

# Scientists determine that 'human thoughts are material'

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The eye tracking experiment. Credit: ©Tomsk State University

Researchers of Tomsk State University and New Bulgarian University claim that human thoughts are able to materialize an object. They've published results of their experiments in the article "Remember down, look down, read up: Does a word modulate eye trajectory away from remembered location?" in the journal *Cognitive Processing*. The authors are researchers from NBU Armina Janyan and Ivan Vankov, and TSU researchers Oksana Tsaregorodtseva and Alex Miklashevsky.

How does language influence the perception of space and particularly the essential dimensions "up-down" and "left-right?" Scientists based their research on the idea of so-called mental stimulation in order to show that human thought is material.

"We wanted to check whether the meaning of words can influence the [mental simulation](#)—that is, the 'play' of the situation in the head, which helps to predict the possible scenario of a situation, to understand and to feel it better. In our experiment

we asked participants to remember the location of the point in which we wrote the words 'up' or 'down,'" said Tsaregorodtseva. "The results indicate that reading the words activates [the representation of] space which is denoted by these [words](#), even if at that moment the person is focused on another process—for example, memorizing location points. The word is able to enhance the sense of reality of the object in space, despite the fact that there are no objects."

Recent data show us that mental simulation is not much different from reality in terms of its perception by the brain. For the brain, the real situation and the simulation are one event.

Experiments conducted by scientists in Europe suggest that the mere attempt to remember the spatial position of a point on the screen can affect the trajectory of our glance. For example, if one memorizes the position of the point in the upper left corner of the screen, and then he is asked to look up on a blank screen, the trajectory of the glance focuses on the opposite side of the point.

This effect is explained by the mental simulation: while the person holds the position of the point in his working memory, it is so active that it forces a person to "go around" this obstacle as if something were there. Words, though inherently intangible, trigger the feeling of a real object in space.

Scientists note that the study is at an early stage, but they speculate on the application of their results in neuropsychology, for example, to help people with impaired spatial perception.

**More information:** Armina Janyan et al. Remember down, look down, read up: Does a word modulate eye trajectory away from remembered location?, *Cognitive Processing* (2015). DOI: [10.1007/s10339-015-0718-5](https://doi.org/10.1007/s10339-015-0718-5)

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