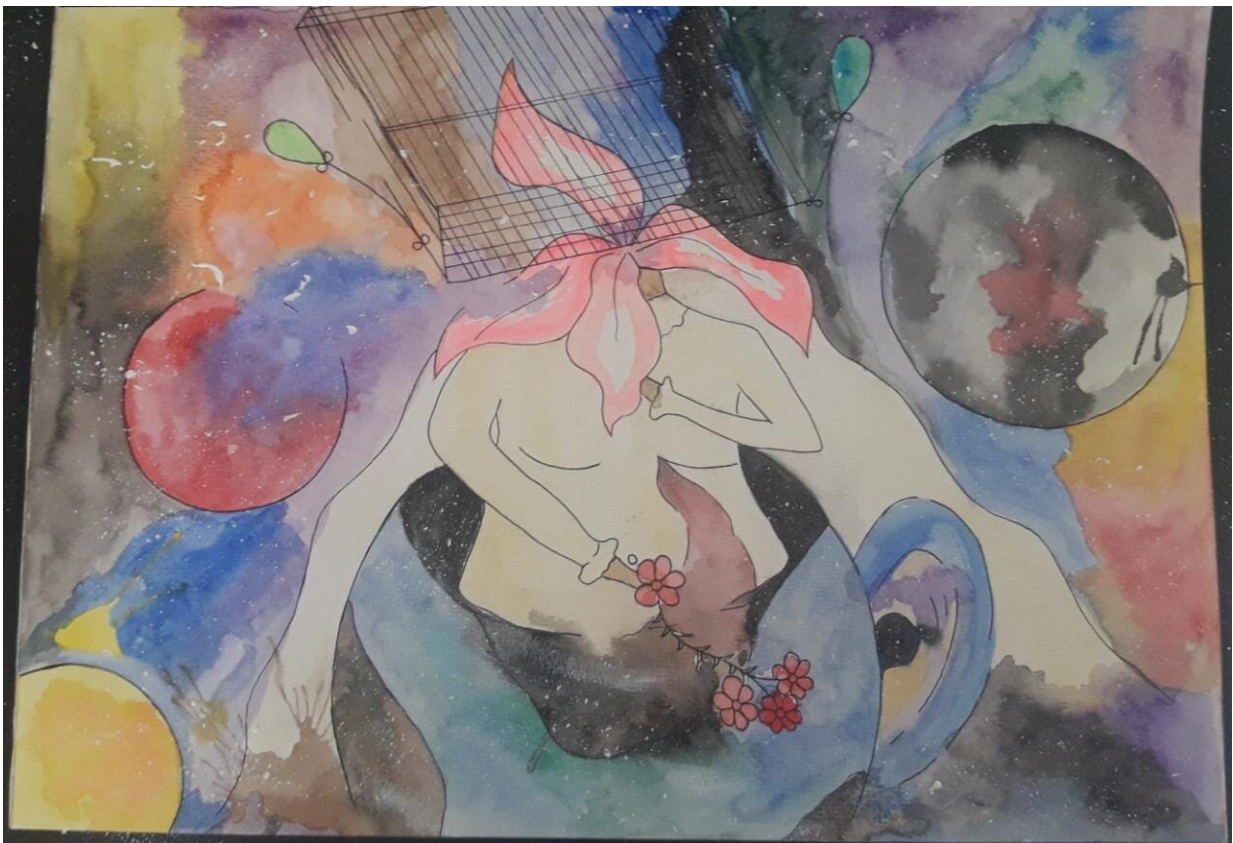


Studies use mathematics to analyze the semantics of dream reports during the pandemic

February 4 2021, by Luciana Constantino |



Researchers at a center for neuromathematics say dreams reflect the fear and anxiety fueled by the disease. Credit: Weid de souza

The COVID-19 pandemic has affected people's behavior everywhere. Fear, apprehensiveness, sadness, anxiety, and other troublesome feelings have become part of the daily lives of many families since the first cases of the disease were officially recorded early last year.

These turbulent feelings are often expressed in dreams reflecting a heavier burden of mental suffering, fear of contamination, stress caused by social distancing, and lack of physical contact with others. In addition, dream narratives in the period include a larger proportion of terms relating to cleanliness and contamination, as well as anger and sadness.

All this is reported in a study published in *PLOS ONE*. The principal investigator was Natália Bezerra Mota, a neuroscientist and postdoctoral fellow at the Brain Institute of the Federal University of Rio Grande do Norte (UFRN), in Brazil.

The study was part of Mota's postdoctoral research and was supervised by Sidarta Ribeiro at UFRN and Mauro Copelli at the Federal University of Pernambuco (UFPE), both of whom are affiliated with the Neuromathematics Research, Innovation and Dissemination Center (NeuroMat).

Neuromat is hosted by the University of São Paulo (USP) and is one of many Research, Innovation and Dissemination Centers (RIDCs) supported by São Paulo Research Foundation—FAPESP.

The results are consistent with the hypothesis that dreams reflect the challenges of waking-life experience during the pandemic, and that the prevalence of negative emotions such as anger and sadness during the period reflects a higher emotional load to be processed, the authors write.

According to Mota, the findings are corroborated by those of other studies published later by researchers in the United States, Germany, and Finland.

The Brazilian study was initially reported in May in a preprint posted to medRxiv, and not yet peer-reviewed at that time. "It's the first study on the subject to look empirically at these signs of mental suffering and their association with the peculiarities of dreams during the pandemic," Mota told.

For Ribeiro, the authors of the study managed to document the continuity between what happens in the dream world and people's mental lives, especially psychological distress. "This is interesting from the standpoint of dream theory," he said. "Another point worth highlighting is that they did so quantitatively, using mathematics to extract semantics."

The group deployed natural language processing tools to analyze 239 dream reports by 67 subjects produced in March and April 2020, shortly after the World Health Organization (WHO) declared a pandemic.

According to Mota, researchers at USP, UFRN, and the Federal Universities of Minas Gerais (UFMG), Rio Grande do Sul (UFRGS) and Rio de Janeiro (UFRJ) are conducting a multicentric study involving the analysis of data collected during a longer period (from the start of the pandemic through July) to see how dreams are affected by the deaths of family members, loved ones, friends and co-workers. "The plan is to publish the findings as soon as they're ready so that mental health strategies can be based on this knowledge," she said.

For some time the researchers have been developing and using computer software that analyzes language to diagnose mental illnesses, such as schizophrenia, and adapting similar tools to perform cognitive

assessments.

Dream accounts recorded by the volunteers using a smartphone app were transcribed and analyzed using three software tools. The first focused on discourse structure, word count, and connectedness.

The other two focused on content. One ranged words in certain emotional categories against a list associated with positive and negative emotions. The other used a neural network to detect semantic similarity to specified keywords, such as contamination, cleanliness, sickness, health, death and life.

In their *PLOS ONE* publication, the researchers say "the significant similarity to 'cleanness' in dream reports points towards new social strategies (e.g. use of masks, avoidance of physical contact) and new hygiene practices (e.g. use of hand sanitizer and other cleaning products) that have become central to new social rules and behavior. Taken together, these findings seem to show that dream contents reflect the different sources of fear and frustration arising out of the current scenario."

Mota noted that more suffering was expressed in the [dream](#) reports submitted by female volunteers, although this was detected indirectly. "There are studies on gender difference in the literature. Women report more negative dreams and nightmares. I think this has to do with women's history and daily lives, with working a double or triple shift, and the heavier mental burden entailed by concerning themselves with a job plus the home and children. The pandemic has made this worse," she said.

More information: Natália Bezerra Mota et al, Dreaming during the Covid-19 pandemic: Computational assessment of dream reports reveals mental suffering related to fear of contagion, *PLOS ONE* (2020). [DOI:](#)

[10.1371/journal.pone.0242903](https://doi.org/10.1371/journal.pone.0242903)

Provided by FAPESP

Citation: Studies use mathematics to analyze the semantics of dream reports during the pandemic (2021, February 4) retrieved 9 May 2024 from

<https://medicalxpress.com/news/2021-02-mathematics-semantics-pandemic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.