

## PRESS RELEASE

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### How the human brain builds our sense of time

**From hitting a tennis ball at 200 km/h to waiting for a delayed train, our lives are shaped by time. A new study from SISSA explains how our brain constructs the perception of time.**



Trieste, 2 April 2026

How does Jannik Sinner manage to hit the ball at exactly the right moment, with remarkable precision? And how do we, in everyday life, perceive the duration of events around us? The answer lies in how the brain constructs the perception of time, as shown by research published in PLOS Biology by Valeria Centanino, Gianfranco Fortunato, and Domenica Bueti.

Starting from what we see—such as an approaching ball—temporal information is processed by the brain through progressively more complex stages: from the occipital visual cortex, to parietal and premotor areas, and finally to frontal regions.

Using high-field functional magnetic resonance imaging (fMRI) and measuring time perception in healthy volunteers, the researchers shed light on what happens in the brain when we estimate the duration of a visual stimulus.

“Our results show that time perception is not a unitary process, but the outcome of multiple processing stages distributed across the cerebral cortex,” the authors explain. “Each stage contributes differently, from encoding physical duration to constructing the subjective experience of time.”

In an initial stage, occipital visual areas encode duration through gradual (monotonic) neural responses: the longer the stimulus, the stronger the neural response. This information is then transformed in parietal and premotor regions into selective (unimodal) representations, where distinct neural populations respond preferentially to specific durations, enabling the “readout” of time. Finally, higher-order regions—including the frontal cortex and anterior insula—are involved in the subjective categorization of duration, shaping how time is perceived.

The PLOS Biology study goes beyond identifying where time is processed in the brain, proposing instead a mechanistic model of how temporal information is processed.

This new framework not only advances our understanding of time perception but also opens new avenues for investigating how the brain constructs subjective time—and why this experience can sometimes be distorted.

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#### USEFUL LINKS

[The original paper](#)

#### IMAGE

Credits: [Unsplash](#)

#### SISSA

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