FENS 2020 Virtual Forum
11-15 July 2020
Organised by the Federation of European Neuroscience Societies (FENS)
Hosted by the British Neuroscience Association (BNA)

12th FENS FORUM OF NEUROSCIENCE

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PRESS RELEASE
EMBARGOED UNTIL SUNDAY 12 JULY 2020, 14:30 BST

MANIPULATING MEMORIES TO OVERCOME ANXIETY

Anxiety disorders are associated with dysfunctional memories. Scientists in Argentina have been investigating how memories are formed based on cues that a human or animal predicts to be a threat, so-called 'threat conditioning.' In a new approach to the underlying biology of forming fearful memories, they found that when the threatening memory was manipulated, the fear diminished in a single intervention. This new knowledge of the neural processes involved in memory formation could help in the treatment to overcome the anxiety that follows a traumatic event.

"We can think, figuratively speaking, that memories are closed boxes. A particular life-event can open one of those boxes, and for some hours, it is possible to change or modify its content before closing the box again. In the neurobiological field, opening the box is known as labilisation, the life-event as a reminder and the reorganisation of the content as memory formation – or reconsolidation," said **Dr Maria Pedreira from the University of Buenos Aires** said today (Sunday 12 July).

In psychology, there are two lines of thought about the consequences of modifying memories. "One is that the modification updates the memory based on the person's or animal's current environment and circumstances. The other suggests that the process strengthens the original memory. Therefore, the anxiety is reinforced. We now believe it is the latter that keeps people in a state of anxiety," she explained.

In a series of memory tasks in her laboratory, Dr Pedreira showed people images of faces with different emotional expressions in combination with a naturally aversive stimulus tone (an annoying noise) that would normally stimulate a response. This is known as a 'threat conditioning'. They found that the memory impacted differentially on cognitive levels, changing behavioral responses and over-estimating potential threats. They found that interfering [by another demanding memory task] with the threat- memory reconsolidation, not only weakens this memory but also the behavioural and cognitive responses associated with fear processing, such as over-estimation of threat and their consequences.

"We demonstrated how traumatic memories are strengthened and why some memories persist, despite being manipulated to ease the fear. So we think that dysfunctional memory updating may be a mechanism involved in the persistence of anxiety disorders," she told delegates at the FENS Virtual Forum of Neuroscience.

Further experiments are needed to explore the neural circuits that contribute to the inability to reduce anxiety. The research demonstrates that modifying emotional memories is a simple and safe intervention. In experimental psychology, experiments with healthy

participants could disentangle the relationship between the implicit memories and cognitive systems.

"Our research shows for the first time the possibility of weakening both the threatening memory and the systems associated with persistent anxiety. "We obtained promising results with healthy subjects. However, future research may shed light if these effects may be obtained also in subjects with different anxiety profiles," said Dr Pedreira.

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Symposia S11: The transience of memory: mechanisms underlying memory destabilisation and updating
Abstract: Following the footprints of reconsolidation process: its role in memory persistence

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The 12th FENS Virtual Forum of Neuroscience
As a consequence of the COVID-19 pandemic, the FENS Forum 2020 will be held entirely virtually.

The FENS Forum of Neuroscience is the largest basic neuroscience meeting in Europe, organised by the Federation of European Neuroscience Societies and hosted by the British Neuroscience Association. It will attract around 5,000 international delegates. FENS was founded in 1998. With 44 neuroscience member societies across 33 European countries, FENS as an organisation represents 20,000 European neuroscientists with a mission to advance European neuroscience education and research.