

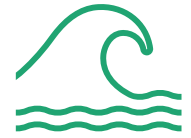
Emojis As Indicators Of Spatial-Temporal-Thematic Developments In Geo-Social Media



Samantha Levi

Technische Universität Dresden

Institut für Kartographie



Emojis As Indicators Of Spatial-Temporal-Thematic Developments In Geo-Social Media



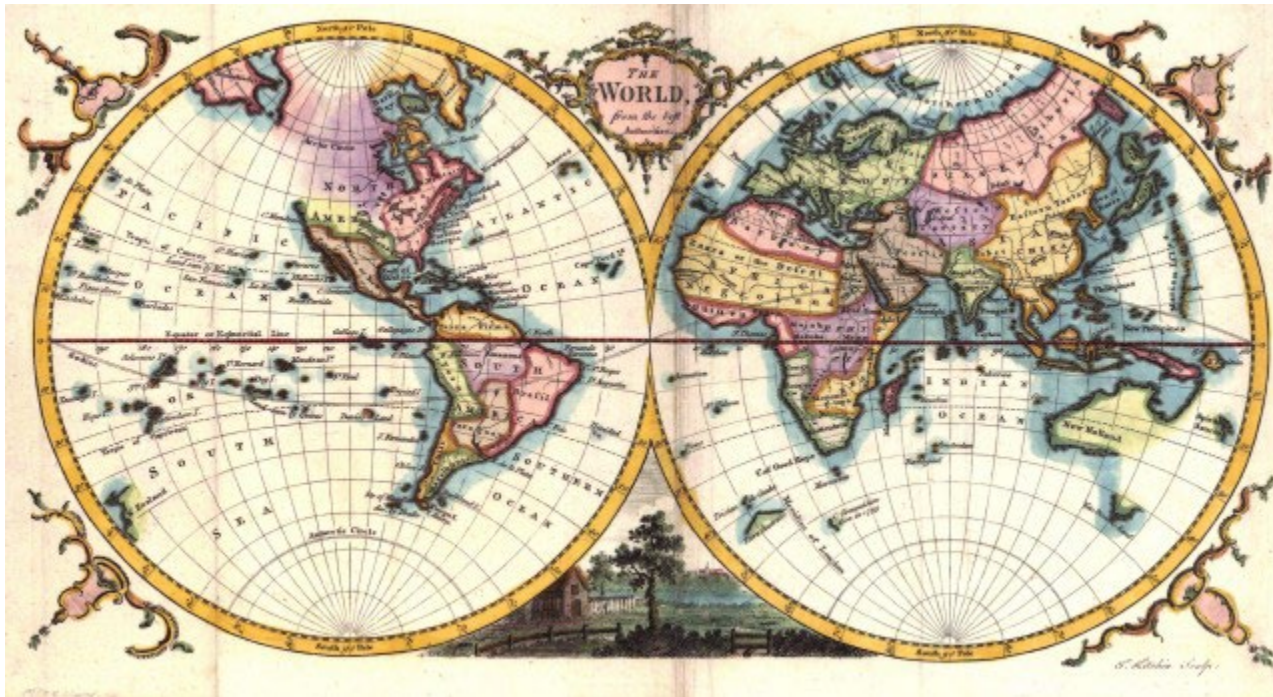
That's a lot of
hyphens.....

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Cartography: What My Parents Think I Study



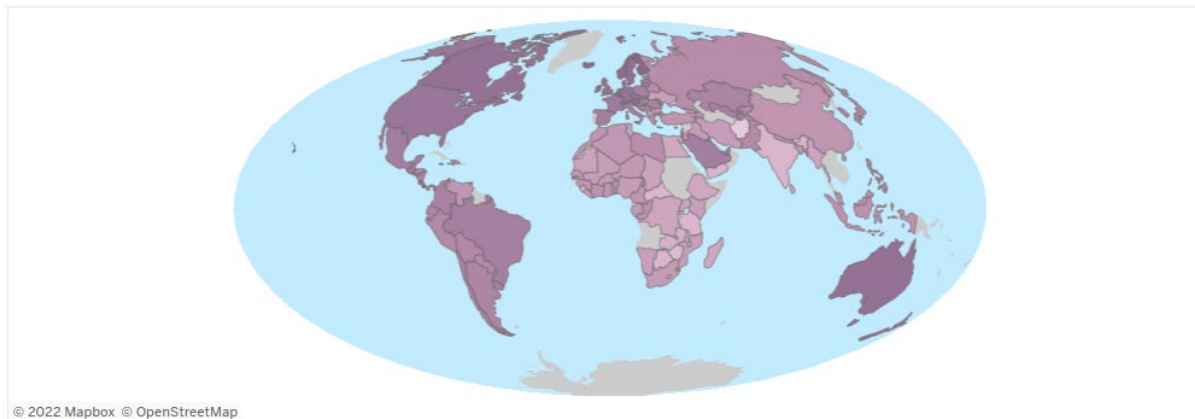
Sources:

<https://pbs.twimg.com/media/ESwqOnRUMAEsSu8.jpg>

<https://media.gettyimages.com/photos/illustration-depicts-flemish-cartographer-gerardus-mercator-with-a-picture-id181962379?s=612x612>

Cartography: What I Actually Study

Influences and Effects of COVID-19 Response



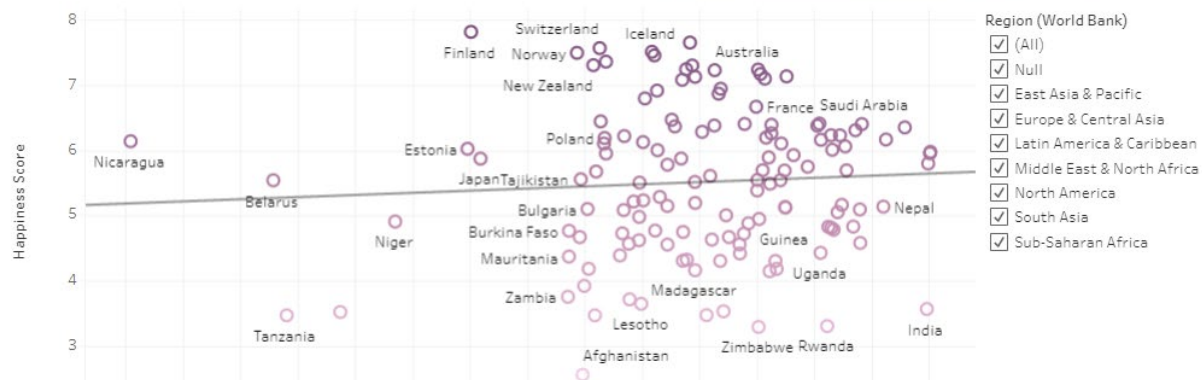
© 2022 Mapbox © OpenStreetMap

Choose View

Happiness Score

2.567

7.809



Emojis As Indicators Of Spatial-Temporal-Thematic Developments In Geo-Social Media



NOT

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Emojis As Indicators Of Spatial-Temporal-Thematic Developments In Geo-Social Media

Dunkel et al. (2019)

SOCIAL (WHO)

Twitter users
Available from raw data



SPATIAL (WHERE)

Geotagged post locations
Available from raw data



TEMPORAL (WHEN)

Time of post
Available from raw data

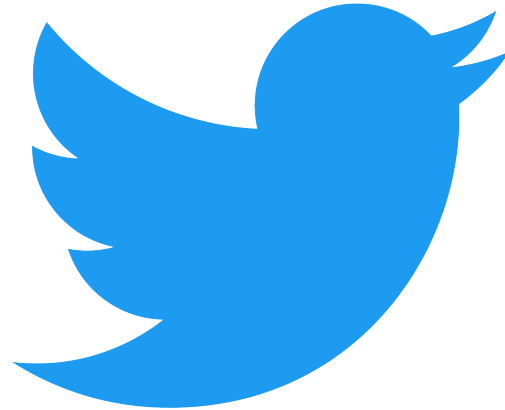


TOPICAL (WHAT)

Content of post
Derived from hashtags



Emojis As Indicators Of Spatial-Temporal-Thematic Developments In **Geo-Social Media**



The Dataset



~4 MILLION POSTS

GEOTAGGED WITHIN EUROPE

DURING 2020*

AT LEAST ONE EMOJI AND ONE
HASHTAG

* No data available for November 2020

Image source:
<https://about.twitter.com/en/who-we-are/brand-toolkit>



Objective

Goal:

Determine whether emojis can be used to identify relevant topics and their spatial-temporal evolution in a non-topic-specific dataset

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Goal:

Determine whether emojis can be used to identify relevant topics and their spatial-temporal evolution in a non-topic-specific dataset

Basically...

Without first filtering the dataset by subject (like most other studies), what can trends in emoji usage tell us about the topics people discuss on Twitter?

Exploratory Analysis

Initial Results

	January	February	March	April	May	June	July	August	September	October	December
0	😂	❤️	😂	😂	❤️	❤️	❤️	❤️	😂	😂	❤️
1	❤️	😂	❤️	❤️	😂	😂	😂	😂	❤️	❤️	🎄
2	😍	😍	😍	😍	😍	😍	😍	😍	🔴	🔴	😂
3	🔴	🔴	🔴	👏	🔴	🔴	🔴	🔴	😍	😍	😍
4	🎉	💙	👏	🎉	💙	💙	💙	💙	💙	💙	🔴
5	💙	🎉	🎉	🎉	🎉	🎉	🔥	🔥	🎉	🎉	🎉
6	🔥	🔥	🎉	💙	😊	😊	🎉	😎	🔥	🔥	💙
7	👍	👍	💙	👍	👍	👍	😎	🎉	👍	👍	🔥
8	😊	😊	👍	😊	🖤	🔥	😊	☀️	😊	😊	🥰
9	😊	🖤	😊	🔴	👏	😎	👍	😊	🥰	💛	🖤

Initial Results

	Germany	Italy	France	Netherlands	Sweden	United Kingdom	Belgium	Ireland
0	❤️	❤️	❤️	🔴	❤️	😂	❤️	😂
1	😂	😂	😂	🚗	😂	❤️	😂	❤️
2	☔	😍	😍	🚚	😍	👍	😍	👏
3	😍	💪	🙌	🚚	💙	👏	😊	😍
4	👍	💙	👍	❤️	👍	😍	🔥	👍
5	🙌	🚫	🔥	😂	🙌	🚫	😎	🚫
6	😊	♥️	😊	👍	😎	💙	👍	♥️
7	😎	🔥	💪	💪	💪	😊	🙌	👏
8	💪	🙌	😭	😊	☀️	🙌	💪	🙌
9	😊	♥️	🚫	😍	😊	👏	♥️	💙

Uh.... Okay?



Typicality

Hauthal et al. (2021)

Purpose

Identify the most characteristic emojis within a **designated subset of a larger dataset**

Other statistical measures, like absolute or relative frequency, only reveal most commonly used characters

Typicality normalizes emoji usage over the dataset, allowing for the calculation of relative differences

Calculation

$$\text{Typicality} = \frac{ns/Ns - nt/Nt}{nt/Nt} = \frac{\text{Rel. freq. within the subset} - \text{rel. freq. within the total dataset}}{\text{rel. freq. within the total dataset}}$$

Interpretation

Positive typicality: an occurrence is typical for the subset compared to the total dataset

Negative typicality: an occurrence is atypical for a subset compared to the total dataset

The greater the absolute value, the more typical or atypical the occurrence

Typicality

Hauthal et al. (2021)

Purpose

Identify the most characteristic emojis within a **designated subset of a larger dataset**

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Typicality

Basically...

ferences

For a given (spatial or temporal) subset of the data,
how 'characteristic' or 'typical' of that subset is a
given emoji?

Typical

dataset

Still confused? Let's take a look:

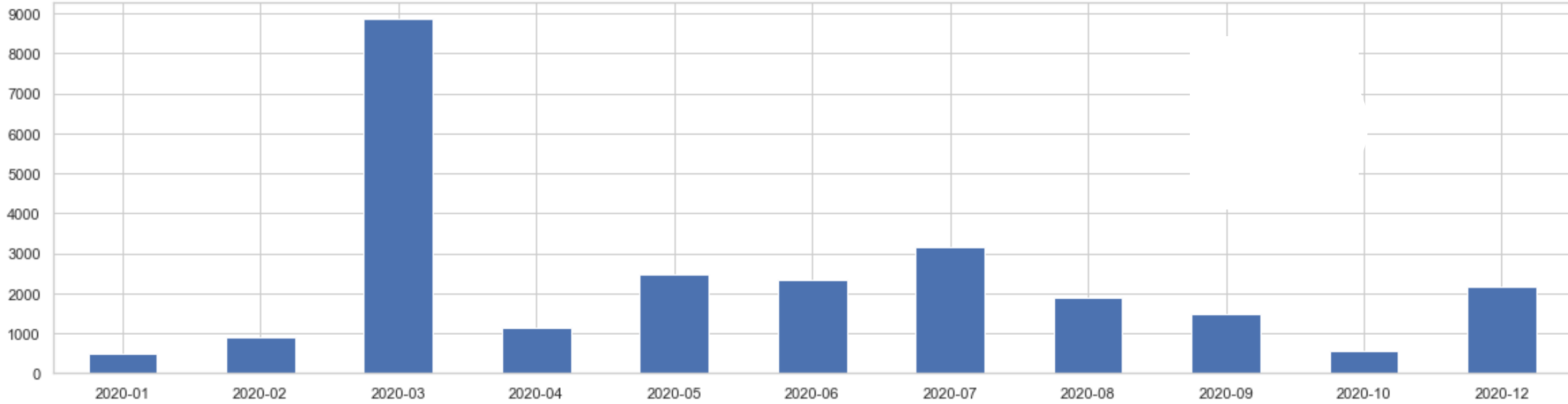
Positive typicality: an occurrence is typical for the subset compared to the total dataset

Negative typicality: an occurrence is atypical for a subset compared to the total dataset

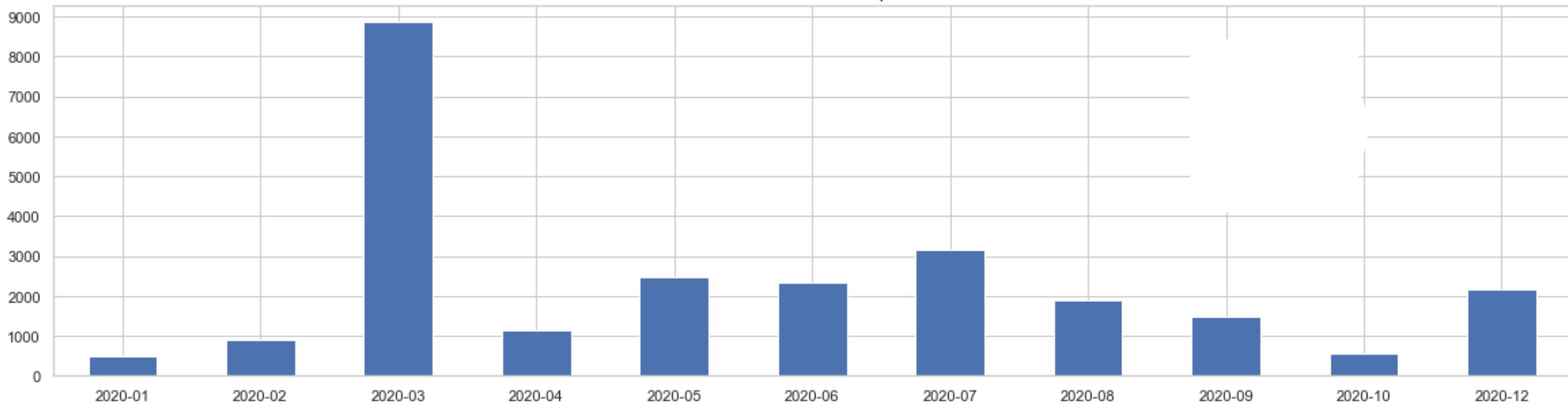
The greater the absolute value, the more typical or atypical the occurrence

Temporal Typicality

Number of Mask Tweets per Month



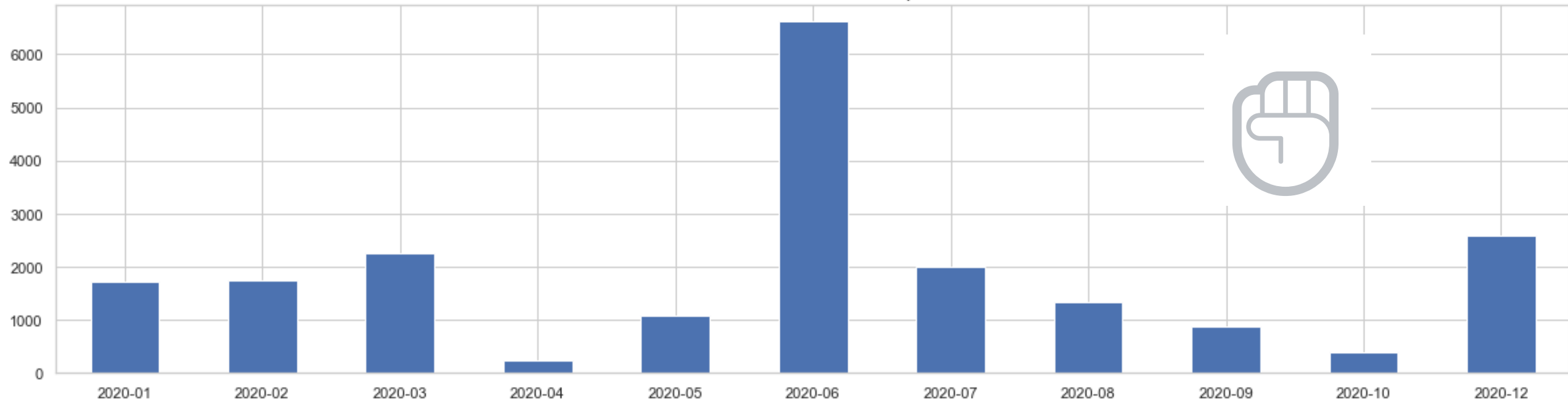
Number of Mask Tweets per Month



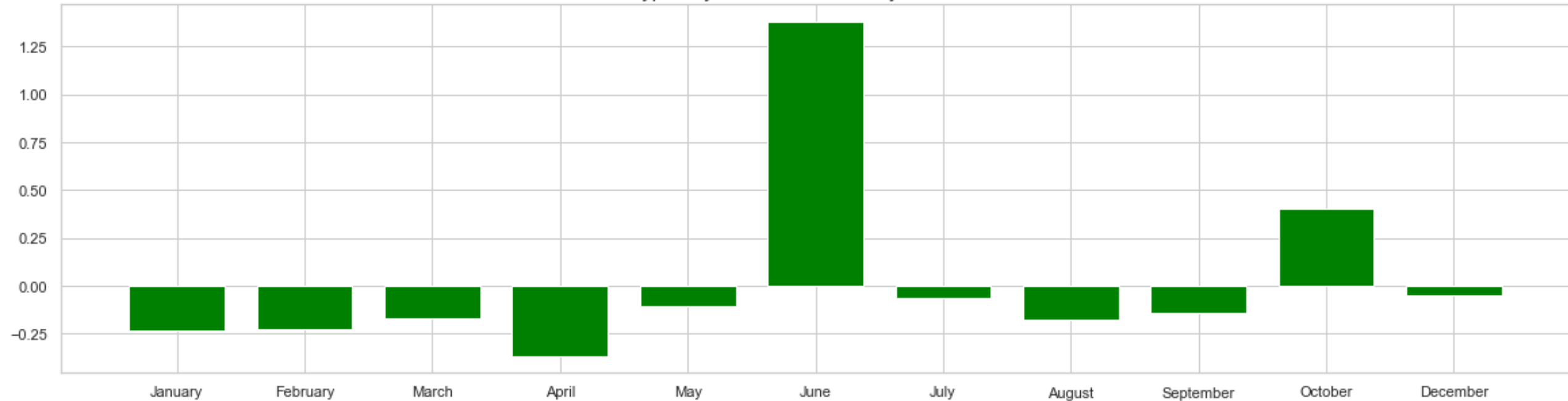
Typicality of Masked Face Emoji Over Time



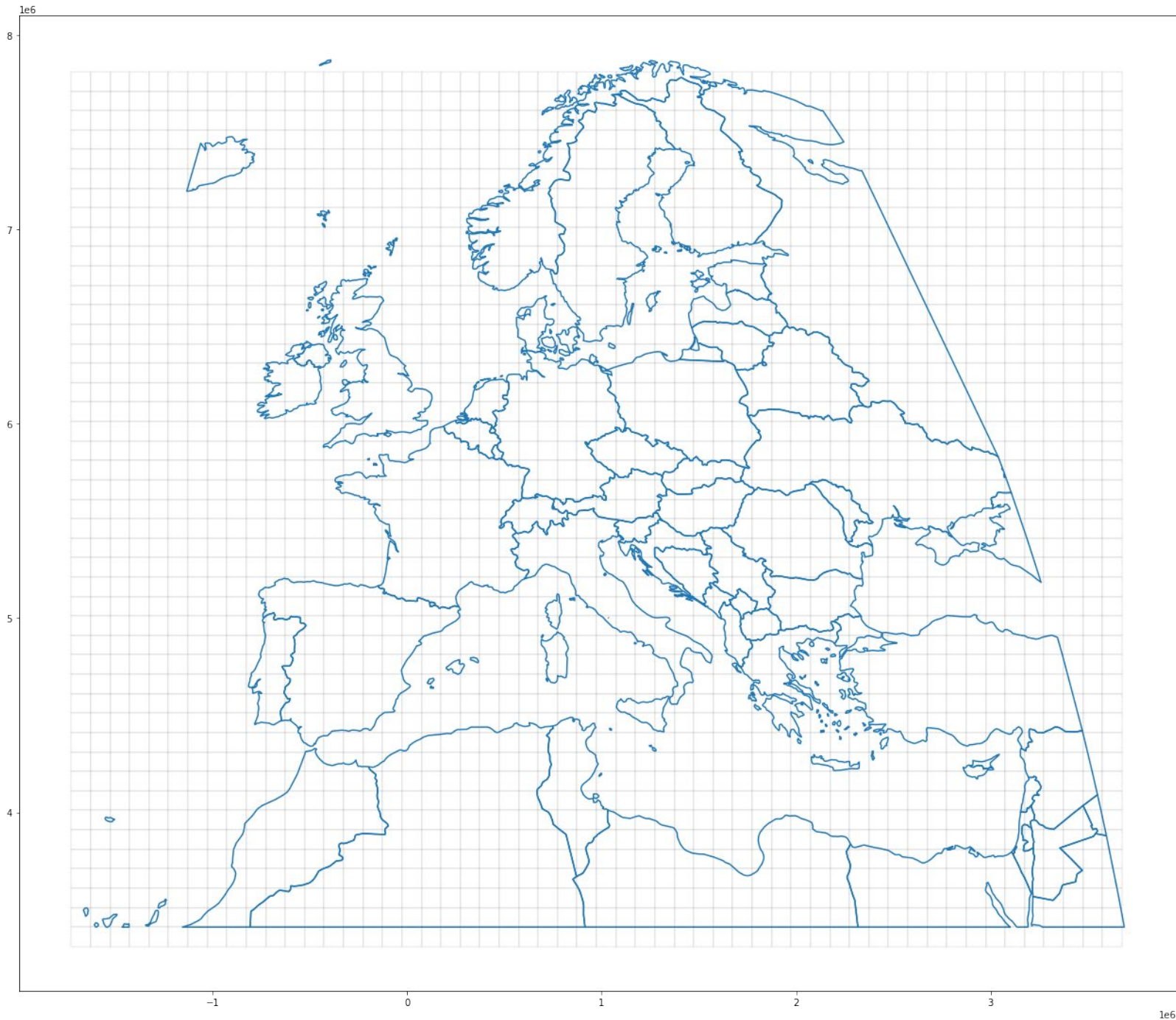
Number of Raised Fist Tweets per Month



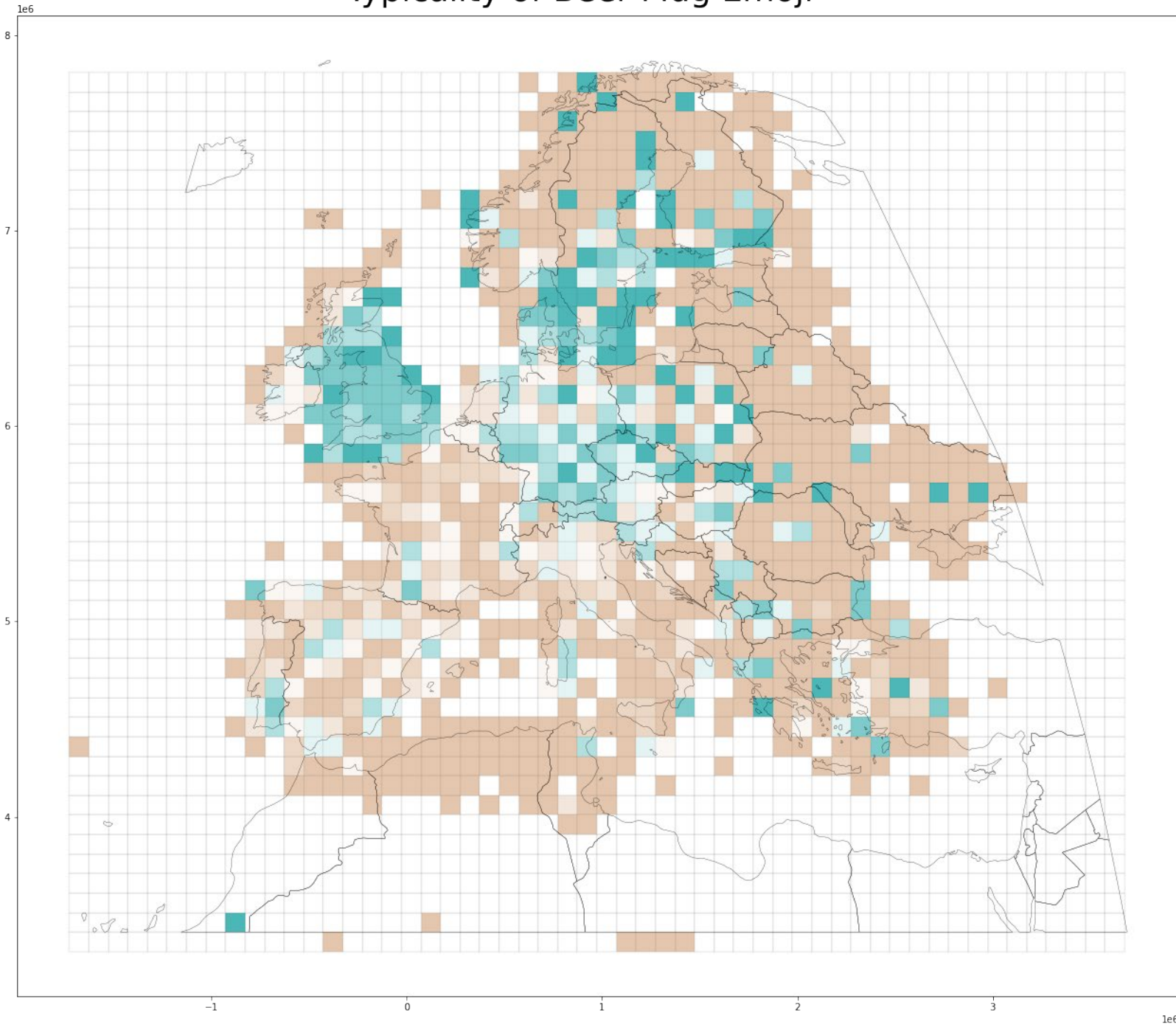
Typicality of Raised Fist Emoji Over Time



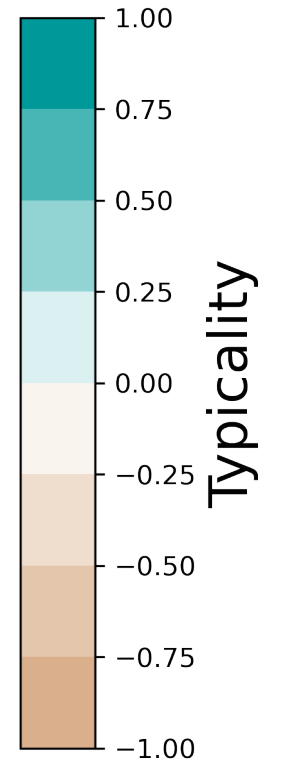
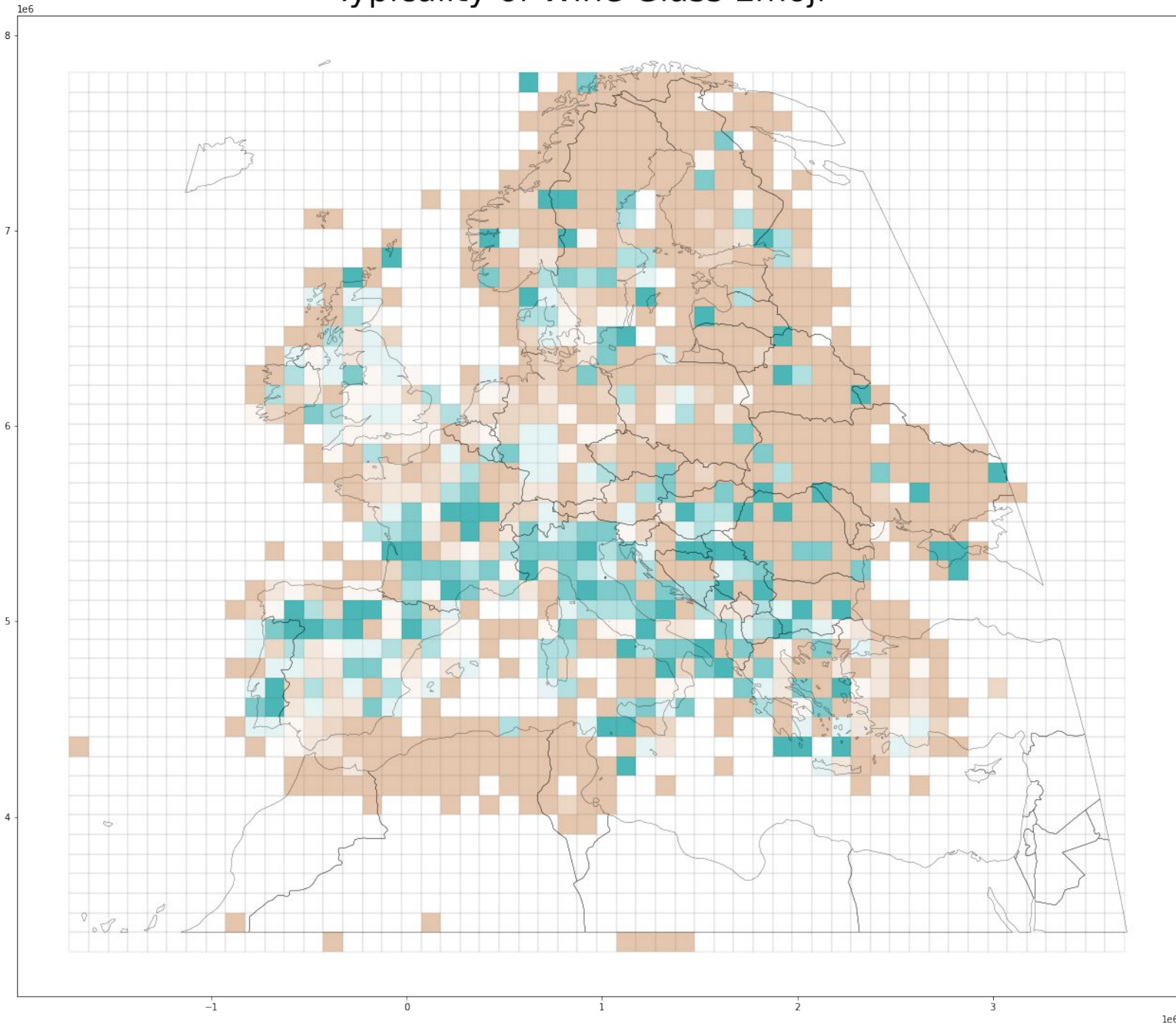
Spatial Typicality



Typicality of Beer Mug Emoji

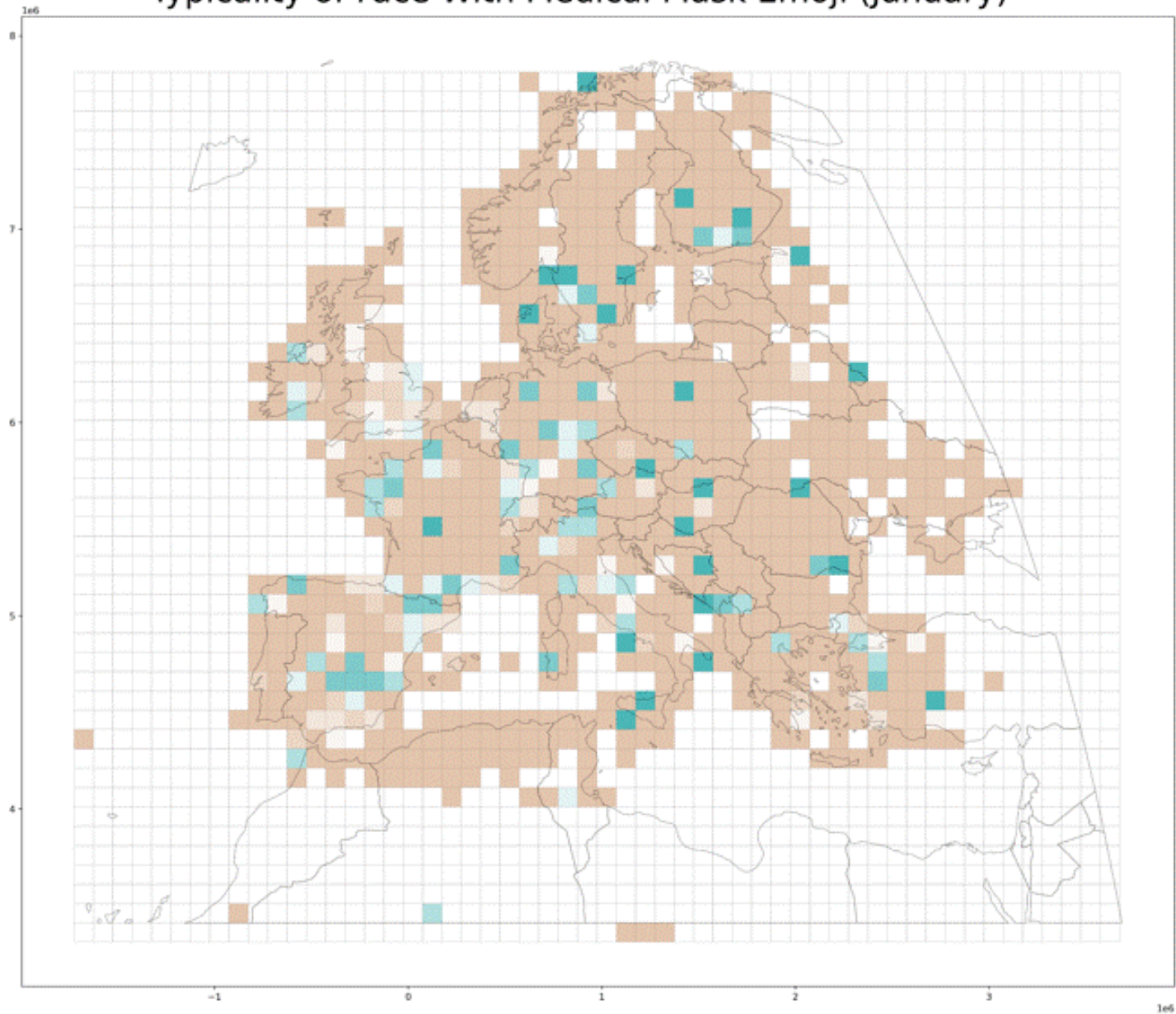


Typicality of Wine Glass Emoji

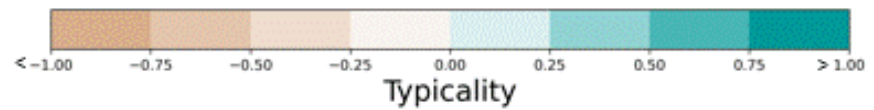


Spatial-Temporal Typicality

Typicality of Face With Medical Mask Emoji (January)



□ = 10,000 square kilometers





WWW.PHDCOMICS.COM

Image source:
<https://phdcomics.com/comics.php?f=1711>

Thank You!

Questions? Comments?