



Cultural (un)employment in COVID-19 times using the Global Datasets of Events Location and Tone

HIGHLIGHTS

- The Cultural and Creative Sectors (CCS) have been among the first to be negatively affected by the COVID-19 pandemic. Venue-based sub-sectors such as the performing arts were severely hit. Also, the crisis has highlighted the very vulnerable position of many non-standard cultural workers, such as freelancers or temporary workers.
- We find that the (un)employment topic became much more popular with the outspread of the pandemic, while the popularity of culture-related topics considerably decreased.
- Using the Global Dataset of Events, Location, and Tone (GDELT), we analyse the effect of the COVID-19 pandemic on the media coverage of the 'cultural (un)employment' topic across Europe along two dimensions: article quantity (or popularity) and sentiment.
- On the contrary, both topics register a big drop when it comes to the articles' tone.
- The general concern generated by the pandemic towards the sustainability of CCS, as proxied by the negative tone of the news under analysis, has pushed some EU Member States to design *ad hoc* policy measures to support artistic careers.

'The 'speed of recovery' of the tone of articles dealing with the cultural (un)employment topic is similar to the one observed for the popularity indicator. The tone indeed goes up after the first wave of pandemic - quickly for the (un)-employment topic and more gradually for culture-related news.'

INTRODUCTION

The COVID-19 pandemic has badly hit the Cultural and Creative Sectors (CCS). From 2019 to 2020, cultural employment in the EU fell by 3 % compared with 1.3 % for total employment. In particular, the number of people

employed in creative, artistic and entertainment jobs in the EU felt dramatically (over -100 000, meaning -10%) (source: Eurostat). Accounts of these impacts quickly make their way online in the form of electronic news stories, which represent the main source of information about world events for many citizens. Undeniably, media coverage of topics influences the perceived importance of these topics.

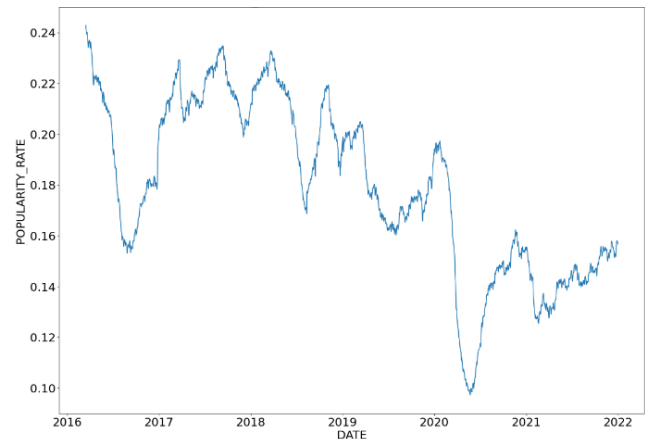
The particularly bad impact that the pandemic had in this domain is due to the specific working conditions in CCS (i.e. project-based work and discontinuity of employment is the rule). In the EU, about one-third of the cultural workers are self-employed, compared with an average of 14 % in the whole economy (source: Eurostat). Yet, it remains unclear whether the specific impact that the pandemic had on CCS was sufficiently present in the public debate. We argue that improved collective awareness towards the specific needs of these sectors is important to build political consensus for the introduction of specific policy instruments to make CCS more sustainable, such as special kinds of unemployment benefit schemes for non-working periods of artists and cultural professionals as a response to the specificities of CCS and related professions.

In this brief, we utilise a freely available dataset called the Global Dataset of Events, Location, and Tone (GDEL)¹, an open, big data platform of meta-information extracted from broadcast, print, and web news collected worldwide and translated nearly in real-time into English from over 65 different languages. Extracted and processed information are stored in different databases, with the most comprehensive one being the GDEL Global Knowledge Graph (GKG). GDEL GKG provides information on people, locations and organizations mentioned in the text of the article and retrieves counts, quotes, images and themes using a number of popular topical taxonomies. For our analysis, leveraging on natural language processing and on an ad-hoc Elasticsearch² infrastructure, we use the GKG themes to filter out news related to our topics of interest (see Quick Guide). We extract all the metadata on news published every day over the past 7 years (2016-2022). To reduce 'noise' in the results, we skip articles having less than 500 words and include only the journal outlets that are present within the entire period of extraction, from the start to the end. With this set of selected news, first, we analyse the effect of the COVID-19 pandemic on the media coverage of the 'cultural (un)employment' topic across 28 European countries (27 Member States plus UK) along two dimensions: article quantity (or popularity) and sentiment. Second, we refine the analysis by focusing on connected topics that may drive the observed results, such as a general concern (or negative sentiment) towards unemployment in the overall economy.

Popularity: prompt vs. delayed media uptake for the (un)employment and culture topics

Figure 1 shows a big drop both in the Popularity Rate of articles dealing with the cultural (un)employment topic at the beginning of the pandemic. In other words, the topic became much less 'popular' with the pandemic outbreak, probably due to the spread of articles focusing on the health emergency.

Figure 1 – Cultural (un)employment: Popularity Rate in the news



Note: The graph displays the Popularity Rate of the news extracted per day on cultural (un)employment, using a 90 days smoothing window. This means that the average number of observations over the 90-day period is weighted by the number of outlets released over the same period. Smoothing is intended to reduce random fluctuations in the data in order to make patterns more visible and to better focus on the trend of the time series.

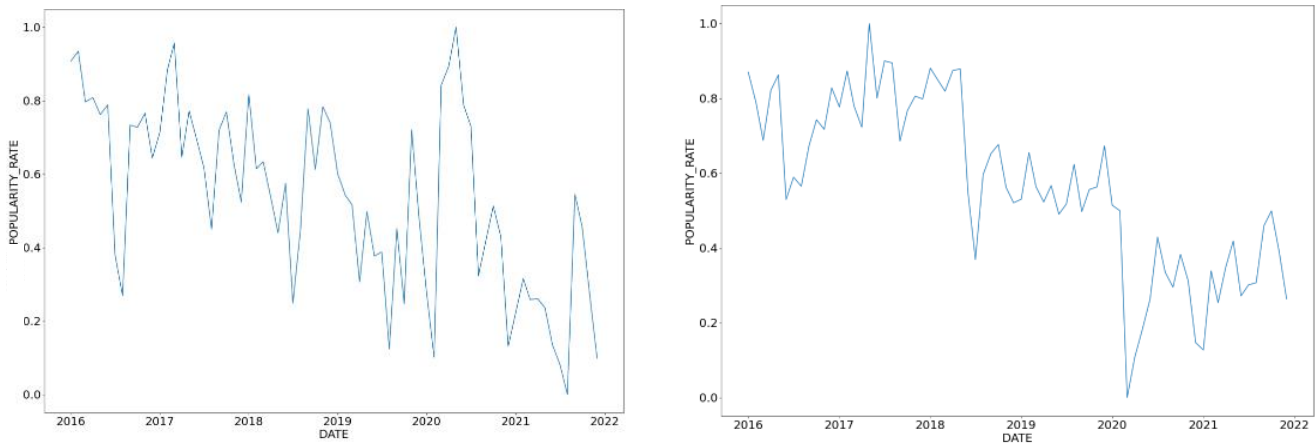
But to what extent do articles capture popularity trends that are specific to the cultural job market? To answer this question, we disaggregate our sample of articles by main sub-topic (by (un)employment, on the one hand, and by culture, on the other, according to the filtered GDEL GKG themes presented in the Quick Guide) and study again their popularity. Figure 2 illustrates the monthly Popularity Rates of the two themes. Interestingly, the two themes follow inverted paths at the beginning of the pandemic: while the effects on the labour market of the pandemic are promptly addressed by press articles, culture is not that much popular and actually the number of articles on culture-related topics sees a significant drop in 2020. This is most likely due to the drastic impact the pandemic had on CCS, with numerous cultural venues closing down and events postponed or cancelled.

Interestingly, though, the popularity of culture-related articles increases again later in 2020 and the following years probably due to the re-openings and perhaps renewed attention to specific working conditions of artists and cultural professionals. Still, the topic has not yet reached the same level of popularity of the pre-pandemic period.

¹ GDEL website: <https://blog.gdelproject.org/>

² <https://www.elastic.co/>

Figure 2 – (Un)employment and culture: Popularity Rate in the news



Note: The graph displays the Popularity Rates of the news extracted per month on *(un)employment*, on the one left, and on *culture*, on the right, using a 90 days smoothing window. This means that the average number of observations over the 90-day period is weighted by the number of outlets released over the same period.

QUICK GUIDE –

The following **GKG themes** have been used to extract metadata on news related to the cultural (un)employment topic:

(UN)EMPLOYMENT	CULTURE
UNEMPLOYMENT	TAX_FNCACT_AUTHOR
WB_2751_LABOR_SUPPLY	TAX_FNCACT_LYRICIST
WB_1170_JOB_CREATION_AND_JOB OPPORTUNITIES	TAX_FNCACT_STUNT_PERFORMER
WB_____JOBS	WB_3009_CULTURAL_SERVICES
WB_2670_JOBS	TAX_FNCACT_ACTOR
WB_2748_EMPLOYMENT	WB_1789_PHYSICAL_AND_CULTURAL_RESOURCES
WB_2750_LABOR_FORCE	TAX_FNCACT_PIANIST
WB_855_LABOR_MARKETS	TAX_FNCACT_DRUMMER
WB_1649_UNEMPLOYMENT_BENEFITS	TAX_FNCACT_ARTISTS
WB_2746_LABOR_PARTICIPATION	TAX_FNCACT_DANCER
WB_2702_UNDEREMPLOYMENT	TAX_FNCACT_SINGERS
ECON_UNDEREMPLOYMENT	TAX_FNCACT_SINGER
WB_2895_EMPLOYMENT_RATE	TAX_FNCACT_ARTIST
WB_2747_UNEMPLOYMENT	TAX_FNCACT_MUSICIAN
	WB_1765_CULTURE_HERITAGE_AND_SUSTAINABLE_TOURISM
	TAX_FNCACT_GUITARIST
	TAX_FNCACT_WRITER

Articles' Tone: score between -1 and +1 expressing whether a certain message conveys a positive or negative sentiment with respect to a certain topic in the text, calculated by GDELT by averaging the tone scores of the terms contained in the text using a sentiment dictionary (Vader).

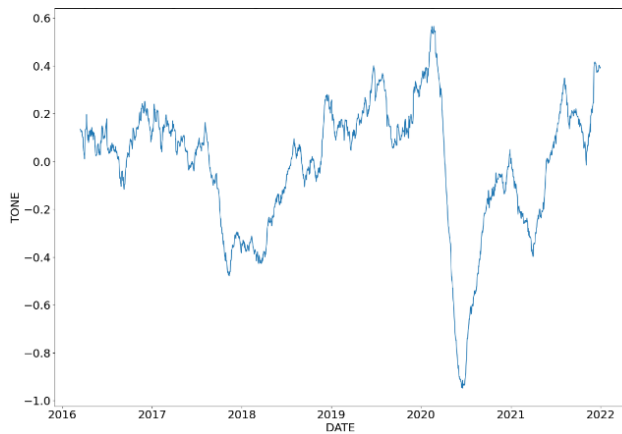
Topic's Popularity Rate: number of articles referred to the searched topic normalized by the total number of available articles in the period.

Sentiment: the negative tone dominates the news

Figure 3 shows a big drop in the tone of articles dealing with the cultural (un)employment topic at the beginning of the pandemic. In other words, this means that the articles started to reflect a more negative sentiment relative to the *cultural (un)employment* theme, very likely due to the bad effect that the pandemic had on (cultural) jobs.

If we now separately analyse the tone of articles dealing with *(un)employment* and *culture*, this time we observe the same trend (Figure 4, reporting the monthly Articles' Tone of the two themes, taken separately). This is different from what observed for the popularity dimension. The articles' negative tone during the first phase of the pandemic could in fact depend on a generalised concern towards (un)employment in the overall economy, but also towards the specific negative impact that the pandemic had on the CCS and cultural professionals.

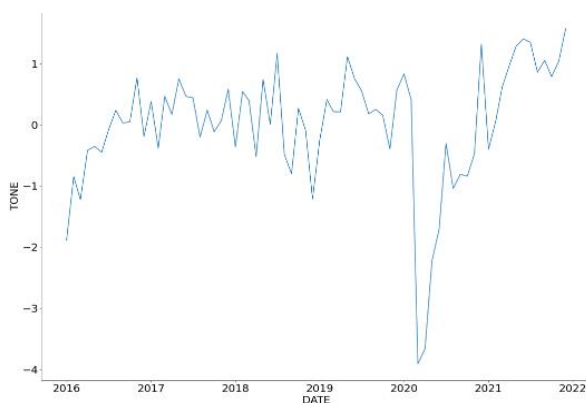
Figure 3 - Cultural (un)employment: Tone in the news



Note: The graph displays the Articles' Tone for the news extracted per day on *cultural (un)employment*, using a 90 days smoothing window. The average number of observations are weighted by the number of outlets released over the same period.

The 'speed of recovery', though, is similar to the one observed for the popularity indicator. The tone indeed goes up again after the first wave of pandemic - quickly for the (un)-employment topic and more gradually for culture-related news. This is probably due to the introduction of the vaccines as well as of support measures for companies and workers, which helped generate collective confidence in a 'post-COVID' future. The fact that the tone recovery is slower for culture-related news may reflect the long-term effects that the pandemic had on the CCS, for which an entire shift to digital endeavors has not been possible for a number of structural (e.g. most activities like performances and exhibitions require 'live' participation) but also contingent (e.g. lack of digital

Figure 4 - (Un)employment and culture: Tone in the news



Note: The graph displays the Articles' Tones of the news extracted per month on *(un)employment*, on the left, and on *culture*, on the right, using a 90 days smoothing window. This means that the average number of observations over the 90-day period is weighted by the number of outlets released over the same period.

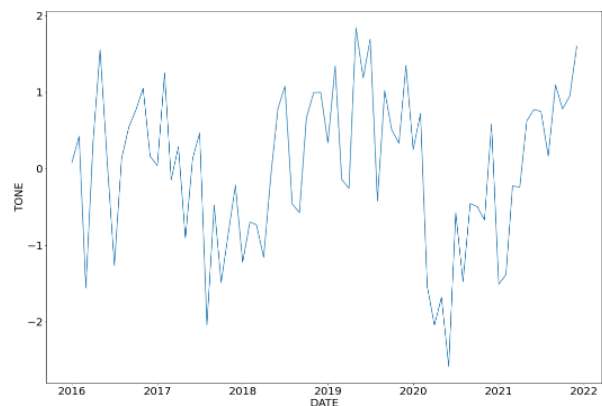
skills and equipment) reasons.

Related and future JRC work

This policy brief has been developed as part of the JRC Socio-economic Tracker Task Force, a new JRC working group aimed at testing experimental methodologies and datasets to obtain policy-relevant evidence. The work presented herein offers novel insights on the potential of GDELT data to study socio-economic phenomena by studying their 'quantitative' and 'qualitative' uptake in the news. Yet, the dataset does contain noise due to the lack of clarity on the data collection criteria used. In particular, it remains unclear why some countries count only a few outlets and extracted news. In our study, this was for instance the case for eight countries (Malta, Cyprus, Belgium, Luxembourg, Latvia, Romania, Denmark, Finland) for which not clear trends could be detected when doing a country-based analysis, most likely due to a scarce coverage of GDELT for those countries.

Interested users are offered the possibility to exploit the presented data by interacting with a Microsoft Power BI dashboard developed by the JRC for various extracted socio-economic aspects, including the discussed cultural (un)employment topic. The dashboard can be publicly accessed by visiting the URL: https://knowledge4policy.ec.europa.eu/composite-indicators/socioeconomic-tracker_en.

All data shown in the dashboard are also freely available to download in CSV format within the JRC Data Catalogue³ at the following permanent location: <https://data.jrc.ec.europa.eu/dataset/f7be47f7-49a2-44e8-9dc8-043735af4139>, and also within the European Data portal⁴, the official data repository for European data, at the



³ <https://data.jrc.ec.europa.eu>

⁴ <https://data.europa.eu/en>

CONTACT INFORMATION

Sergio.Consoli@ec.europa.eu

The European Commission's science and knowledge service

Joint Research Centre

EU Science Hub: ec.europa.eu/jrc

EU Science Hub

EU Science, Research and Innovation

@EU_ScienceHub

EU Science

EU Science Hub - Joint Research Centre

following permanent location:
<http://data.europa.eu/88u/dataset/f7be47f7-49a2-44e8-9dc8-043735af4139>.

In order to explore further the early results presented in this brief, a number of additional research questions are worth addressing, notably: What if we compare our results with news on (un)employment in other sectors less affected by COVID-19 (agriculture? public administration? ...)? Is there any correlation between number of cultural employees / level of cultural expenditure in a country and sentiment detected in the news? What are the topics appearing together in the news? For instance, can network analysis help us identify countries that have initiated reforms compared to those who have not? And, is there any relation between popularity and sentiment indicators and specific measures and reforms introduced in different countries as a response to the pandemic, such as Romania or Italy (where are a new law on the status of the artist (Romania) and unemployment benefits schemes for performing arts workers (Italy) are currently under study)? All these questions represent possible venues of future investigations which could help further test the policy-relevance of GDELT data.

DISCLAIMER OR OTHER FINAL DETAILS

The authors, Sergio Consoli (JRC) and Valentina Montalto (Université Paris 1 Sorbonne, formerly at the JRC), would like to thank the colleagues support of the Competence Centre on Composite Indicators and Scoreboards (COIN) at the Joint Research Centre of the European Commission. The views expressed are purely those of the authors and may not in any circumstance be regarded as stating an official position of the European Commission.

COPYRIGHT

© European Union, 2023

CONTACT INFORMATION

Sergio.Consoli@ec.europa.eu

The European Commission's science and knowledge service

Joint Research Centre

 EU Science Hub: ec.europa.eu/jrc

 EU Science Hub

 EU Science, Research and Innovation

 @EU_ScienceHub

 EU Science

 EU Science Hub - Joint Research Centre