# (initial) Typology of shocks

An event can cause a candidate shock when (1) there is a direct or indirect impact on the socio-ecological system (social capital or environment), (2) it is sudden, and (3) that impact is high. Considering that an event can cause a shock, this one can be classified into one of the five types below based on which subsystem impacts (see below). For instance, the political, economic, and social systems are functionally differentiated subsystems of society (Albert, 2022).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | **Type of shock** | **Impacted subsystem** | | Ecological | Environment | | Technological | | Economic | Economical | | Societal | Social | | Political | Political | |  |

The environmental shocks are disasters that occur in the environment (Didenko & Kulik, 2018). Some of these disasters are caused by natural conditions and are referred as *natural disasters,* severe weather with potential to pose a significant threat to human health and safety, property, critical infrastructure, and homeland security (Homeland Security, 2024). In this project, we will call **ecological shocks** such natural disasters that fulfills the three criteria mentioned above. Some examples are hurricanes, tornados, floods (Atkinson, 2013). These shocks depend on variables like the changes in the volume of CO2 in the environment; greenhouse gas emissions from industries into the environment; emissions of greenhouse gases from agriculture into the environment; changes in global temperature of the planet; freshwater resource reduction; changes in forested area (Didenko & Kulik, 2018).

However human activities also affect the environment, such events are called *technological disaster.* These are commonly studied under environmental contamination (Ritchie & Gill, 2007), meaning a “man-made contamination of an environment that persists over time”(Ritchie & Gill, 2007). Some examples are dam collapses, explosions, and nuclear accidents, which are commonly called *technological catastrophes* (Baum et al., 1983; Manion & Evan, 2002). In this project we will call **technological shocks** these technological disasters that fulfills the three criteria mentioned above.

On the other hand, **economic shocks** are sudden events causing a significant impact on the local economy (economic system), which may not be economic in nature (Besser et al., 2008). For instance, while events like a tornado or the construction of a highway are not considered to be economic in nature, their impact on the economy can be considered shocks.

Following a similar principle, political shocks have been defined as “dramatic change in the international system or its subsystems that fundamentally alters the processes, relationships, and expectations that drive nation-state interaction” (Goertz & Diehl, 1995), or as a “sudden, violent change in a host country’s political or institutional contexts” (Darendeli et al., 2021). In this project, a **political shock** will be any event that causes dramatic changes in the political system of a country. Territorial changes, alterations in international power distribution, civil wars, and national independence are examples of this.

**Societal shocks** are events that impact the societal system, affecting the capacity of societies to maintain their core social functions, mainly through effects on society’s health, and increased social inequalities (Wernli et al., 2021). Examples of societal shocks affecting societies’ health are disease epidemics (Cook et al., 2019), famines (Vågerö et al., 2013), and genocide (Keinan-Boker, 2014). Other events like armed conflicts create spatial inequalities through structural destruction (e.g. demolition of agricultural land, hospitals, markets, roads, schools, etc.), and events of massive international migration also hold the potential for value/normative transformations in society (Portes, 2010). Considering that social changes might be gradual, these events will only be considered as societal shocks if their impact is sudden and elevated, as stated in the three criteria for shock identification.

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**Youtube API**

Tests were conducted to assess the viability of using the YouTube API as a platform for extracting news-related comments from journalistic channels. The results obtained showed feasibility in using the YouTube API for this purpose.

According to the documentation available on the YouTube API website, there are approximately 20 different functions that allow extracting information based on specific user needs. Each of these functions makes API calls. Each call made consumes a specific amount of quotas, which are deducted from a daily total of 10,000 available quotas.

In our case, we need to extract information such as video titles, number of "likes" and "dislikes," IDs, comments, replies to comments, and number of "likes" on comments. Each of these variables is obtained through different functions that consume quotas. Although the documentation specifies that each API call to obtain this information consumes 1 quota, in practice, we have observed that the consumption of quotas is higher. Currently, we have not identified a clear explanation for this. However, we believe it could be because each of the functions used returns multiple pages as a result, which increases costs. Despite this, we have an approximation of how many comments we could obtain and from how many videos.

The extraction of comments from videos is the most complex task, as it requires performing preliminary API calls. We have identified two methods to obtain comments, which are described below.

Method 1: This method involves accessing the channel first, then retrieving a playlist called "Uploads" which provides access to all content uploaded by the channel in chronological order. Subsequently, the IDs of the uploaded content are obtained and iterated over to extract the comments. It is important to note that this method not only extracts comments for videos but also includes comments for "shorts" that are uploaded.

Method 2: This method is similar to Method 1, but here access is made to specific playlists. As shown in Figure 1, some channels like BBC and CNN divide their content into playlists that refer to specific events or topics. This method extracts comments from these specific playlists. In this case, comments for shorts are not extracted.

Interfaz de usuario gráfica, Sitio web

Descripción generada automáticamente

Figura 1. Playlist examples BBC news

Some journalistic channels have a very high number of uploaded content, so we wanted to know how many of these videos could be extracted with method 1. Results are presented in the table below.

|  |  |  |
| --- | --- | --- |
| **Channel** | **Total videos uploaded** | **Total videos extracted** |
| CNN | 164,620 | 19,295 |
| BBC | 21,405 | 17,429 |

As can be seen in the table, we were able to obtain a limited number of channel content IDs. In the case of CNN we were able to obtain the IDs for the last 19,295 uploads. Remember, this includes videos and shorts. We still don't know specifically why we couldn't get access to all the content. We probably need to make modifications to some parameter that we have not yet identified.

From the total content IDs obtained, we extracted the comments for the last 30 CNN uploads and the last 50 BBC uploads before the daily quota ran out (we used two API keys). The results of the comment extraction are shown below.

|  |  |  |
| --- | --- | --- |
| **Channel** | **Total videos analyzed** | **Extracted comments** |
| CNN | 30 | 648,834 |
| BBC | 50 | 414,818 |

*Note: The total number of comments includes main comments to the video and replies to main comments.*

In conclusion, we believe that using the YouTube API to extract comments is feasible. However, it is important to consider the method of extraction, i.e., whether we choose to retrieve them through specific playlists or whether we will extract all comments from all content uploaded by the channel. Each method has its own implications. Method 1 includes shorts and so far we could not access the full content of the channel. Method 2 on the other hand involves manually selecting the playlist from which you want to extract content and may omit videos that the channel owners did not add there.

**Data sources**

|  |  |  |  |
| --- | --- | --- | --- |
| **Social** | | | |
| **Indicator** | **Data Source** | **Archive** | **Extraction** |
| Happiness Index | [World Happiness Report](https://worldhappiness.report/data/) | [2012-2024] | [Manual extraction] |
| Human Development Index | [Human Nations Development Programme](https://hdr.undp.org/data-center/documentation-and-downloads) | [1990-2022] | [Download dataset] |
| Healthcare Access and Quality Index | [Our World in Data](https://ourworldindata.org/grapher/healthcare-access-and-quality-index?time=1990) | [1990-2015] | [Download dataset] |
| Freedom Rates | [Freedom House](https://freedomhouse.org/countries/freedom-world/scores) | [1973-2024] | [Download dataset] |
| Internal displacements | [IDMC](https://www.internal-displacement.org/database/displacement-data/) | [2008-2022] | [Download dataset] |
| **Economic** | | | |
| **Index** | **Data Source** | **Archive** | **Extraction** |
| GDP per Capita | [The World Bank](https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?end=2022&most_recent_year_desc=true&start=1960&view=map&year=1960) | [1960-2022] | [Download dataset] |
| GDP Grow | [The World Bank](https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2022&most_recent_year_desc=true&start=1960&view=map&year=1961) | [1960-2022] | [Download dataset] |
| Inflation | [International Monetary Fund](https://www.imf.org/external/datamapper/PCPIPCH@WEO/WEOWORLD/VEN/COL) | [1980-2024] | [Download dataset] |
| Consumer Price Index | [The World Bank](https://data.worldbank.org/indicator/FP.CPI.TOTL?end=2022&most_recent_year_desc=true&start=1960&view=map&year=1969) | [1960-2022] | [Download dataset] |
| Unemployment Rate | [The World Bank](https://data.worldbank.org/indicator/SL.UEM.TOTL.NE.ZS?end=2022&most_recent_year_desc=true&start=1960&view=map&year=1969) | [1960-2022] | [Download dataset] |
| **Environmental** | | | |
| Death because of air pollution | [Our World in Data](https://ourworldindata.org/air-pollution) | [1990-2019] | [Download dataset] |
| Mean Temperature Change of Meteorological year | [IMF Climate Change](https://climatedata.imf.org/pages/climate-and-weather#cc3) | [1961-2021] | [Download dataset] |
| Monthly Atmospheric Carbon Dioxide Concentrations | [IMF Climate Change](https://climatedata.imf.org/pages/climate-and-weather#cc3) | [1961-2021] | [Download dataset] |
|  |  |  |  |

**Summary of Data Sources**

* The World Bank
* The World Happiness Report
* International Monetary Fund
* Bank for International Settlements
* Human Nations Development Programme
* Our world in data
* Freedom house
* IDMC
* Statista
* IMF climate change

**Methodology Phase 1**

Phase 1 of our methodology focuses on the identification of shocks in news articles. To achieve this objetive, we will follow four main steps, illustrated in Figure 1 and detailed below.

**Figura 1.** Steps associated to Phase 1

Step 1. Extraction of News Articles

The first step consists of extracting news articles. To do so, we will start by creating a lexicon called the Social Resilience Lexicon [SRL], based on CrisisLex, a lexicon of 380 automatically generated and human-curated terms that are frequently related to natural and human-caused disasters (Olteanu et al., 2014). This lexicon will be extended using data mining techniques to extract keywords from manuals used to code political events (Jenkins et al., 2012) and financial crises (Wolfson & Epstein, 2013). Posteriormente, emplearemos el SRL como consulta de búsqueda para extraer el contenido y metadatos de artículos de periódicos de diversas fuentes de noticias utilizando la fuente de datos de LexisNexis.

Step 2. Extraction of Events

The extracted newspaper articles will be subjected to a clustering process using both title and content. Then, with the help of large language models, they will be classified into groups of news items referring to the same event. These clusters, called "candidate events", will be subjected to a validation by experts who will verify that the news articles really belong to the same event. Based on the experts' feedback, the candidate events will be updated to ensure their accuracy and relevance. After validation, the groups will pass to a status called "validated events", which will be stored in a database with the content corresponding to each news item and its associated metadata.

Step 3. Analysis of Indicators

Con los articulos de noticias previamente almacenados en la base de datos y clasificados por eventos, analizaremos indicadores cuantificables que suelen mencionarse en los artículos periodísticos. Por ejemplo, el número de víctimas mortales, el número de refugiados, las pérdidas económicas, entre otros. Estos indicadores se normalizan en relación con sus respectivos valores máximos alcanzables para que sean comparables entre eventos y paises.

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