

# EMOTION ANALYSIS OF THE INTERACTION BETWEEN PHARMACEUTICAL COMPANIES AND THE PUBLIC ON SOCIAL MEDIA

S. Gyftopoulos<sup>\*,\*\*,\*</sup>, G. Drosatos<sup>\*,\*\*,\*</sup> and E. Kaldoudi<sup>\*,\*\*,\*</sup>

\* European Alliance for Medical and Biological Engineering and Science, Brussels, Belgium

\*\* Institute for Language and Speech Processing, Athena Research Center, Xanthi 67100, Greece

\*\*\*School of Medicine, Democritus University of Thrace, Alexandroupoli 68100, Greece

sotiris.gyftopoulos@athenarc.gr, gdrosato@athenarc.gr, kaldoudi@med.duth.gr

## Instruction

During the COVID-19 pandemic, people on social media were bombarded with information creating, thus, a communicational chaos where the distinction between fake and truthful news is challenging [1]. In our research, we focus on the communication between the pharmaceutical companies and the public on a social network with a prominent role. We collected and analyzed the exchanged messages between the companies and the public, evaluated the emotional profile of the posts, and examined the public's response.

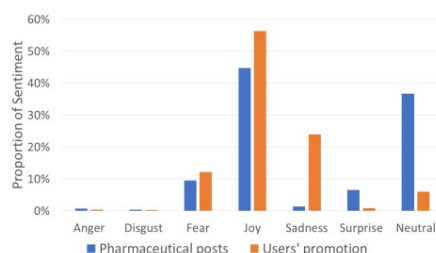


Figure 1. Average emotions of users' reaction to pharmaceutical companies' posts

## Material and Methods

We utilized a list of pharmaceuticals with worldwide activity [2] to retrieve their accounts on Twitter, their COVID-19 related posts on the social network and the users' reactions (i.e., quotes and replies). The assembled corpus contained 65,136 tweets of the companies and 377,003 reactions by the users posted during the period from March 2020 to September 2022. The English posts of the dataset were provided as input to a state-of-the-art deep learning model for emotion analysis [3].

## Results

Figure 1 provides evidence that the users enhanced through their retweet activity the emotions of fear, joy and sadness that were circulated by the companies posts, while Figure 2 indicates a similar response by the users only for joy in other users' posts. However, the average value of joy in the users' posts is lower than the corresponding value in the pharmaceuticals' posts.

## Discussion

The findings of our analysis reveal the complex emotional landscape in the communication channel

between pharmaceutical companies and the public. Further analysis can reveal in finer detail the behavior of the users towards high esteem accounts that convey important information, especially in times of pandemic.

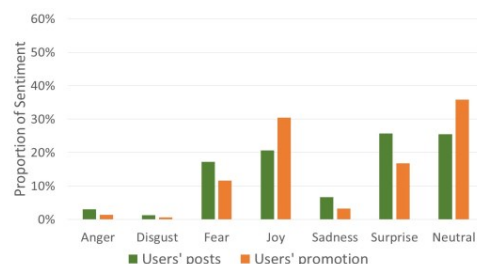


Figure 2. Average emotions of users' reaction to other users' posts (quotes and replies)

## References

1. M. Jamison, D. Broniatowski, M. Dredze, A. Sangraula, M. C. Smith and S. C. Quinn (2020) Not just conspiracy theories: Vaccine opponents and proponents add to the COVID-19 'infodemic' on Twitter. Harvard Kennedy School (HKS) Misinformation Review, 1(3)
2. List of pharmaceutical companies at en.wikipedia.org/w/index.php?title=List\_of\_pharmaceutical\_companies&oldid=1102115827
3. N. Colnerič and J. Demšar (2020) Emotion Recognition on Twitter: Comparative Study and Training a Unison Model, IEEE Transaction on Affective Computing, 11:433-446

## Keywords:

Social network, pharmaceutical companies, COVID-19, emotion analysis

## Acknowledgement

This paper is based on research that is executed within the scope of the project "PandeVITA – Pandemic Virus Trace Application for the Effective Knowledge Transfer Between Science and Society Inside the Quadruple Helix Collaboration". The project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 101006316.