Language shapes how the brain perceives time

May 2 2017

Credit: Lancaster University

Language has such a powerful effect, it can influence the way in which we experience time, according to a new study.

Professor Panos Athanasopoulos, a linguist from Lancaster University and Professor Emanuel Bylund, a linguist from Stellenbosch University and Stockholm University, have discovered that people who speak two languages fluently think about time differently depending on the language context in which they are estimating the duration of events.

The finding, reported in the '*Journal of Experimental Psychology: General*', published by the American Psychological Association, reports

the first evidence of cognitive flexibility in people who speak two languages.

Bilinguals go back and forth between their languages rapidly and, often, unconsciously—a phenomenon called code-switching.

But different languages also embody different worldviews, different ways of organizing the world around us. And time is a case in point. For example, Swedish and English speakers prefer to mark the duration of events by referring to physical distances, e.g. a short break, a long wedding, etc. The passage of time is perceived as distance travelled.

But Greek and Spanish speakers tend to mark time by referring to physical quantities, e.g. a small break, a big wedding. The passage of time is perceived as growing volume.

The study found that bilinguals seemed to flexibly utilize both ways of marking duration, depending on the language context. This alters how they experience the passage of time.

In the study, Professor Bylund and Professor Athanasopoulos asked Spanish-Swedish bilinguals to estimate how much time had passed while watching either a line growing across a screen or a container being filled.

At the same time, participants were prompted with either the word 'duración' (the Spanish word for duration) or 'tid' (the Swedish word for duration).

The results were clear-cut.

When watching containers filling up and prompted by the Spanish prompt word, bilinguals based their time estimates of how full the containers were, perceiving time as volume. They were unaffected by

the lines growing on screens.

Conversely, when given the Swedish prompt word, bilinguals suddenly switched their behaviour, with their time estimates becoming influenced by the distance the lines had travelled, but not by how much the containers had filled.

"By learning a new language, you suddenly become attuned to perceptual dimensions that you weren't aware of before," says Professor Athanasopoulos. "The fact that bilinguals go between these different ways of estimating time effortlessly and unconsciously fits in with a growing body of evidence demonstrating the ease with which language can creep into our most basic senses, including our emotions, our visual perception, and now it turns out, our sense of time.

"But it also shows that bilinguals are more flexible thinkers, and there is evidence to suggest that mentally going back and forth between different languages on a daily basis confers advantages on the ability to learn and multi-task, and even long term benefits for mental well-being."

More information: Supplemental Material for The Whorfian Time Warp: Representing Duration Through the Language Hourglass, *Journal of Experimental Psychology: General* (2017). DOI: 10.1037/xge0000314.supp

Provided by Lancaster University