

# Research finds relaxing words heard during sleep can slow the heart down

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Center of Research Cyclotron at the University of Liège reveals that the sleeping body also reacts to the external world during sleep, explaining how some information from the sensory environment can affect sleep

quality.

Researchers at ULiège have collaborated with the University of Fribourg in Switzerland to investigate whether the body is truly disconnected from the external world during sleep. To do so, they focused on how the heartbeat changes when we hear different words during sleep. They found that relaxing words slowed down cardiac activity as a reflection of deeper sleep and in comparison to neutral words that did not have such a slowing effect.

This discovery is [presented](#) in *Journal of Sleep Research* and sheds new light on brain-heart interactions during sleep.

Matthieu Koroma (Fund for Scientific Research—FNRS postdoctoral researcher), Christina Schmidt, and Athena Demertzi (both Fund for Scientific Research—FNRS Research Associate) from the GIGA Cyclotron Research Center at ULiège teamed up with colleagues from the University of Fribourg on a previous study analyzing brain data (electroencephalogram) showing that relaxing words increased deep sleep duration and [sleep quality](#), showing that we can positively influence sleep using meaningful words.

The authors hypothesized that the brain also remains able to interpret sensory information in a way that makes our body more relaxed after hearing relaxing words during sleep. In this new study, the authors had the opportunity to analyze cardiac activity (electrocardiogram) to test this hypothesis and found that the heart slows down its activity only after the presentation of relaxing, but not control words.

Markers of both cardiac and [brain activity](#) were then compared to disentangle how much they contributed to the modulation of sleep by auditory information. Cardiac activity has been indeed proposed to contribute to the way we perceive the world directly, but such evidence

has so far been obtained in wakefulness.

With these results, the ULiège researchers showed that it was also true in sleep, offering a new perspective on the essential role of bodily reactions beyond brain data for our understanding of sleep.

"Most of sleep research focuses on the brain and rarely investigates bodily activity," says Dr. Schmidt.

"We nevertheless hypothesize that the brain and the body are connected even when we cannot fully communicate, including sleep. Both brain and body information need then to be taken into account for a full understanding of how we think and react to our environment," explains Dr. Demertzi.

"We shared our methodology freely following the principles of open science, hoping that the tools that helped to make this discovery will inspire other researchers to study the role played by the heart in other sleep functions," Dr. Koroma advocates.

This work offers a more comprehensive approach to the modulation of sleep functions by [sensory information](#). By looking into the cardiac responses to sounds, we may, for example, study in the future the role of the body in the way sounds influence the emotional processing of memories during sleep.

**More information:** Matthieu Koroma et al, Probing the embodiment of sleep functions: Insights from cardiac responses to word-induced relaxation during sleep, *Journal of Sleep Research* (2024). [DOI: 10.1111/jsr.14160](#)

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