

IMPACT OF CLIMATE CHANGE ON SENTIMENT IN PORTUGAL

How social media analysis can inform effective policy-making

PI: Prof. Siqi Zheng | Researcher: Jianghao Wang | Graduate Student: Nicolas Guetta Jeanrenaud
Collaborators: Isabel Loureiro (University of Minho, Portugal),
Marco Painho, Miguel de Castro Neto, Pedro Cabral (Universidade Nova de Lisboa)

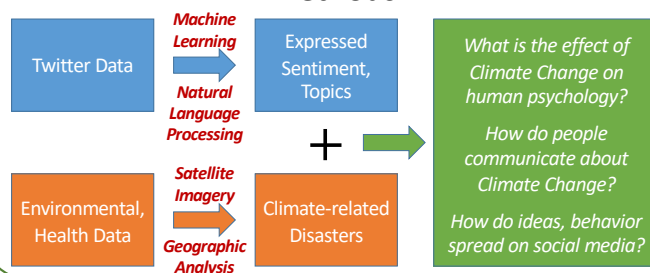


Research Motivation

Climate Change poses **important risks** in Portugal (extreme temperatures, droughts, rising sea levels). Insufficient research focuses on its **perception** and **impact on wellbeing**.

Understanding **human attention** and **subjective evaluation** can be done **at a global level** through **social media analysis**. In conjecture with environmental data, these results can inform policy-makers on the **“emotional toll of climate change”**.

Methods



Main Results:

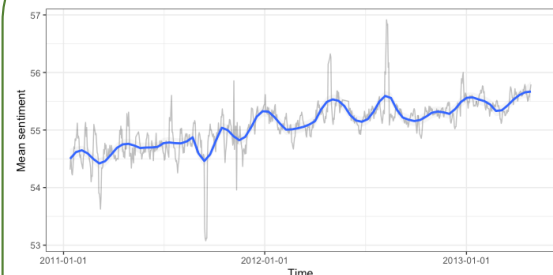


Figure 1: Sentiment in Portugal over time from January 1, 2011, to May 30, 2013, as measured by the Hedonometer imputation method.

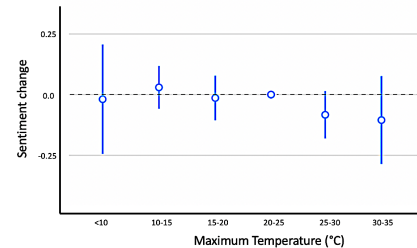


Figure 2: Effect of maximum daily temperature on sentiment in Portugal (only tweets in Portuguese). Regressions control for precipitation, humidity, wind speed, air pollution, and cloud coverage, with city, month, and day-of-week fixed effects.

Sentiment Imputation Methods

| Hedonometer | BERT Embeddings | Emoji |
|--|--|--|
| <ul style="list-style-type: none">Dictionary-basedLanguage-specific | <ul style="list-style-type: none">ML-basedConsistent across languages | <ul style="list-style-type: none">Uses only EmojisConsistent across languages |

Conclusion

Climate change and COVID-19 have had a **significant toll on subjective wellbeing in Portugal**, as measured on social media. These are important additional costs that policy-makers must account for when considering policy options.

Further research can explore:

- Determinants of **geographic heterogeneity** in sentiment, such as cultural, economic, and political systems.
- How **awareness** and **attention** to these events can help **mitigate their effects** on the long run.
- Quantifying the **effectiveness** of individual behavior or policy action on collective psychological wellbeing.

Other Results: Impact of COVID-19

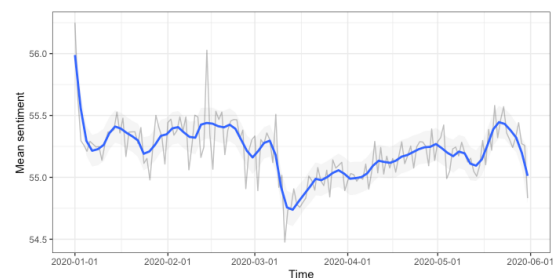


Figure 3: Sentiment in Portugal over time from January 1, 2020, to May 30, 2020, as measured by the BERT imputation method.

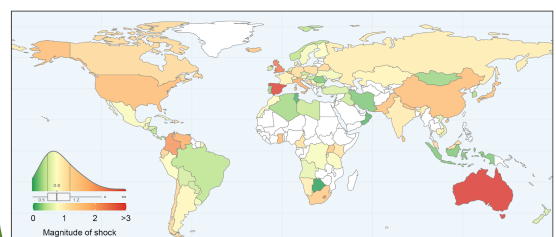


Figure 4: Magnitude of sentiment shock due to COVID-19 worldwide, as measured by the BERT imputation method.