Understanding the magic of movie watching in the brain

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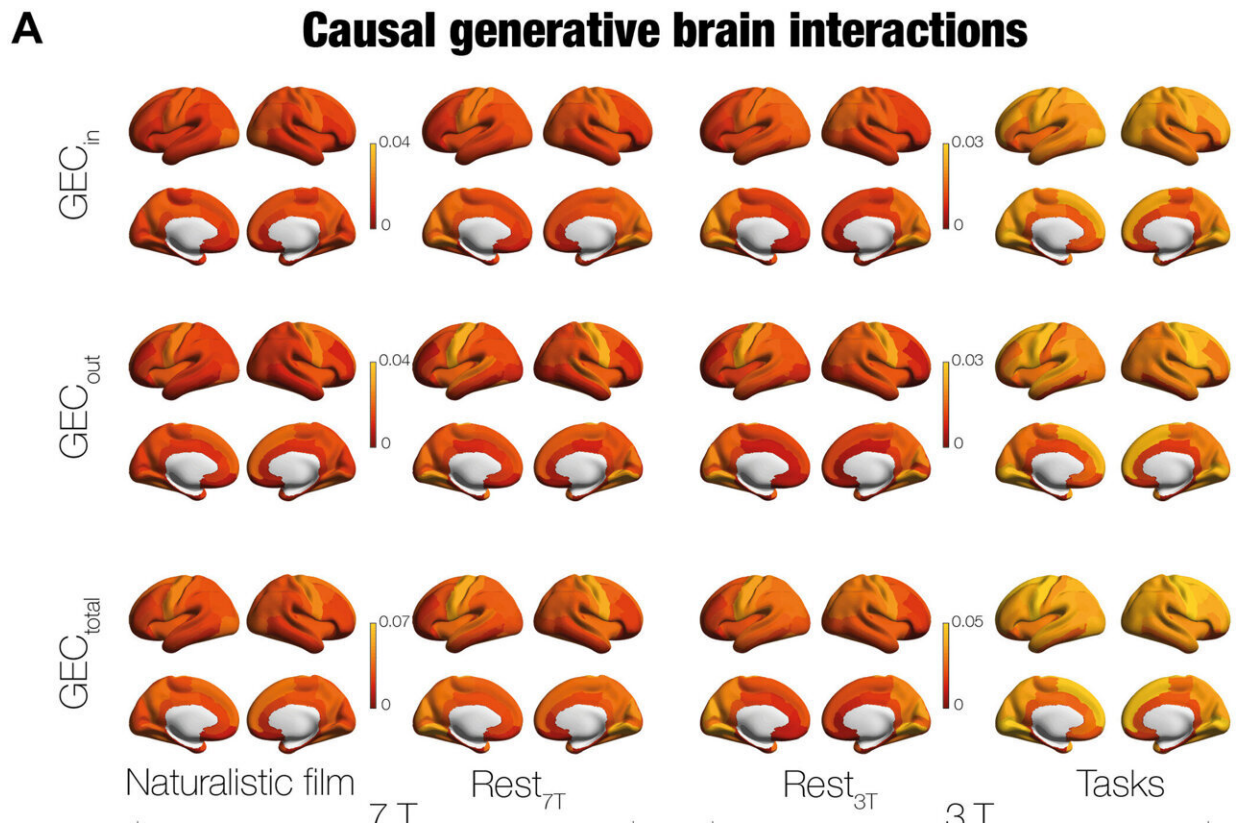

Identifying the underlying causal drivers of hierarchy changes in movies, rest and tasks. Credit: *Science Advances* (2023). DOI: 10.1126/sciadv.ade6049

In a new article, published in *Science Advances*, researchers from Universities of Oxford (UK), Aarhus (Denmark), Buenos Aires

(Argentina) and UPF have shown how watching movies, a favorite pastime for billions of people, makes us feel and think in often transformative ways compared to our everyday experiences.

In a technical tour-de-force, the authors used high resolution large-scale neuroimaging data from 176 people watching movies clips from films including Inception, The Social Network, Ocean's Eleven, Home Alone, Erin Brockovich and The Empire Strikes Back to directly investigate the hierarchical reorganization of the brain when watching movies.

The research suggests that less computation is needed when watching movies.

Building whole-brain models of the brain activity elicited by movie watching as well as from that elicited in the same people resting or performing tasks allowed the authors to show that the brain hierarchy is flatter when watching movies compared to both rest and tasks. This suggests that less computation is needed when watching movies. Paradoxically, the brain is therefore less driven by internal dynamics in movie watching than when performing tasks or when resting.

This shows that while watching movies, we are momentarily free from the stressful experience of working and having to solve problems. Instead, the brain is allowed to just absorb the narrative, leading to engagement of the necessary brain circuitry responsible for the highly motivating and soothing pleasure of movies.

Professor Gustavo Deco, senior author of the article, says, "The study provides novel, important insights into the causal mechanisms underlying complex changes in brain hierarchy. Using more naturalistic stimuli such as movies provide a fast and convenient way to measure important changes in the anatomical connectivity found in, for example, neuropsychiatric disorders, and can lead to new insights in vulnerable

populations including children."

Lead author of the article, Professor Morten L. Kringelbach, adds, "This study provides intriguing new evidence for how movies can change the whole-brain hierarchical organization needed for orchestrating brain computation. The brain abstracts coherent narratives from still images and sound, which sets us free to transcend the rat race of survival, if even for the briefest moment. The study shows the truth of words of the late great French director Jean-Luc Godard: 'Cinema is the most beautiful fraud in the world'."

More information: Morten L. Kringelbach et al, Toward naturalistic neuroscience: Mechanisms underlying the flattening of brain hierarchy in movie-watching compared to rest and task, *Science Advances* (2023). DOI: 10.1126/sciadv.ade6049

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