points to evaluate artistic experiences. Some of these go from quantitative methods to identifying patterns of interaction [18] and qualitative analysis based on observations between the visitor and an interactive artwork [6]. Nevertheless, in interactive art the interest generally focuses on “how the artwork behaves, how the audience interacts with it and, (...) ultimately, in participant experience and degree of engagement” [16].

In the case of Default, once we realized that visitors were sharing Instagram posts about their visit we saw an opportunity to approach the evaluation of their experience within the artwork. We observed that visitors not only were sharing part of their experiences on a visual way, but they were also appropriating the installation, re-framing it from their own perspective and, by doing this, somehow creating a new artwork. For us this new artworks become a way to have access to that personal experience. So, what can we learn from the images created from the users' experience in an interactive space? Could they be a way to approach the evaluation of interactive art experiences?

4 Materials and Methods

This article builds on the analysis of emerging results of the interactive art installation, more than corresponding to an independent research project. However, it could be conceptualized in the line of what has been defined as arts-informed research [12, 43], which has among its goals, accessibility and breadth of audience and which is “part of a broader commitment to shift the dominant paradigmatic view that keeps the academy and community separated, to acknowledge the multiple dimensions that constitute and form the human condition [...] and the myriad of ways of engaging in the world—oral, literal, visual, embodied” [12]. Therefore, both the arts-informed research audience engagement and a social commitment are both key.

4.1 Data Handling

To carry out this study we searched for every Instagram public post made by the audience while the exhibition was open to the public (8th September 2017 - 12th November 2017). We searched by location in the Instagram website using the geotag of the museum “MAC / Museo de Arte Contemporáneo”. Also, we searched for the National Fine Arts Museum geotag “Museo Nacional de Bellas Artes - Santiago de Chile”. Because both museums are located in the same building and we corroborated that several users might have made this mistake when selecting from the prompted list that Instagram provides based on the device location. We found a total of 53 posts that belonged to publicly accessible Instagram user accounts. Once we identified all the posts we firstly collected their urls and then used import.io, a free online tool that allows people to extract the items on a website into a dataset. We gathered images and video urls, names of user, captions, number of likes, among others. Next, we downloaded all the images and videos so that they could be maintained for exploration during analysis.

4.2 Data Analysis

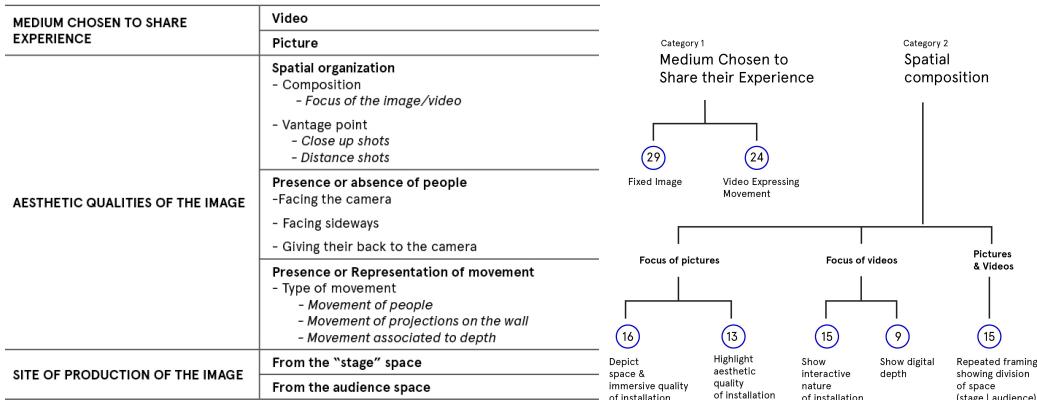
Previous works have highlighted that one of the main challenges in the use of images or videos for research is the lack of a standard “set of rules” to analyze them, given the polysemic nature of visual data [20, 34, 40]. For the purpose of this research, we analyzed all the available Instagram posts (53) following proposals by Acosta [1] Rose [34] and Gleeson [20] in terms of what to focus on and how to conduct the analytical process.

Acosta [1] highlighted the importance of observing and analyzing the aesthetic and dynamic properties of each image. Rose [34] focused her visual analysis in examining the content of images to identify patterns, coding and analyzing such patterns to draw conclusions, and Gleeson [20] in her polytextual thematic analysis for visual data underscores the importance of analyzing images in a number of iterations, to capture proto-themes that eventually turn into higher-order categories.

Following the above mentioned methodologies, and after the first iteration analyzing our data, it became evident that a number of criteria were relevant to systematically observe in order to understand the images and videos (Fig. 1). Following the emerging criteria, the analytical process was iterated a number of times with images and videos projected on a 51-inch screen.

Each picture was first analyzed individually, secondly, all the pictures were analyzed together, with a focus on recurring patterns, themes and differences, using the criteria shown in Figure 2: (1) medium chosen to share the experience, (2) aesthetic qualities of the image and (3) site of production of the image. Then, videos were analyzed following the same steps. Finally, the joint data from videos and pictures were analyzed. From each analytic stage a number of proto-themes related with the experience of the visitors were developed. Eventually, these proto-themes were grouped to develop two higher order categories that

connected all of them, and that serve to identify different appropriation strategies of the installation utilized by the visitors. The analytic process, in all its iterations, was conducted by two researchers as a way to increase the rigor, and reliability of the process.



Figures 1 and 2: (Left) Emerging relevant criteria used to analyze Instagram posts (Right) Strategies used to share experience, and number of appearances (N=53)

5 Findings

It is possible to assert that a number of people (53) felt captivated enough by Default to spontaneously register and publicly upload an image or video about it. In addition, a significant number of followers felt something similar, to like those posts (1,296) and view the videos (2,054). This is relevant, given that it was not intentionally prompted –or expected– by the researcher’s team by providing a hashtag to identify it. By tagging themselves in the museum, and sharing their experiences, people are inscribing the installation in their trajectories, therefore, appropriating it. Through their Instagram posts, people showed what was particularly interesting and/or curiosity triggering for them, offering a glimpse into their experiences.

The analysis of the images and videos posted on Instagram allowed us to distinguish two main categories, related with strategies used by the audience to respond to the aesthetic, interactive and immersive nature of the installation: (1) Medium chosen to share their experience and (2) Spatial Composition. The results show that these two strategies do not appear in isolation, but tend to interact to some extent. (Fig.2)

5.1 Medium chosen to share the experience

We observed that people used the two mediums offered by Instagram to share their experience: images (29) and short videos (24). The difference between mediums is meaningful given that, as Moon [29] stated, this election is one of the first forms to appropriate of the artistic/aesthetic experience. By its very nature, photographs fixate an image, while videos are suited to express movement. Thus, the chosen medium relates to two distinct modes to represent the experience within the installation: one that focuses on showing the interaction with it, moving along with it and another, that responds more to the aesthetic quality of the installation, registering it in a fixed way.

5.1.1 Sharing the interaction through videos

Twenty-four people utilized videos to share their experience (17 short videos, 2 videos edited with timelapse and 5 boomerang). As expected given the nature of the medium, movement was the most significant feature of these Instagram posts. However, it is relevant to note that the movement depicted was not a feature “added” by the people, but depicted the interaction with the installation, as movement is a key feature of it.

Movement was depicted through three different strategies: (1)Moving the camera across the space to show the movement of the projections (video 1)²; (2) Showing people moving around the exhibition; (3)Keeping the camera fixed, zooming in and out the lens to show the depth of the projections (video 2)³.

Despite the different techniques utilized by the audience, one thing was clear: they accounted for the experience of interaction. People followed the pace and rhythm suggested by the projections, some even danced along (video 3)⁴. In doing this, people displayed their being affected by the nature of the installation and also, showed a playful behavior and sense of enjoyment.

5.1.2 Sharing the aesthetic quality of the installation through pictures:

The pictures shared emphasize the graphic nature of the projections, as shown by their careful framing and composition. All images focus on the projections up the wall, as shown by the fact that they occupy approximately 80% of the space (or more) of each picture. In fact, a person even edited the image (Fig. 4), drawing figures like the ones projected, to complete the space. The edition of images in terms of color (black and white; sharpening) was used to emphasize contrast and better outline figures, accentuating clarity and definition of the image. Finally, the care for composition can be observed in the balanced nature of the images: most people clearly established a center, depicting an intention to articulate the image as a whole.

5.2. Spatial Composition

The visitors responded to the space of the interactive installation differently, as shown by the spatial composition of the Instagram post, which is expressive of a perspective and a point of view, particular to the viewer. This interacted with the medium chosen by the visitors to share their experience.

5.2.1 Pictures:

Pictures had two main foci: (1)To depict the space and the immersive quality of the installation; (2) to highlight the aesthetic quality of the installation in relation with people's presence within the space. This difference among the images signals two different strategies of appropriation of what the installation has to offer to the audience. However, as it will be shown, no strategy is absolute, displaying some mixed qualities despite the predominance of a certain focus.

The first strategy, used by 16 people, entails photographing the space from some distance as a way to "make it appear". Some people included two angles of the room (i.e. three walls) (Fig. 3), and some only one angle (i.e. two walls), but all the pictures of this kind keenly convey the immersive quality of the installation. The person is *in* it. The composition proportion person: space reveals that the person cannot capture all what is happening on a glimpse. He/She needs to move around to interact with the space. In this sense, the installation challenges the experience of being a "mere observer" of the artwork and calls for movement. It is interesting to note that in most pictures, even though people were clearly outsized by the installation, they did not entirely relinquish a central role in the picture, tending to place themselves near the center. Also, because they appear darker than the projections on the wall, the contrast highlights their presence, therefore gaining a protagonist stance.

The second strategy entails photographing the walls from a much closer vantage point, in the mode of portraits focusing on the subject. As a consequence of this focus, the composition of the image results in a "flattening" of the space, making it appear mostly as background (fig. 4 & 5). This, however, does not mean that people did not take into account what the installation offered, or that they merely used it as a "prop" for highlighting themselves in a way that does not recognize the installation qualities. On the contrary, each of these posts –in its composition– responded and was highly attuned to the aesthetic quality of what the installation presented, therefore demonstrating the impact it had had on the people. For those

2 Video 1: To see an example of fixed camera and people moving visit https://www.instagram.com/p/BZ2BSXsj1vh/?taken-by=pipexs_jt [29]

3 Video 2: To see an example of digital depth <https://www.instagram.com/p/BZrGJftj1U2/?taken-by=diegorubio83> [15]

4 Video 3: To see people dancing visit <https://www.instagram.com/p/BabXYILnrNf/?taken-by=bryanmerino.l> [2]

who flattened the image, it could be argued that the graphic nature of the projection was more appealing than the immersive and/or interactive quality of the installation.



Figure 3, 4 and 5: (Left) Person immersed in the space [13] (Center and Right) The wall projections as portrait background [28, 13]

In fact, it is interesting to consider that even though these 13 images could be conceptualized as portraits, only three people were facing the camera (and the intended viewer of the image). Most of them were either standing sideways (4) or had their back to the camera (4), all facing the projection on the wall. In two cases, the minimum light made it difficult to recognize their orientation. Therefore, it is possible to argue that if the camera focuses on the person, and the person mostly focuses on the projection, the focus of the image also shifts to the wall, emphasizing its importance.

Some “mixed cases” were those of Instagram posts made with *Boomerang*. Here the movement corresponds to only one second looping video made with ten images stitched together that look more as an animated GIF than a proper video. Therefore, *boomerangs* (5) could be considered as representing an intermediate position, where movement is not necessarily related with the interactive nature of the installation.

5.2.2 Videos

15 out of the 24 videos showed people. However, the foci of those videos were not people in themselves, but demonstrating the interactive nature of the installation, showing how people’s movements –captured by the infrared camera– changed the projections on the wall, creating an interactive loop where people responded with their movements to the rhythm suggested by the projections and, in turn, the projections were affected by the people’s movements (video 1).

Videos without people, where the camera moves to show a close up (video 2), focus on capturing the digital depth of the projection, showing the intention to “enter” the projected space, move through it and capture the experience of being “inside the visualization”. Thus, these kinds of videos convey the immersive quality of the installation beyond the mere representation of people being *in* the space (as was shown in the pictures). They “enter” a digital space of the projected visualization that amplifies the material conditions of the real space, which is quite modest.

5.2.3 Pictures and videos

On the other hand, when analyzing the viewer’s point of view in both videos and images, we observed significant similarities in terms of revealing the position of the person who took the picture or video. In this way we deduce that almost every picture was taken from the back of the room. Thus, what varies in every Instagram post is the depth of the registry.

Based on these observations we can conclude that the framing is similar in almost every image, the contents are essentially the same (the projections with a person facing backwards) and the element that varies upon the pictures is the depth of registration. This could be attributed to the material conditions of the room where Default was installed, which favored the creation of an unintended “virtual space”. This virtual division created a “stage”, which contributed to determine different places and roles inside the room for the audience. The spectator-performer who uses “the stage”, interacts with the projections and sound can be recognized as a performer, and the spectator-audience –who observes from the back of the room assuming a role of an audience and captures videos or pictures of what is happening on “the stage”–.

To summarize (Fig. 2) by analyzing the images and videos in the categories we can say that:

- (1) To choose images as a medium to share experiences demonstrates the focus on the *aesthetic* nature of Default, while choosing videos reveals the importance that visitors give to the *interactive* feature.
- (2) The spatial composition of images shows a first group (slightly predominant) depicting space thus capturing the *immersive* quality of the installation. While a second group flattened the images, appropriating the *aesthetic* nature of Default.
- (3) When people are included in videos is mostly to express the *interactive* quality of the installation. Videos without people, on the other hand, emphasize the *immersive* quality of the projected visualization.
- (4) The framing of the images and videos repeats among the retrieved Instagram posts, but the depth from where they are taken varies.
- (5) It is possible to recognize two types of spectators that occupy different places and roles inside the room; the spectator-performer and the spectator-audience. These roles also determine an unintended virtual space: the ‘stage’ and the ‘audience’.

6 Conclusions

The aim of this article was to assess if the visual content of Instagram posts could be used as data to analyze the visitors’ experiences, and if this content analysis of visual data could be used to better understand the impact of the installation and, how could this data be used to learn and enhance future design processes.

The findings offer evidence that is possible to visually analyze Instagram posts in terms of their visual content. The images and videos proved to be useful in distinguishing the way audiences experienced the installation, offering qualitative data regarding its impact. This offers a complement for more traditional social network analysis, which tends to provide data regarding the quantitative impact and engagement of the content shared.

In the past, analysis of Instagram posts has been used to assess visitors’ experiences in museums [9, 37]. *Default*, however, had the particularity of being an interactive art installation. Our findings allow us to conclude that the visual content shared on Instagram accounts for differences between those visitors who felt more captivated by the aesthetic quality of the installation and those who highlighted the interactive and immersive quality of the installation. The fact that Instagram –as a platform– offers the possibility to share pictures and videos proved to be key in this respect. Those who felt particularly captivated by the aesthetic quality of the installation tended to use pictures and highlight the graphic nature of the projections, sometimes at the expense of depicting the space as a whole, therefore leaving aside the immersive and interactive nature of the installation. People who felt mostly captivated by the interactive nature of the installation privileged the use of videos that allowed conveying movement, and how their movements and the movements of the projection mutually influenced each other. Finally some people were more responsive to the immersive quality of the installation, as shown by their representation –through pictures– of being *in* the space and –through videos– to enter the digital depth of the projection, virtually amplifying the space of the room. This helps us understand that the content analysis of visual data is useful to understand the visitors’ experiences, while taking into account the specificities of installations. This is relevant, given that –as Budge [8] has argued, often times, the analysis of visitors’ experiences is at the expense of understanding the object of installations.

For the artists and designers behind *Default*, analyzing the visitors’ experiences through the visual content they shared on Instagram proved to be enlightening. For example, the analysis of the framing of the posts made visible the occurrence of a virtual division of the space that led to configuring different roles among the visitors: audience and performer. In retrospect, this might seem obvious; however, it was not clear for the developer team during the design process and offers an example of how analyzing the users’ experiences can lead to modifications in further iterations. If *Default* was to be shown again, projections should be up all the walls of the room, to avoid such virtual division and to enhance even more the immersive experience. Thus, this experience not only offers evidence that the analysis of visual content shared on Instagram by visitors can be a useful tool for other designer/artists, but also, gives an example of how analyzing visitors’ experiences opens avenues to further include intended audiences in the designing process. This, in turn, could help to effectively achieve the goals of sci-art, in terms of building bridges

between the scientific community and non-expert audiences, and to democratize the designing process, helping artistic installations to better serve a social function [5, 25].

Among the limitations of this study we can count that Instagram users tend to be younger than 35 years old and therefore, it is not a platform appropriated to access nor analyze the experiences of older audiences. Thus, we cannot generalize the findings beyond this age group. Another limitation is the relatively small number of analyzed posts (53). A greater number could help us develop more conclusive findings, particularly given the possibility to access them easily. Given that the team did not provide in advance a hashtag, geotag or other identifier for the post related to the installation, it is possible to think that we missed posts.

The above leads to recommend that future works that might use Instagram as a platform to access audiences' experiences, is to provide both a hashtag and a geotag to unify the way of referencing the installation and easily access related Instagram posts. If various hashtags were provided (related with different aspects of the installation –for example: #defaultatMAC; #defaultSantiago; #defaultmodenetwork; #defaultinteractive; #defaultsciart, among others possible) the analysis of the hashtags chosen and caption written by the users could be utilized to further understand the aspects of the experience that they were emphasizing.

The process of analysis we propose in this work could be synthesized as follows: (1) Provide a hashtag at the exhibition; (2) Search for the hashtag provided; (3) Identify all the Instagram posts and then download all the pictures and videos; (4) Analyze the pictures and then videos, separately. We recommend that this step and the following be performed by at least two researchers in order to increase the rigor and reliability of the process; (5) Analyze pictures together, with focus on the content to identify recurring patterns, themes and differences; (6) Analyze videos together, with focus on the content to identify recurring patterns, themes and differences and (7) Analyze pictures and videos together to capture proto-themes that could turn into higher-order categories, to give account for the overall visitors' experiences.

In summary, we conclude that the visual analysis of Instagram posts shared is an effective way to identify and understand the impact of humanities, arts and culture in the web and also to develop the understanding about social media and its uses by web users and communities.

Finally, considering the growth and ease of accessibility of tools available for image processing, which can automatically perform image segmentation (e.g. SegNet [3]), there is room to increase the scale of this type of analysis for larger audiences.

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REFERENCES

- [1] Ikuko, Acosta. (2001). Rediscovering properties inherent in art. *American Journal of Art Therapy*, 39 , 1 (Feb.2001) 93-97.
- [2] M. Alejandro, alejandromerino.l. (2017).  . Retrieved December 17, 2017 from <https://www.instagram.com/p/BabXYILnrNf/?taken-by=bryanmerino.l>
- [3] V. Badrinarayanan, A. Kendall, and R. Cipolla (2017). Segnet: A deep convolutional encoder-decoder architecture for image segmentation. *IEEE transactions on pattern analysis and machine intelligence*, 39(12), 2481-2495.
- [4] S Barrass, and A. Sanchez (2014). *Experience and Evaluation in the Collective Creation of a Public Digital Exhibition*. In L. Candy and S. Ferguson, ed., Interactive experience in the digital age: evaluating new art practice. 209-219. Springer, Sydney.
- [5] A. de Botton, and J. Armstrong (2013). *Art as therapy*. Phaidon, New York.
- [6] Z. Bilda, L. Candy, and E. Edmonds (2007). *An embodied cognition framework for interactive experience.. CoDesign* 3, 2, 123-137
- [7] Zafer Bilda, Chris Bowman, and Ernest Edmonds. 2008. Experience evaluation of interactive art: study of GEO landscapes. In *Proceedings of the 5th Australasian Conference on Interactive Entertainment* (IE '08). ACM, New York, NY, USA, Article 1, 10 pages. DOI: <https://doi.org/10.1145/1514402.1514403>
- [8] G. Born and A. Barry. (2010). ART-SCIENCE. *Journal of Cultural Economy* 3,1, 103-119.
- [9] K. Budge (2017). Objects in focus: Museum visitors and instagram. *Curator: The Museum Journal*, 60, 1, 67-85.

- [10] L. Candy and S. Ferguson (2014). *Interactive experience in the digital age: evaluating new art practice*. Springer, Sydney.
- [11] L. Candy. and E. Edmonds (2011). *Interacting: art, research and the creative practitioner*. Libri.
- [12] A. Coles and G. Knowles, 2008. Arts-informed research. In G. Knowles & A. Cole (Eds). *Handbook of the arts in qualitative research*. Sage Publications, Los Angeles, CA, United States
- [13] Cristian, cris.ignaciocm. (2017). Deja de pensar y abre tus sentidos. Retrieved December 17, 2017 from <https://www.instagram.com/p/BZ4eygVlc9S/?taken-by=crissnacio>
- [14] C. Daniela, L. daconterrasl. (2017). Default, de la diseñadora Manuela Garretón y el neurocientífico Tomás Ossandón. Retrieved December 17, 2017 from <https://www.instagram.com/p/BZehf00ntoR/?taken-at=1314752441907553>
- [15] R. Diego, diegorubio83. (2017). Divagando - Mind Wandering 🤔🇪🇸
- [16] E. Edmonds (2014). Chapter 2: Human Computer Interaction, Art and Experience. In L. Candy and S. Ferguson, ed., *Interactive experience in the digital age: evaluating new art practice*. Springer, Sydney.
- [17] M. Garretón, T. Ossandón and K. Hyland, 2018. Default. Design and Neuroscience: Interactive Work on Brain Activity. *Diseña*, 12, 286-299
- [18] M. Garretón, K. Hyland. and D. Parra 2017. Understanding People's Interaction with Neural Sci-Art. *Proceedings of the IEEE VIS Conference, Arts Program VISAP '17*.
- [19] R. Gingrich, A. Emet, E and Z. Xiao, 2014. "Transmission: A Telepresence Interface for Neural and Kinetic Interaction", *Leonardo*, 47, 4, 375-385. DOI https://doi.org/10.1162/LEON_a_00843
- [20] K. Gleeson. (2011). Polytextrual thematic analysis for visual data. Pinning down the analytic. In Reavey, P. (Ed.). *Visual methods in psychology. Using and interpreting images in qualitative research*. Psychology Press, New York.
- [21] N. Hochman, and R. Schwartz, 2012. Visualizing Instagram: Tracing Cultural Visual Rhythms. AAAI Technical Report WS-12-03 Social Media Visualization.
- [22] Instagram. (2018). Our Story. Retrieved January 14, 2019 from <https://instagram-press.com/our-story/>
- [23] Rachel Jacobs, Steve Benford, Ewa Luger, and Candice Howarth. 2016. The Prediction Machine: Performing Scientific and Artistic Process. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems (DIS '16)*. ACM, New York, NY, USA, 497-508. DOI: <https://doi.org/10.1145/2901790.2901825>
- [24] Rachel Jacobs, Steve Benford, Mark Selby, Michael Golembewski, Dominic Price, and Gabriella Giannachi. 2013. A conversation between trees: what data feels like in the forest. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13)*. ACM, New York, NY, USA, 129-138. DOI: <https://doi.org/10.1145/2470654.2470673>
- [25] E. Kramer. (2000). *Art as therapy. Collected papers*. Edited by Gerity, L. Jessica Kingsley Publishers. Philadelphia.
- [26] L. Manovich (2017). Instagram and Contemporary Image. Retrieved January 14, 2019 from http://manovich.net/content/04-projects/147-instagram-and-contemporary-image/instagram_book_manovich.pdf
- [27] C.H. Moon (2010) (Ed.). *Materials and Media in Art Therapy: Critical Understandings of Diverse Artistic Vocabularies*. Routledge. Florence, KY.
- [28] Oda M, odamoura. (2017). Que confusão gostosa!bjus. Retrieved December 17, 2017 from <https://www.instagram.com/p/Balws25AHBe/>
- [29] Pipexs_jt. (2017) Un breve timelapse de una presentación artística. Retrieved December 17, 2017 from https://www.instagram.com/p/BZ2BSXsj1vh/?taken-by=pipexs_jt
- [30] M. Raichle, A. MacLeod, A. Snyder, W. Powers, D. Gusnard and G. Shulman, 2001. A Default mode of brain function. In *Proceedings of the National Academy of Sciences* 98, 2
- [31] P. Ravey and K. Johnson, 2008. Visual approaches: using and interpreting images. In Willig, C. & Stainton-Rogers, W. (Eds). *The Sage handbook of Qualitative research in psychology*. Sage Publications Ltd. London.
- [32] P. Reavey (2011). The return to experience. Psychology and the visual. In Reavey, P. (Ed.). *Visual methods in psychology. Using and interpreting images in qualitative research*. New York: Psychology Press.
- [33] C.K. Riessman (2008) Visual analysis. In *Narrative methods for the human sciences*. Sage Publica, Los Angeles, 141-182.
- [34] G. Rose (2002) Visual methodologies: *An introduction to the interpretation of visual materials*. Sage, London.
- [35] Statista. (2018). Distribution of Instagram users worldwide as of January 2018, by age group. Retrieved January 14, 2019 from <https://www.statista.com/statistics/325587/instagram-global-age-group/>
- [36] P. Toscano. (2017). Instagram-City: New Media, and the Social Perception of Public Spaces. *Visual Anthropology* 30, 3, 275-286.
- [37] A. Weilenmann, T. Hillman and B. Jungselius, 2013. Instagram at the museum. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems. CHI '13.
- [38] S. Wilson (2002). Information Arts: Intersections of Art, Science, and Technology (Leonardo). MIT Press.
- [39] R. West, J. Burke, C. Kerfeld, E. Mendelowitz, T. Holton, J. Lewis, E. Drucker and W. Yan. (2005). "Both and Neither: in silico v1.0, Ecce Homology", *Leonardo*, 38, 4, 286-293