

# IMPACT OF CLIMATE CHANGE ON SENTIMENT IN PORTUGAL



## How social media analysis can inform effective policy-making

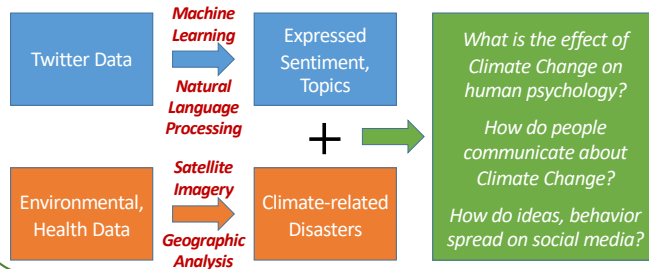
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### Research Motivation

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:

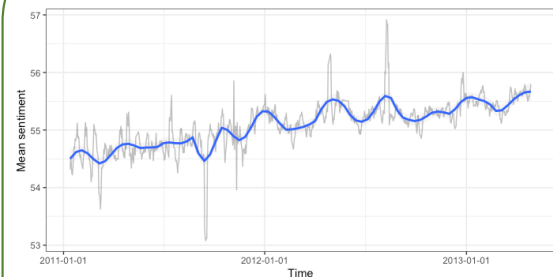


Figure 1: Sentiment in Portugal over time from January 1, 2011, to May 30, 2013, as measured by the Hedonometer imputation method.

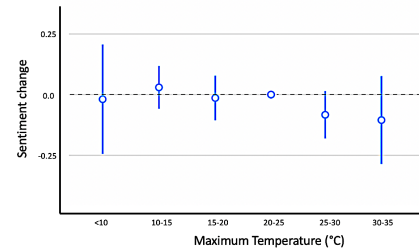


Figure 2: Effect of maximum daily temperature on sentiment in Portugal (only tweets in Portuguese). Regressions control for precipitation, humidity, wind speed, air pollution, and cloud coverage, with city, month, and day-of-week fixed effects.

### Sentiment Imputation Methods

Hedonometer	BERT Embeddings	Emoji
<ul style="list-style-type: none"> <li>Dictionary-based</li> <li>Language-specific</li> </ul>	<ul style="list-style-type: none"> <li>ML-based</li> <li>Consistent across languages</li> </ul>	<ul style="list-style-type: none"> <li>Uses only Emojis</li> <li>Consistent across languages</li> </ul>

### 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

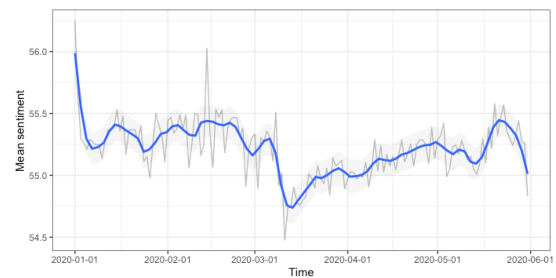


Figure 3: Sentiment in Portugal over time from January 1, 2020, to May 30, 2020, as measured by the BERT imputation method.

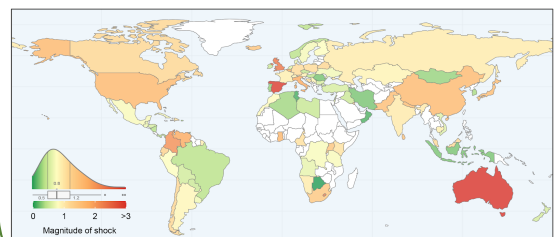


Figure 4: Magnitude of sentiment shock due to COVID-19 worldwide, as measured by the BERT imputation method.