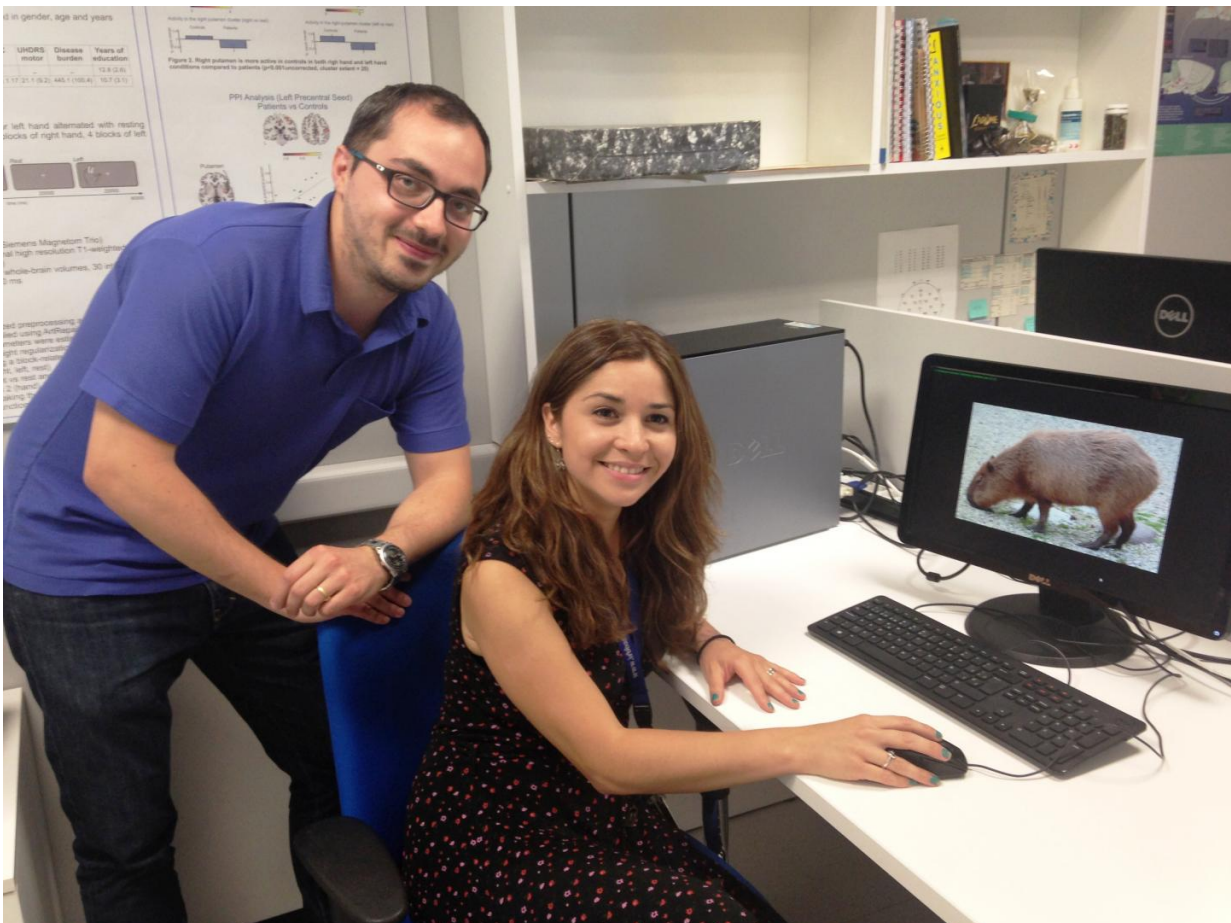


Emotionally positive situations boost memory for similar future events

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Researchers Javier Oyarzún and Pau Packard. Credit: IDIBELL

Rewarding learning today can improve learning tomorrow; this is one of

the conclusions reached by researchers from the Cognition and Brain Plasticity research group of the Institute of Biomedical Research of Bellvitge (IDIBELL) and the University of Barcelona (UB) in their last work on the impact of emotions on the way we remember things. The study, published in the *Neurobiology of Learning and Memory* journal, demonstrates for the first time in humans that the effects of the association of positive emotions in the process of acquisition and consolidation of memories extend selectively and prospectively over time.

Our brain, quoting Javiera Oyarzún, first author of the study, "works as a sorting machine. Every time we expose ourselves to a stimulus, our brain sorts it out in a category, such as people, animals, objects, etc. This way, whenever we receive new information we can integrate it with similar available information thanks to our ability to generalize, and then anticipate our responses to similar stimuli that may occur in the future."

"When storing these stimuli, it is known that emotionally charged events are remembered better than neutral events. For example, we usually do not remember the details surrounding our usual way back home, but if during that time we receive a phone call with good news, or we witness a car accident, we will remember those details with much more precision."

On this basis, the researchers wanted to go further and find out whether a positive experience could also influence the way we remember subsequent events that are similar but do not present this emotional component. In order to do so, Oyarzun explains, "we designed a study with volunteers who were shown a series of images corresponding to two categories (objects and animals), but were only rewarded by one of these categories. For example, every time an image of an animal appeared, the participant received a [financial reward](#), ie, this stimulus was associated with an emotionally positive action".

As expected, participants remembered those images associated with a reward better. In a second session, however, they were shown new images of animals and objects, but knowing that this time there would be no reward. "What we saw is that participants not only remembered "rewarding" images better, but also those of the same semantic category despite knowing that they were not associated with any reward," the researcher explains.

One of the most significant aspects of the published work is that the effects of emotionally positive stimuli on [memory storage](#) are not observed until after 24 hours, ie, it is necessary that the participant sleeps. It is known that during sleep the process of memory consolidation, in which new memories are stabilized based on the integration of new and old information, is maximized; it seems, therefore, that the prospective memory enhancing effect caused by [positive emotions](#) requires this period of consolidation during sleep.

"Emotion is a direct gateway into memory storage," says dr. Luis Fuentemilla, a researcher at IDIBELL-UB and the last author of the study. "Therefore, we can bias the acquisition of present and future memories based on the incorporation of emotional content thanks to our brain's ability to integrate information." A therapeutic level, Oyarzún concludes, "this ability of selective acquisition could eventually be applied to patients with memory or learning difficulties to enhance long-term [memory](#)."

More information: Javiera P. Oyarzún et al, Motivated encoding selectively promotes memory for future inconsequential semantically-related events, *Neurobiology of Learning and Memory* (2016). [DOI: 10.1016/j.nlm.2016.05.005](https://doi.org/10.1016/j.nlm.2016.05.005)

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