Cultural Heritage through the Lens of COVID-19

Abstract

This study examines the discourse emerging from cultural heritage content shared online during the COVID-19 pandemic. It aims to understand the different affective and cognitive dynamics that are associated with the online sharing of cultural heritage in difficult times. To do so, we analyzed two Instagram hashtags – #ShareOurHeritage and #ShareCulture – that are promoted by UNESCO on a global scale. We applied a comprehensive quantitative method for qualitative data analysis. This method relied on Latent Dirichlet Allocation for topic modeling to generate automated induction of semantic topics and understand the underlying cognitive and affective dimensions of Instagram posts under each topic. Social values — including safety, inclusion, participation, and resilience — positive emotional language, and diverse cultural expressions were the most shared by the investigated hashtag community during the COVID-19 pandemic. In addition, results showed that users approach the virtual space as a substitute for the loss of their physical place through terms like home, virtual, online, travel tomorrow, and museums from home. Results are discussed in the context of the global digital divide, the social value of heritage to hashtag communities, and the use of Instagram as a longitudinal record of how cultural heritage values change across time.

Keywords: hashtag community, heritage values, COVID-19, sharing, social media

1. Introduction

The World Health Organization declared the coronavirus disease-2019 (COVID-19) as a public health emergency of international concern in January 2020 and as a pandemic in March 2020 (WHO, 2020). The measures taken by governments to prevent the spread of COVID-19 have had far-reaching socio-cultural implications on society and a significant impact on the cultural heritage sector. By April 2020, most World Heritage (WH) properties and museums across the world were closed to the public (Samaroudi et al., 2020). The stay-at-home orders were accompanied by a dramatic increase in digital media consumption and posting, as everyday practices moved online to contain the spread of COVID-19. To keep their function alive and increase access to cultural heritage, cultural institutions around the world turned to digital platforms providing online exhibitions, remote access with simulations, and virtual visits or tours to WH properties and museums.

Efforts to connect to cultural heritage and to engage in dialogues about history, collective memory, and shared experiences grew during the pandemic as evidenced by the launching of multiple hashtag campaigns at local and international levels to stress the role of culture and heritage as a source of inspiration, resilience, and artistic innovation in modern times. These

initiatives include #cinemadacasa in Rome, #WPDULSK20 in Russia, #CreativeAgainstCOVID in Kenya, #WindowsofMusiqueandHope in Liria, Spain, and #MuseumFromHome promoted by the San Francisco Museum of Modern Art among many others. In this research, we specifically address UNESCO's international social media campaign that launched the hashtags #ShareOurHeritage and #ShareCulture to promote and boost access to cultural heritage during mass confinement (UNESCO, 2020b). We chose this hashtag for three reasons: (1) it was promoted by a famous international intergovernmental organization dedicated to the conservation of cultural heritage, (2) the hashtags targeted all social media users, including kids, and supported a global and inclusive discussion, and (3) the campaign will not go "offline" once the immediate crisis is over but will be maintained to share reflections on measures to safeguard WH properties and promote sustainable tourism.

It is argued that during mass confinement, online access to cultural heritage could reduce social isolation and loneliness and sustain the educational and creative needs of diverse communities (Samaroudi et al., 2020). Many scholars have addressed virtual communities in the cultural heritage domain and have verified the promising applicability of social media metadata in cultural heritage research (Ott & Pozzi, 2011). Discussions are centered on connective memory, the co-construction of shared values, building narratives about collective meaning, identities, and experiences, and everyday practices (Hoskins, 2009; Sauter & Bruns, 2015; van der Hoeven, 2018; Agostino et al., 2020; Conti & Lexhagen, 2020; Ginzarly & Teller, 2020). Further to this, it is argued that hashtag communities represent a network and a virtual space that reflects people's preferences, beliefs, emotions, and experiences (Cuomo et al., 2016). In this research, we address the discourse of "sharing" heritage and cultural content on social media during the COVID-19 pandemic. We aim to understand how a hashtag community values cultural heritage in times of COVID-19, focusing, in particular, on the cognitive and affective dynamics that emerge from sharing cultural heritage content in difficult times.

To achieve our goal, we analyze Instagram posts under the hashtags #ShareOurHeritage and #ShareCulture from 9 April 2020 - the date the campaign was launched - to 12 August 2020 - the time of writing. In order to frame the cultural heritage discourse related to COVID-19, it is crucial to determine whether the campaign started a global discussion that didn't exist previously or rather enhanced an existing one. Posts for the same hashtags, from 9 April 2019 to 12 August 2019, were therefore investigated as well. We apply a comprehensive quantitative and qualitative

method using Latent Dirichlet Allocation (LDA) for topic modeling to generate automated induction of semantic topics from the Instagram posts' textual data and then understand the underlying cognitive and affective dimensions of posts under each topic. LDA for content inquiry of computer-mediated communication provides suitable navigation and knowledge discovery functionalities (Abbasi & Chen, 2008; Teplovs et al., 2011), allows the distillation of data-driven categories while avoiding human subjectivity (Evangelopoulos et al., 2012), and serves to measure nuances of meanings and yield robust substantive interpretation of a certain practice, event, or condition (DiMaggio et al., 2013).

2. COVID-19, hashtag community, digital photo sharing, and heritage

In this section we address the current state of research relative to the two prominent themes in our research: (1) digital photo tagging and sharing as a means to fulfill social interaction needs and communicate valued heritage aspects and (2) hashtag communities on social media as a virtual public space where collective semantics and shared values are co-created. We consider the evolution of both themes through the COVID-19 pandemic (Figure 1).

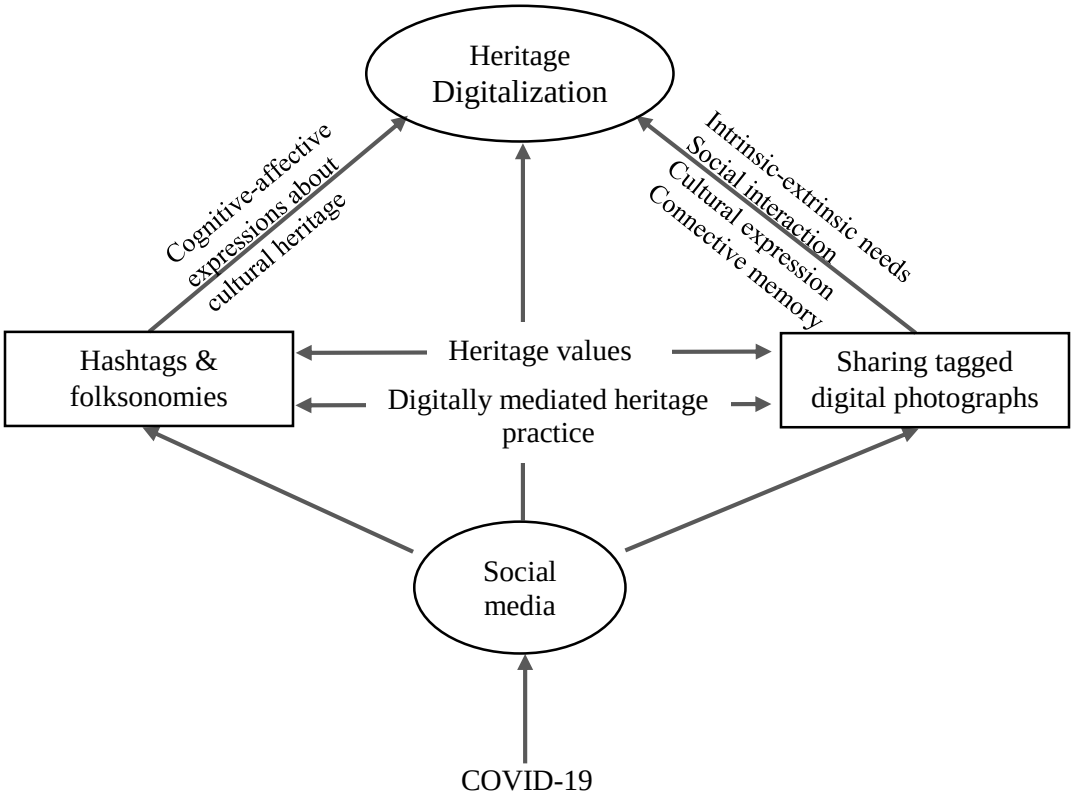

Figure 1. Conceptual Framework

2.1 Digital photo sharing and heritage

Photo sharing sites, such as Instagram, are commonly regarded either as spaces where communal views and experiences evolve as a result of picture exchange, or as visual archives where sharing pictures in the present naturally leads to a collective interpretation of the past, therefore leading to "collective perspectives, experiences, and memory" (van Dijck, 2011, p. 401). Photo sharing on social media is a form of cultural expression as photographs are the product of selecting, shaping, and constructing elements of the physical environment to reflect the photographer's mental image (Crawshaw et al., 2002). Sharing photos on social media is driven by functional and social motivations (Ames & Naaman, 2007). People upload geo-tagged photos on social media for their own memory and to gain popularity and build a reputation (Kim & Sundar, 2011; Lo et al., 2011; Gilbert & Barton, 2013; Su et al., 2016). Both producers and audiences engage in the production and consumption of social media content and their mutual interaction influences their visual perception and personal value judgment of shared content (Maares et al., 2021). People share photos online to fulfill their intrinsic, as well as extrinsic needs (Nov et al., 2010), as sharing can help them in fulfilling their social interaction needs, such as self-expression, self-presentation, communicating, and maintaining and nurturing social relationships (Goh et al., 2009; Van House, 2009; Oeldorf-Hirsch & Sundar, 2010). Furthermore, engaging with photos is a fun and joyful activity, as photos shared with others provide entertainment value to the users (Vartiainen & Väänänen-Vainio-Mattila, 2010). Accordingly, in difficult times, sharing photos can help people coping with crises and social isolation.

Multiple scholars have investigated motivations behind online photo sharing with various forms of gratification being the most frequently highlighted in the literature including affection, attention-seeking, disclosure, habit, information sharing, social influence, and social rewards in the form of comments and consequent conversation on shared photos (Ames & Naaman, 2007; Frohlich et al., 2002; Malik et al., 2016; Malinen, 2011; Nov et al., 2010; Phua et al., 2017). Deng et al., (2019) addressed the cognitive (e.g., knowledge, beliefs, and ideas) and affective (e.g., feelings) dimensions of shared online photos. Sharing is reaffirming the online space as a human and cultural space (Munar et al., 2013) as it builds a bridge between real and digital worlds, provides new tools to understand users' interests, preferences, and behavior (Bertacchini et al., 2018; Giglio et al., 2019), and informs our understanding of community sentiment towards places of cultural significance (Freeman, 2017). The extended practice of sharing on social media has

influenced many aspects of daily life practices, including heritage practices, as they have now become largely mediated by digital technology. There are diverse ways in which cultural heritage is digitally mediated, from the digitization of tangible and intangible heritage assets to audiences' engagement in cultural institutions, i.e. interactive digital storytelling in museums, and grassroots heritage practices through Facebook public groups (see Morgan & Pallascio, 2015; Bennett & Strong, 2018; Podara et al., 2021).

In heritage studies, Liang et al., (2021) have argued that as discussions about cultural heritage are increasingly transferred to the digital sphere, they are generating a rapid change in the production and consumption of cultural heritage. When members of virtual communities share content, discuss meanings, and generate heritage narratives, their digitally-mediated heritage practices provide new prospects for digitally-enabled forms of social production of cultural heritage values as well as a paradigm shift in the way communities engage with heritage (Liew, 2014; Gregory, 2015; Freeman, 2017, 2018). The digital engagement with heritage allows the possibility for enhanced cultural value through co-creation and participation (Nash, 2014; King et al., 2016). Given that cultural heritage is a socio-cultural construct — subject to diverse interpretations and perceptions from different stakeholders and multiple associations of values that change in space and across time (Graham & Howard, 2012; Taylor, 2016) — the digitally mediated interpretation, dissemination, and mobilization of heritage can contribute to the democratization of heritage values to include different community groups and go beyond experts' judgments and value systems (D. Brown & Nicholas, 2012; Morgan & Pallascio, 2015; Ginzarly & Teller, 2020).

Heritage values are socially constructed, ambivalent, and dissonant (Fredheim & Khalaf, 2016). At the end of the twentieth century, standard-setting documents and recommendations for the conservation and management of cultural heritage have emphasized the application of a value-based approach to heritage (ICOMOS, 1999; Council of Europe, 2005; ICOMOS, 2011; UNESCO, 2016). In parallel with this approach, scholars and organizations have developed various typologies of heritage values that include, but not limited to, aesthetic, social, historic, age, economic, political, scientific, and ecological values (Tarrafa Silva & Pereira Roders, 2012; de La Torre, 2013; ICOMOS Australia, 2013). In this framework, different quantitative and qualitative methods have been developed to assess and grasp diverse and sometimes conflicting cultural heritage values within different cultural contexts (Heras et al., 2013; Lourenço-Gomes et al., 2019;

Heredia-Carroza et al., 2020). Jones (2017) argued that while experts tend to focus on intrinsic historic and scientific values, the public is primarily concerned with social value. The latter is a process of valuing heritage places and includes people's sense of identity, experiences, practices, and feelings of attachment to place (Jones, 2017).

Conflicting interpretations of heritage, resulting from attaching different weights to cultural values and different significances to the same heritage asset by stakeholder groups, raise alternative narratives, and push the boundaries of the official heritage discourse (Beeksma & Cesari, 2019; Ginzarly et al., 2019). The online heritage discourse could facilitate inclusive decision-making processes as it allows to identify "aspects of value" that explain why a specific asset is of conservation interest and "qualifiers of value" that justify why some features should be prioritized in conservation efforts over others (Fredheim & Khalaf, 2016, p. 476). Nevertheless, social inclusion and online democratic heritage practices are dependent on the interactional trajectories, the processes and levels of public online engagement, social media platform design and technical architecture, and the personal, social, cultural, and political contexts in which the online practice operates (Pierroux et al., 2020; Robinson, 2020; Arnaboldi & Diaz Lema, 2021).

In tourism studies, Buhalis & Foerste (2015) argue that user-generated content on social media is a reflection of people's emotions, beliefs, and preferences about their travel experience. Since place experiences are drivers of value creation (Sørensen et al., 2018), when visitors share their experiences on social media they become agents of values co-creation in heritage places. The online practices of users who contribute photos, comments, and information translate into a collective view on events or a cultural heritage collection (van Dijck, 2011). In this context, new knowledge about cultural heritage is created out of thousands of pictures taken by individuals and repurposed to form our "common knowledge" of the world's popular places and cultural treasures (Murray, 2008; Snavely et al., 2008).

2.2 Social media, hashtags, and heritage in difficult times

As social media have become an important element in everyday life (Prideaux et al., 2018), its embedded metadata is proving to be a valuable resource for heritage studies providing windows into the viewpoints, responses and beliefs around current events, social and technology trends, memes, and natural disasters (Kietzmann et al., 2012). Among the metadata are the tags that people add to photos. In tagging photos, people choose the words they feel best describe what they are

about; these words or tags are known as folksonomies (Al-khalifa & Davis, 2006). Folksonomies convey rich semantic value as they are context-driven and describe the meaning of documents (Al-khalifa & Davis, 2006). When shared with others or regarded in the context of what others have tagged, tags and people begin to take on additional value through network effects (Vander Wal, 2005). Trant (2009) conceptualizes tagging as a process related to users' choice of terminology; folksonomy as the resulting collective vocabulary; and social tagging as a sociotechnical context within which tagging takes place (with a focus on social computing and networks). In addition to tagging photos with user-chosen words, users can participate in tagging through standard or promoted hashtags.

Social media engenders connective memory by serving as a global, virtual, public space where hashtags provide a means for audiences to join national and international discussions and create a single prescriptive discussion (Arceneaux, 2018). Similarly, social media provides a great opportunity to objectively analyze the connective memory via the discourse linked to the posted photos through photo content analysis (de Juan et al., 2020). User-applied hashtags serve to give an identity to a message and can also link the message to a movement or knowledge development to spread ideas, news, or opinions on a particular topic (Bruns & Moe, 2014; Mulyadi & Fitriana, 2018). Research has documented different online initiatives in the form of cultural heritage activism, including hashtag initiatives such as *#metoo* and #United4Heritage as well as Facebook groups, such as *save the place* and *Beautiful buildings and cool places Perth has lost* (Gregory, 2015; Bennett & Strong, 2018; Uimonen, 2020). While some hashtags – for instance, #win or #justsaying – are paratexts — i.e. words or emojis that anchor the essence of the text to the rhetorical situation in the way that headlines do (Hougaard, 2016), a significant subset of all hashtags, including #ShareOurHeritage and # ShareCulture, are used to mark out a specific discursive territory and facilitate the coming together of participants with shared thematic interests (Sauter & Bruns, 2015). Meaning, hashtags can lead to the formation of an "ad hoc public" or public network that develops around the hashtag (Bruns & Burgess, 2011).

Social media have received considerable attention from researchers in risk and crisis communication and management (Kamara, 2016; Rasmussen & Ihlen, 2017). Moreover, it is argued that social media could provide an arena for the formation of cultural discourses in relation to crisis events (Ostertag & Ortiz, 2013; Eriksson, 2018). Further to this, the use of social media

provides a welcome relief from a health disaster like the COVID-19 pandemic (Zhong et al., 2021). In difficult times, social media networks function as potential resources for digital resilience –they make people feel closer and together (Udwan et al., 2020) – contributing to affective affordances, the ability to bring about affects like hope and optimistic ideals for a better future (Twigt, 2018). Accordingly, online discussions about common heritage and identity in difficult times may also have the ability to generate digital resilience as well as digital engagement between different audiences and heritage. In times of COVID-19, the study of different photos shared by the #ShareOurHeritage and #ShareCulture hashtags provide insights into the use of cultural heritage content to get through the global pandemic. The virtual representation of heritage imposes its own conditions on what is being represented (Kalay, 2007).

Cultural heritage topics are a mainstay in social media, as evidenced by the introduction of hashtags, eg. #culturalheritage in 2015 (Chianese et al., 2016), the presence of dialogues about heritage in discussion forums and computer gaming, and the sharing of heritage photos and experiences via social networks (Economou, 2015). These online practices have turned social media platforms into a "collaborative experience: a shared display of memory, taste, history, signifiers of identity, collection, daily life and judgment" (Murray, 2008, p. 149). Digital heritage initiatives offer new circumstances and venues to observe and interpret how heritage communities collectively remember in the digital age (Burkey, 2019). In this context, a wide literature examines how social media provides a community-based platform for communicating (1) users' interaction with cultural heritage in their personal context and in association with collective memory and identity of place and (2) the socially produced meanings and values that people ascribe to heritage (Giaccardi, 2012; Ole & Smith, 2012; Silberman & Purser, 2012).

Memory discourses associated with social media suggest a "new memory ecology" (S. D. Brown & Hoskins, 2010, p. 87) as the act of sharing photos as objects of memory has changed significantly (van Dijck, 2014). The highly mediated memory of today (Hoskins, 2011) shifts memory from a collective form to a connective form. Connective memory not only involves the individual and the collective, the private and the public, but also past and future into a permanent stream in the visual present (Hoskins, 2009). Connective memory communities communicate the dynamic expression of contemporary identity and represent changes that occur through time to values associate with heritage attributes (Silberman & Purser, 2012).

The discussion about digital photo sharing, online communities, and heritage urges the need to differentiate between the digitization and digitalization of cultural heritage. The different conceptualizations of online heritage practices discussed in this section relate to the process of heritage digitalization. While digitization is the process of moving from physical to digital by converting tangible or intangible heritage attributes to digital (Roussou, 2002). Digitalization, on the other hand, is the continuing transformation of contemporary society and the restructuring of social life around digital communication and media infrastructures and involves many aspects of daily practices (Brennen & Kreiss, 2016; Reis et al., 2020). It refers to the use of digital technologies to create and produce value in new ways to ensure co-production instead of re-production (Lember, 2017; Gobble, 2018). The digitalization of cultural heritage is a social and technical phenomenon in its very nature (Musik & Bogner, 2019); it includes the social practices and cultural values associated with the development, implementation, and use of digital technology while at the same time incorporating aspects of how the social and cultural are formed by the digital manifestations of technology (Musik & Bogner, 2019). Accordingly, the digitalization of cultural heritage has the potential to capture evolving practices in society in order to track the influence of COVID-19 on the co-production of heritage values.

3. Materials and Method

To explore how people value cultural heritage during the COVID-19 pandemic, we examine a COVID-19-related hashtag on the Instagram platform that was launched by UNESCO on the 9th of April 2020 and promoted on a global scale (UNESCO, 2020b). To conduct the empirical study, data for #ShareOurHeritage and #ShareCulture hashtags were collected during the period 9 April-12 August 2020, extracting a dataset of 4,465 photos on Instagram for #ShareOurHeritage and 7,673 photos for #ShareCulture for a total of 12,138 posts. We also collected data for the period 9 April-12 August 2019, extracting a dataset of 75 photos on Instagram for #ShareOurHeritage and 630 photos for #ShareCulture for a total of 705 posts. Two distinct stages of data processing were required: (1) data collection and pre-processing; and (2) data processing comprising two further steps — the processing of geographical data and the analysis of the photos' tags.

3.1 Data collection and pre-processing

We used Webharvy, a web data crawling software, to retrieve Instagram photos and all embedded metadata, including the geographical location, date, hashtags, and users' names. An ethical approach to social media research is grounded on preventing harm to the research subjects and protecting their privacy (Locatelli, 2020). Accordingly, to maintain the anonymity of Instagram users, each was given a number prefixed by *User*. Moreover, some of the Instagram users were contacted and they gave their consent to include their posted photos, and some wanted to include their names, in the results section. While web crawling gives researchers control over the data acquisition process, researchers have to assess the public nature of the original data source while respecting the site users and adhering to the terms of service and privacy policy of the social media platform (Townsend & Wallace, 2016; Breuer et al., 2020). Our study scrapes data from a public hashtag community that is initiated by UNESCO and that consists of public Instagram accounts involved in a public discussion in which they broadcast their thoughts using a hashtag. Hence, to mitigate any ethical issues, the researchers contacted UNESCO's culture sector explaining the nature of this study and obtained informed consent to publish its findings.

The first step of data pre-processing consisted of removing repeated posts. Posts from the same user posted on the same day were combined into one to prevent the final results from being dominated by one user. The number of posts per user per day ranges from 1 to 15. Moreover, in R-Studio (R Core Team, 2020), we identified the intersection of both hashtags using the intersect function in the dplyr package to remove duplicate data. As a result, the number of analyzed posts was reduced to 5,854 for the 2020 dataset and to 568 posts for the pre-COVID-19 period. Afterwards, we preprocessed the textual data by removing stop words and other elements that don't have any impact on semantic meaning, including mentions, URLs, emojis, numbers, and punctuations. Subsequently, we used the textcat package (Hornik et al., 2013) to specify the language of posts and the maps package (Deckmyn, 2018) to identify the location of posts that are missing geographical reference. The maps package extracts the location from the tags, for instance in this tag: "Vizhdarvan is one of the most beautiful valleys in #Ilam_Province Iran 20km away from Ilam city, and close to the village of #Malekshahi", the package identifies Iran as the location of the post. Then we used the rworldmap package (South, 2011) to map the geographical distribution of posts at the country level (Figure 2). Overall, in the 2020 dataset, 140 countries

were identified along with 48 different languages. The number of posts per country ranges from 1 to 1,144 and the frequency of languages from 1 to 2,686 with English, Italian, Spanish, Portuguese, German, Indonesian, and French being, successively, the most frequent languages in the dataset. In the 2019 dataset, 51 countries were identified along with 20 languages. Whereas the number of posts per country ranges from 1 to 90 and the frequency of languages from 1 to 305. An Excel translation tool was employed to translate all the posts into English.

3.2 Data processing

Posts were analyzed using R-Studio software. The comprehensive quantitative and qualitative analysis of tags comprises two stages: (1) the unsupervised classification of tags to identify distinct topics in the dataset and (2) the sentiment analysis.

3.2.1 Topic Modeling

In order to perform topic modeling on the translated Instagram posts, we used (LDA), the most widely used topic modeling algorithm (Kapoor et al., 2018; Wolff et al., 2020). To estimate the optimal quantity of topics, we applied the ldatuning package (Nikita & Chaney, 2016) which calculates four different metrics relative to the document-term matrix of the Instagram posts corpus in order to identify a preferable number of topics for the LDA model.

Since the 2020 and 2019 datasets have drastically different sample sizes, we feel that a comparison of topic modeling results from Pre- and Post-COVID-19 posts may be spurious. Accordingly, we explored the results of topic modeling on the 2020 dataset alone, carrying out a grid search over the number of topics from 5 up to 20. Results showed that the optimal number of topics is 8. We then used the LDA function from the topicmodels package (Grün & Hornik, 2011), to create an eight-topic LDA model for the 2020 datasets. We applied Gibbs's sampling (Lynch, 2007) to estimate the parameters and inference. Afterwards, we plotted the model in a two-dimensional plane to visualize each topic's overall prevalence and the distance between topics; the size of a topic circle represents the relevance of the topic within the Instagram posts, and each topic is associated with terms related to it. In the two-dimensional space, the distance between the circles' centers is a measure of the similarity of the topics: the most closely related topics have the shortest distance. This method allows topics to overlap each other in terms of content, rather than being separated into discrete groups, in a way that mirrors the typical use of natural language (Wolff et al., 2020). This tool allows us to grasp the meaning of each topic, to determine the

prevalence of each topic in the Instagram posts, and to infer the similarity link between each of the obtained topics. Finally, we identified the most relevant terms for each topic. In this reading of results, we differentiated between cognitive terms, related to thoughts and fact-based understanding of a heritage asset (i.e. well maintained, historic, social, resilient art, and natural); and affective terms, reflecting experiential perspectives and feelings about a heritage asset (i.e. exciting, inspiring, peaceful, outstanding, and happy) to extract (1) how the hashtag community engages with heritage, with global lockdown restrictions, in a digitally-mediated environment; and (2) how collective semantics and shared values among members of the hashtag community are co-created. To avoid bias in the identification of affective terms, we referred to the NRC emotion lexicon (Mohammad, 2010; Mohammad & Turney, 2013). It should be stressed that the LDA topic model is not employed as automatic text analysis of the socio-cultural phenomenon under investigation, but rather as a lens through which researchers can approach the data without bias and at a different scale (Mohr & Bogdanov, 2013). Here, the locus of subjectivity is shifted in the methodological framework over to the "post-modeling phase of the analysis" as interpretation is mainly built from the perspective of "the actual modeling of the data" (Mohr & Bogdanov, 2013, p. 560).

3.2.2 Sentiment Analysis (SA)

To allow more in-depth identification of Instagram users' psychological status from affective expressions and attitude toward sharing cultural heritage content in the time of COVID-19, we conduct an automatic sentiment analysis using the syuzhet package in R (Jockers, 2015). This analysis not only identifies "positive" and "negative" emotional expressions but also detects specific emotions, including trust, surprise, sadness, joy, fear, disgust, anticipation, and anger.

4. Results

4.1 Geographical locations of posts

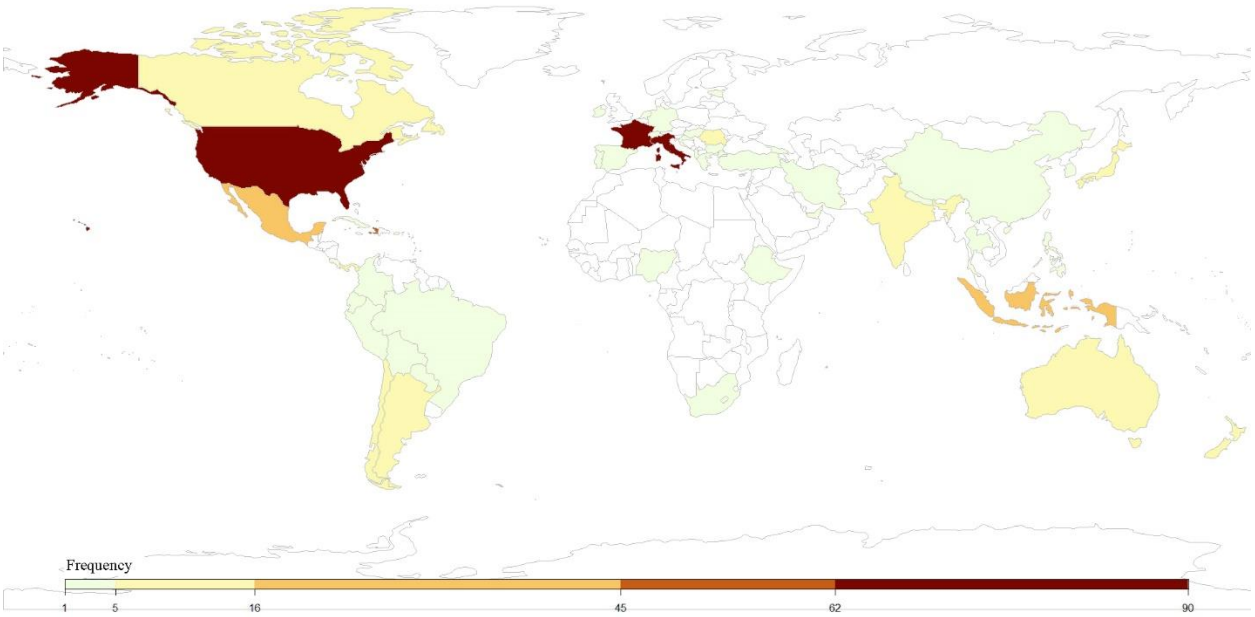

Figure 2. Frequency of posts by country for #ShareOurHeritage and #ShareCulture in 2019.

Our results showed that #ShareOurHeritage was not a circulating hashtag before the UNESCO campaign, whereas the #ShareCulture was used by around 210 people of which the majority used the hashtag only once or twice. The few posts shared in 2019 are concentrated in Italy followed by the USA, France, Haiti, Indonesia, and Mexico (Figure 2). The frequency of posts per country ranges from 1 to 90, while the majority of countries have less than 5 posts in total. That being said, the data indicates that the UNESCO campaign activated a discussion, at a global level, about sharing cultural heritage content during the COVID-19 pandemic.

The distribution of posts during the COVID-19 period shows that most of the posts under the #ShareOurHeritage and #ShareCulture hashtags are concentrated in Italy followed by Indonesia, Germany, Iran, Haiti, Spain, Armenia, India, the USA, Brazil, Portugal, and Mexico (Figure 3). According to the COVID-19 Government Response Tracker, all of these countries had a high response Stringency Index and went through a phase of complete lockdown between April

and August (WHO, 2020). For instance, on the national level, Italy was in lockdown from 09-03-2020 to 18-05-2020, Germany from 23-03-2020 to 20-04-2020, Iran from 14-03-2020 to 20-04-2020, and eight States within the USA were on lockdown for periods ranging between 20 and 271 days (Wikipedia, 2021). Indonesia introduced a stay-at-home order and large-scale social restrictions on 10 April 2020. Figure 3 shows that there are few contributions from African countries, Eastern Europe, Russia, the Arab States, and the Western Pacific.

This result could be linked to different factors. First, it can be linked to the distribution of UNESCO's World Heritage Sites. For instance, there are about 51 heritage sites in Italy — which is the highest number in the world – 45 in Spain, 43 in France, and 41 in Germany, and only 142 sites on the whole continent of Africa (UNESCO, 2020a). On the other hand, the result could also be linked to the digital divide – the differential access and use of information and communication technologies (ICT) – that represents an obstacle to the information society (Goncalves et al., 2018). Access in the information and network society is not limited to physical access, i.e. possession of a computer and network connection, but is rather a process of technology appropriation that combines social, cultural, and technological factors going beyond the physical to also include motivational access, skills, and usage access (van Dijk, 2006). Furthermore, the digital divide is not only associated with consumption and participation but also with production of online content. Schradie (2011) argued that elite voices dominate the digital production challenging theories of an egalitarian digital public sphere. In this context, many scholars have investigated the global-level digital divide (Cruz-Jesus et al., 2016), concluding that digital imbalances reflect the social and economic disparities between Member States and that the diffusion of these technologies has been slower in developing countries.

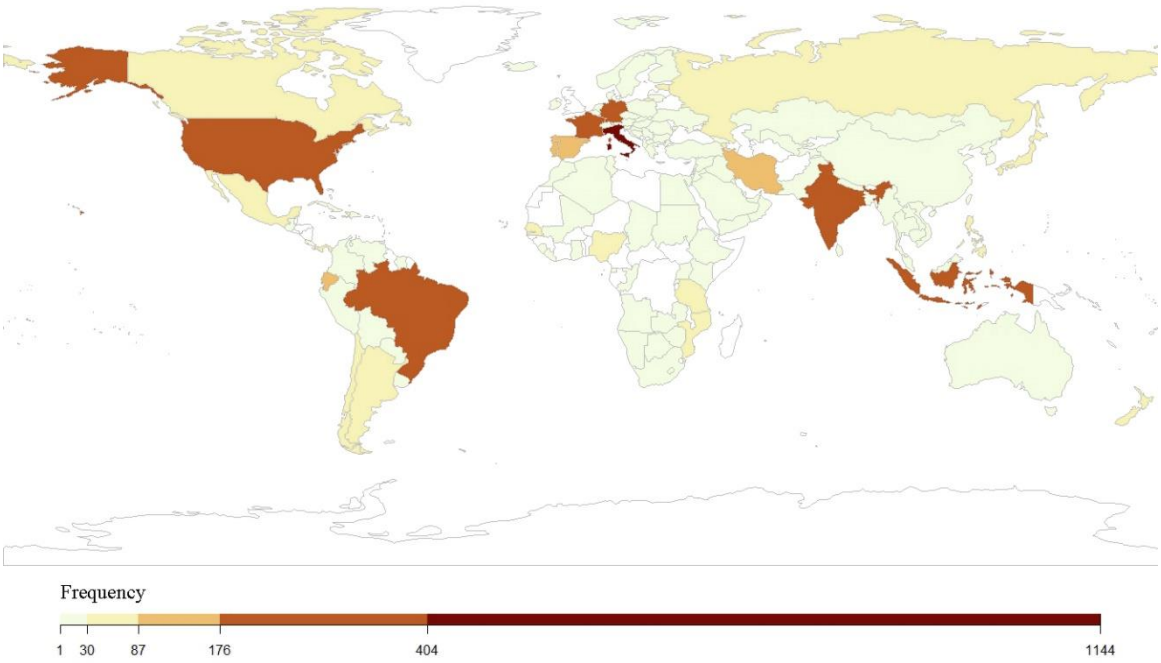

Figure 3. Frequency of posts by country for #ShareOurHeritage and #ShareCulture in 2020.

4.2 Topics Model

Figure 4 visualizes the topic modeling results. The model consists of two clusters and three unique topics. The first cluster includes the three most dominant topics comprising 39% of Instagram posts. The first topic relates to sharing valued World Heritage tangible assets like castles, cathedrals, and other historical monuments, whereas the second topic is related to cultural diversity and resilience in times of COVID-19. The third topic is focused on fulfilling cultural needs while in quarantine — centered on visiting museums virtually from home, sharing content, and looking back at history to have hope and be inspired. These three topics are correlated with the terms "heritage", "history", "century", "social", "hope", "great", and "media" among others. The second cluster includes the fourth and fifth topics that are strongly correlated through the hashtag #stayathome and the terms "home", "visit", "online", "culture", and "story". This cluster is related to remembering from home the places visited before the lockdown by sharing photos of past visits or through online tourism and exhibitions of heritage sites. The sixth and seventh topics are equidistant to the first cluster. The sixth topic relates to staying healthy and activities during lockdown including dancing, painting, and home yoga, whereas the seventh topic relates to positive vibes and the imagination of a better future after COVID-19. The eighth topic, relating to family time, is closest to the sixth topic (activities) but is at quite a distance from the other topics.

To be able to formulate a better understanding of how users value cultural heritage, we identify the representative cognitive and affective terms within each topic (Table 1). The cognitive and affective dimensions of online shared cultural heritage serve as well to contextualize the nature of the digital encounter with heritage.

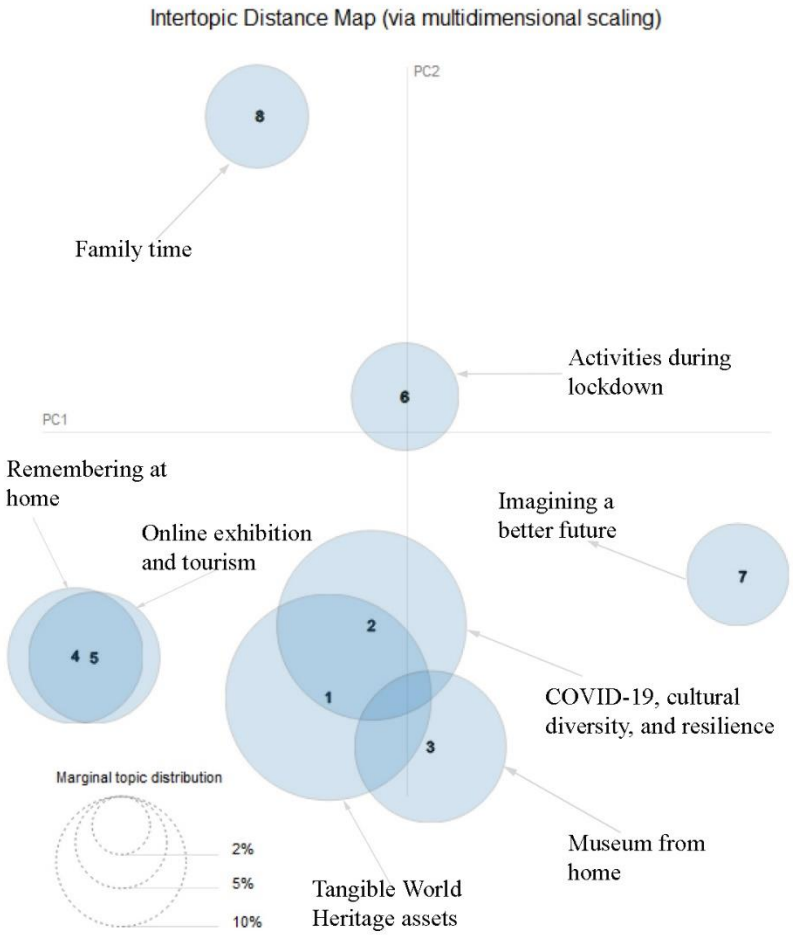

Figure 4. 2D visualization of topics model.

Table 1. Top cognitive and affective terms in the different #ShareOurHeitage and #ShareCulture topics.

Topic	Representative Terms	
	Cognitive Terms	Affective Terms
1	World Heritage, old, century, travel, park, heritage, architecture, built, cathedral, landscape, natural, castle, ancient, historic, monument, national, archeological, famous, #traveltomorrow, media	unique, special, beautiful, proud, outstanding, magnificent, exceptional, famous, hope, great
2	cultural, heritage, art, COVID-19, people, international, social, pandemic, community, dialogue, sharing, knowledge, media, future, sustainable	diversity, resilience, together, celebrate, crisis, creativity, united, peace, power, celebration, #culturaldiversity, humanity, great, opportunity, hope, living, happy, awareness, identity
3	#museumweek, museum, #stayhome, #museumsfromhome, #museumsforculture, culture, history, heroes, technology, social, memory, lockdown, digital, century, media, heritage	togetherness, #staysafe, dream, hope, thankful, great, beautiful, adventure
4	home, #stayathome, nature, culture, masterpiece, quarantine, friends, books, read, remember, #picoftheday, story, masterpieces, #emptymuseum, #travelphotography, #unescoheritage, online	beauty, intangible, rich, good, amazing, enjoy, god, best, wonderful, powerful, admiring, innovation, exciting
5	heritage, culture, online, home, exhibition, children, temple, learn, tourism, #shareknowledge, participate, drawings, #stayathome, story, #noheritagenofuture	#stayhomestaysafe, inspired, gratitude, interesting, happy
6	health, dance, culture heritage, museum, folklore, traditional, #homeyoga, #publichealth, cultural exchange, activities	enjoy, imagination, excited, emotions, love
7	year, place, life, future, people, experience, contemporary, narrative, old	better, human, explore, imagine, believe, participation, good, magic, empowerment, touching, #staysafe, creativity, death, favorite
8	life, women, home, works, space, time, discover, family, food, school, play, writing, song, reality, man, mother	love, passion, creative, resilient, living, memory, warm

As displayed in Table 1, the discussion about cultural heritage begins in the first topic with a focus on tangible elements such as the built landscape and architecture, but it then extends to capture the intangible aspects of heritage present in the human collective such as social values like safety, diversity, togetherness, inclusion, participation, international community, storytelling, sharing knowledge; as well as different cultural expressions and activities like music, dancing, and yoga

among others. It is not surprising that the investigated community group approaches the virtual space as a substitute for the loss of their physical place through hashtags like #traveltomorrow, #stayhome, and #stayhomestaysafe:

> User2433- "We are exploring the beautiful #Dalarna region in Sweden […] Travel virtually with World Heritage Journeys […] Add it to your post-quarantine holiday wish list […] #stayhome #traveltomorrow […]".

> User2228- "We are taking a (virtual) city break to #Bruges this weekend […] #stayhome #traveltomorrow #togetherintravel."

> User2587- "The Margravial Opera House is the best-preserved example of a free-standing Baroque court theater […] As a unique monument of 18th-century festival and music culture it what inscribed by UNESCO[…] # dreamnowtravellater #inspiringplace #discovergermanyfromhome […]".

Within the different discussed topics, members of this hashtag community also shared their emotions. Interestingly, tags are dominated by positive emotional language and socially engaging terms even though the sharing of posts is occurring in difficult times. For instance, the second topic, primarily focused on COVID-19 and the global pandemic, simultaneously encompasses the affective terms of creativity, peace, power, resilience, strength, positivity, celebration, and awareness:

> User1487- "Culture strengthens our endurance and gives us hope […] culture reminds us that we are not alone and sharing it with each other is a message of love and courage. The Mona Lisa is staying at home, and you? To fight # COVID19, there's one thing we all can do […] #stayhomesavelives #UNESCO #culture #Art #MonaLisa #LaGioconda".

Moreover, members of the hashtag community expressed their emotions in the fourth and fifth topics that recall past experiences and virtual tours:

> User461- "Photo from 2017, if asked what is the most memorable traveling experience […] of course I will reveal one by one […] which area made me happy. How lucky I've been to explore some areas and to share my stories" (Figure 5).

> User124- "Give me ♡ if you miss those afternoons with that special someone […] #WorldHeritage # united4heritage […] Beyond COVID #stayathome #keeptakingcareofyou […]" (Figure 6).

User487- “Imaginary Heritage Travels […] decided to go on an imaginary journey. He imagines that his friends […] have come with him. On this imaginary journey, they went to Bojnourd city #Iran #children #childhood” (Figure 7).

Figure 5. User461, 2020, June 18. Permission has been granted.

Figure 6. User 124, 2020, July 29. Permission has been granted. Photo by Campus Central de Ciudad Universitaria UNAM / Abel Zúñiga

Figure 7. User487, 2020, June 13.

The different cultural expressions from home were also associated with affective expressions like enjoy, inspiration, excited, and emotions. Cultural expressions are conveyed through cultural activities, such as drawing, artwork recreation, and cooking:

User 743- “Hi, I'm […] 8years old […] I drew Masooleh, one of the historic village in Iran, that’s listed by Unesco World Heritage Site […] Masooleh […] is one of the most beautiful forest parks in Iran […] #stayhome” (Figure 8).

User4247- “[…] #painting #inspiration #reconstitution #recreation #isolationcreation #museumsonline #confinementcreatif #stayathomechallenge #artinquarantine […]” (Figure 9).

User 4818- “In Wales […] we enjoy a Roast Dinner every Sunday, what are your weekly […] #bringingyoucloser #sharingiscaring #dine #food #family #inspiringchange #closertoyourroots […] #traditions #lovefood #learning #sharingknowledge […]”.

Figure 8. User 743, 2020, May 17.

Figure 9. User 4247, 2020, May 27. Permission has been granted. Photo by Marie-Caroline Behue.

4.3 Sentiment Analysis

The sentiment analysis gives insights into the psychological status of the hashtag community. Figure 10 shows that the majority of posts are associated with positive emotional expressions. The dominant sentiment is trust followed by joy and anticipation. The most used affective terms by the hashtag community to express joy and trust are "resilience" (freq. 526), "love" (freq. 418), "diversity" (freq. 407), "togetherness" (freq. 409), "enjoy" (freq. 224), "#staysafe"/"safe" (freq. 218), "united" (freq. 172), and "humanity" (freq. 115)[1] among others. It can be inferred that social media is called to play a role in bringing people together and ensuring diversity. Experiencing emotions induces a tendency to share them with others, causing them to experience these emotions too (Rimé, 2009), thus giving rise to collective emotions with often profound impacts on society at large (Pellert et al., 2020). Hence, within the investigated Instagram community, members' emotional responses to sharing cultural heritage content in time of COVID-19 might strengthen the shared meaning of the collective event. It can also be claimed that during mass confinement the sharing of cultural heritage is associated with positivity, trust, and joy.

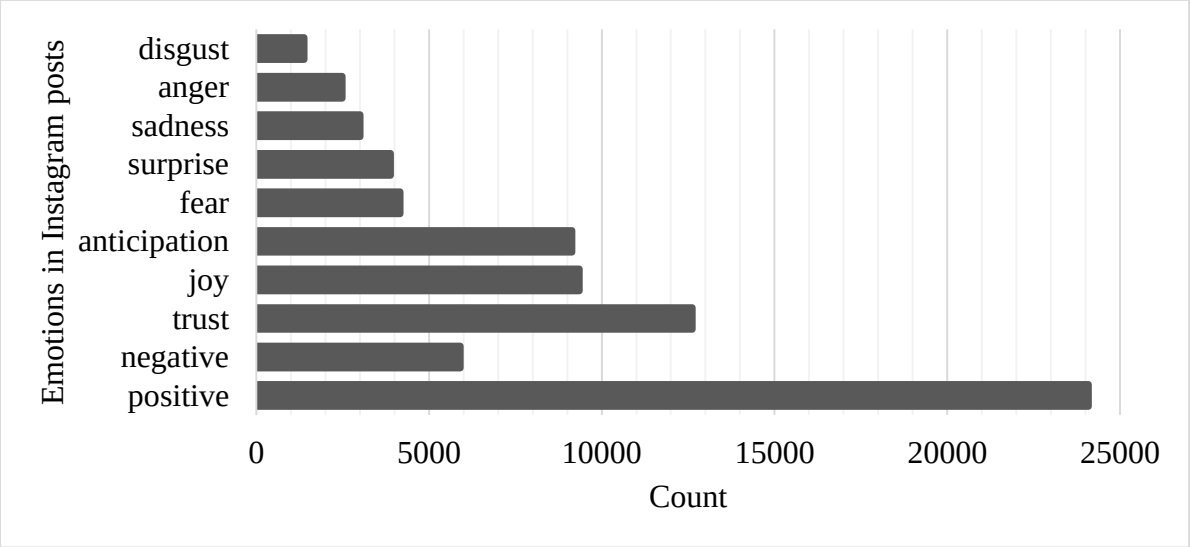

Figure 10. Distribution of emotions in the #ShareOurHeritage #ShareCulture Instagram posts.

[1] Note: freq.= Frequency

Even though Instagram users mainly expressed positive feelings and joy, they had mixed emotions when it came to imagining a better future (topic 7), visiting museums from home (topic 4), and remembering at home (topic 3). The most frequent cognitive negative expressions are "pandemic" (freq. 278) and "quarantine" (freq. 261). The less prevalent affective negative expressions are mainly associated with topics 3, 4, 7, and 8. The most frequent affective term used to express fear and sadness are "challenge" (freq. 315), which is mainly associated with topics 4 and 7, "isolation" (freq. 75), and "risky" (freq. 27) which are associated with topic 3, "sad" (freq. 30) and "harm" (freq. 27) which are associated with topic 7, and "worrying" (freq. 19), and "painful" (freq.16) which are associated with topic 8. The negative affective terms were employed in different contexts, for instance when it comes to "challenge", some expressed that staying at home is a challenge and within this group, some described their worries and daily struggles, i.e. "things I crave all day […] I miss Japanese food […] how long we have to wait before we find a cure […] lockdown challenge" (User 2829). Others expressed concerns about the future, i.e. "[…] unable to deal with the challenges the future has in store […]" (User 2710), or challenges cities are facing during the global pandemic such as economic activities. Less frequent terms – appearing less than ten times in the dataset – are equally important and also provide insights into the low emotional levels Instagram users experienced during the pandemic period under study. These emotional implications are expressed in terms like "scared", "panic", "hardship", "hell", "punishment", "regret", "grieve", "helpless", and "misery" among others.

These findings depend on the time period analyzed – April through August 2020 – as lockdown and confinement measures have been, and still are, changing constantly on global and national levels as the pandemic evolves (Hale et al., 2021). A quick observation of whether there was a change in the sentiments recorded during the period under study, shows that the prominent sentiment was positive (Figure. 11). In fact, studies that have investigated COVID-19 and lockdown hashtags so far have observed that social media users expressed only a limited number of negative sentiments. Despite being quarantined or staying at home, users appear hopeful about timely efforts to defeat the pandemic and are grateful for new social experiences with family (Barkur et al., 2020; Bhat et al., 2020).

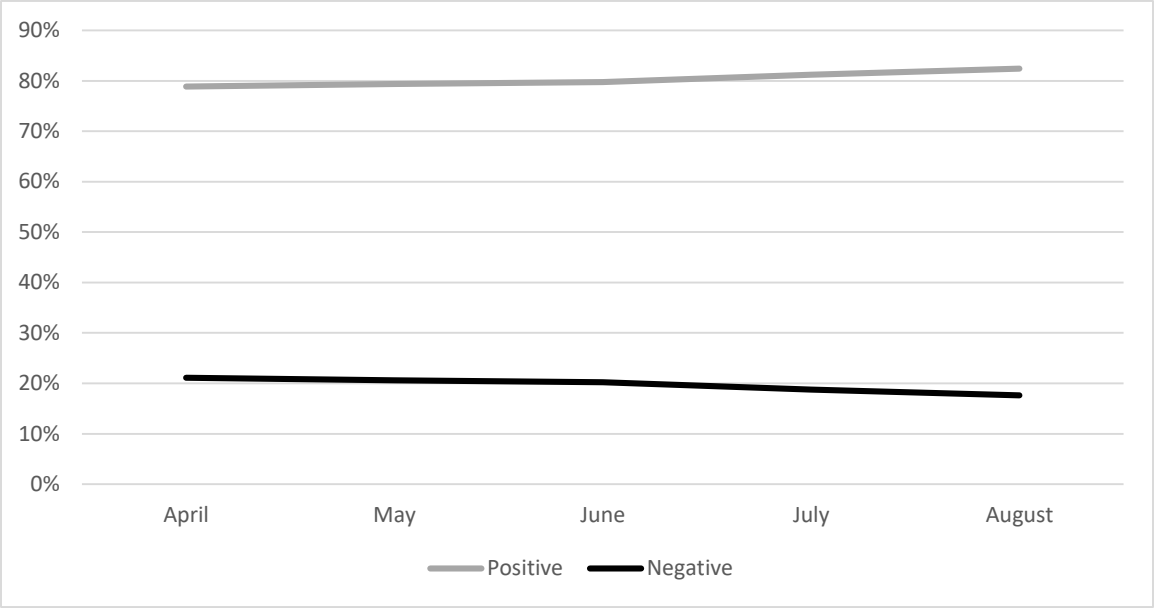

Figure 11. Emotions in the #ShareOurHeritage #ShareCulture Instagram posts between April and August 2020.

There is no doubt that "sharing" cultural heritage content was triggered by the UNESCO campaign and the COVID-19 pandemic as proven by the difference in size between the 2020 and 2019 datasets. As daily-life practices moved online, the COVID-19 crisis was a catalyst for sharing heritage content online, and within this context, the digital platform provided a public virtual space that allowed greater participation and engagement in shaping the online heritage discourse.

The few records obtained from the 2019 dataset show that the most frequent terms used before the pandemic are "travel" (freq. 136), "festival" (freq. 11), "tradition" (freq. 91), "food" (freq. 74), "dance" (freq. 68), "discover", "folklore" (freq. 57), "tourism" (freq.57), and "adventure" (freq. 40). Sharing travel and food photos on social media while on vacation is a common trend among users and many scholars have investigated this online practice (Kang & Schuett, 2013; Wong et al., 2019). In 2020, the 2019 terms were replaced with #StayHome, #StayHomeTravelTomorrow, #StaySafe, #culturaldiversity, and #MuseumFromHome among others.

Moreover, results show that even though the campaign was promoted by UNESCO with language and examples focused on "world heritage properties", the manifest online heritage discourse was not solely centered on tangible heritage assets. Members of the investigated hashtag community shared knowledge, memories of events and places, and personal thoughts and feelings to fulfill their cultural interaction needs and keep their memories of cultural heritage places alive. During the pandemic, the experiential dimension of heritage was no longer a product of present visiting experiences or physical encounters with heritage, but an outcome of sharing photos with others. The heightened need to share memories or educational insights or, in some cases, imaginative travels was fulfilled by social media platforms. This practice of sharing allows a form of meaning transmission and continuity. Within this context, the online shared photos play a role in the creation of the collective based on narratives, memories, daily practices, and cultural activities while in quarantine. The hashtag community provides a new medium for the construction of continuous memory communities that represent the changes that occur through time to how heritage assets are valued. The shared tags reflect the dynamic expression of contemporary identity, sense-making, and collective meaning. The knowledge gained from this analysis can support the conservation and management of heritage which is dependent on ascribed cultural values representing the diversity of interpretations.

5. Discussion and Conclusion

The COVID-19 pandemic introduced a widespread compulsive digital transformation in society. As different cultural sectors adapted to the change, people also sought to create and even virtually re-create experiences and perceptions of heritage within their new digitized practices. By conceptualizing digitally mediated heritage practices – in our case the *sharing* of heritage content – as a process of heritage value co-creation, this study contributes to the existing body of knowledge both theoretically and methodologically.

When framing the theoretical contributions of this work, it is important to emphasize that COVID-19 was not a variable within the study, but a context for the study. The lack of a significant number of posts to the studied hashtags of #ShareOurHeritage and #ShareCulture prior to the pandemic serves simultaneously to explain why a comparative study was not possible and highlight the scale of the digital transformation. The wide-scale participation in the hashtag call,

promoted by UNESCO against the backdrop of COVID-19 lock-down policies, allowed for the application of machine learning tools that would not otherwise be possible.

By eliciting the cognitive, affective, and emotional expressions associated with sharing cultural heritage during a specific phase within the COVID-19 pandemic, our results highlight the social value of heritage through terms like resilience, creativity, empowerment, togetherness, union, love, experience, as well as memory, nostalgia for the past, and hope for the future. As pre-defined typologies of heritage values have been widely criticized and scholars have been arguing for bottom-up context-driven understandings of heritage values, this study applied a bottom-up, inductive, data-driven approach that revealed a diversity of interactions within the digitally mediated environment. These interactions, in turn, feed the co-creation of heritage values – for some the digitally mediated space served to digitize established, normative views of heritage (e.g. via virtual trips to designated heritage sites) while for others it was a space to share activities on the theme of heritage (e.g. dancing, playing, and cooking). While a first assessment might be to view these results along the recurrent themes of tangible and intangible heritage, that would be too crude. The sharing of activities is not simply a commentary on intangible heritage practices, but rather the co-creation of new digitally-mediated, boundary-spanning activities shared as part of the lockdown experience. In a sense, this study points to the new theoretical concept of virtual heritage – heritage activities (e.g. dancing) and values surrounding those activities (e.g. resilience) that are fully co-created within the digital realm.

Indeed, uncovering the heritage values of the virtual realm itself requires the use of computer-assisted analysis – namely topic modeling techniques. These techniques enable a comprehensive understanding of the social value of heritage. The method employed in this work is transferable and can be employed to assess data from other social media platforms. The use of LDA and sentiment analysis can contribute to the online discourse of cultural heritage during later phases of and after the pandemic. The application of the same methodology to conduct a longitudinal analysis will support learning about changing and emerging cultural values among different online communities. Social media data analysis allows comprehensive documentation and interpretation of the co-construction processes of heritage values over time and across different platforms. Within the context of our investigation, Instagram can serve as a longitudinal record of how values change or don't after the crisis. The value of this record is manifold – first, the virtual

heritage co-created within this digitally mediated space can be preserved and shared; second, heritage virtual tours can be designed to meld both normative and co-created heritage values; third, the physical management of heritage sites can be enhanced by associating the digitally manifest meanings to effectively communicate cultural values to audiences through interactive cognitive-emotional experiences.

While having the power to mine the social media space as a means to promote better communication of heritage values within the built environment may feel very inclusive, some caution is recommended. As new technologies have been advocated as tools to ensure inclusion and diversity in the cultural heritage sector in terms of access, interpretation, and co-production, digitally mediated heritage has yet to fulfill its promises. As museums and heritage sites turned to online activities in order to weather the COVID-19 pandemic, the differences in individual information technology literacy across varying demographic and socioeconomic groups continues to emerge as an important factor for the inclusive dissemination of cultural heritage content. Our research highlights, through the geographic distribution of the hashtag call participation that there are existing digital gaps hindering participation.

On the other hand, of those that did participate, the digital technology served to bring together a community of people seeking to find hope and a better tomorrow in the midst of crisis. Recognizing the importance of this optimism along with the implications for including only certain views in collective definitions of heritage, the digital divide should be addressed. The production and consumption of heritage content should not exclude certain groups.

Cultural heritage is a social construct that changes over time and space in response to different social, economic, and cultural processes among others. The digitization of cultural heritage improves its capacity for continuity and adaptation to change over time as new heritage values emerge.

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