

Tetris, trauma and the brain

Adapted from an article by Tom Feilden

- 1 Imagine a world in which we could wipe the slate clean. No, not undo the damage our actions had caused, but rather erase painful memories of the past. It may seem like the stuff of science fiction, but researchers have made great progress in recent years in understanding the neural processes and bio-chemistry involved in memory formation. So much so that some are beginning to talk about cures for phobias and treatments for post-traumatic stress disorder (PTSD).
- 2 In her work on PTSD at Oxford University, Dr Emily Holmes is no stranger to haunting imagery, or the harm such vivid flashbacks can inflict. In a remarkable experiment involving footage taken at the scenes of car crashes, Dr Holmes is using the computer game Tetris to disrupt the processes in the brain involved in laying down painful memories, dramatically reducing the impact of recalled trauma. "The biology of memory suggests you've got about six hours after a traumatic event while that memory solidifies," she says. "What we wanted to find out was whether we could do something to disrupt that process of memory formation".
- 3 Dr Holmes played clips of traumatic events to 40 volunteers. While one group was asked to sit quietly after viewing the films, another played the computer game Tetris. The results showed that the volunteers who played Tetris experienced about half as many flashbacks as the control group, and that those memories were less vivid or disturbing. The point about Tetris, Dr Holmes concludes, is that it employs many of the same areas of the brain – to do with visual processing and coordinating thoughts and actions – that are involved in laying down memories. "Disrupting those functions by diverting the brain's attention in this crucial six-hour window seems to dampen down the vividness of memory", she explains.
- 4 But knowing which areas of the brain are involved in laying down memory tells you little about the bio-chemical processes involved. To understand this, Dr Todd Sacktor and his team at the State University of New York have been investigating the glue-like role that a particular protein – known as KPM-zeta – plays in the consolidation of memory at specific links between neurons in the brain. By interrupting the process with another drug – called Zip – Dr Sacktor's team was able to erase the memory of a mild electric shock in rats. It's the first step, Dr Sacktor claims, in chemically controlling unwanted or intrusive memories. "The key thing is that once the drug wears off, which happens within a couple of hours, the memories never come back. So it seems to be a true erasing".

- 5 It's an exciting prospect. One which holds out hope of relief for those suffering from traumatic or unwelcome flashbacks. But what does it mean for our identity and humanity? The rights and wrongs of erasing memory will be debated by some of the leading researchers in the field at a debate organised by the Wellcome Collection. Speaking on the programme is Anders Sandberg from Oxford University. He feels nobody should object to efforts to help people suffering from serious psychiatric conditions like PTSD. The philosopher Anthony Grayling points out that we do erase some traumatic memories – ones which are simply too painful to face – naturally, but on the whole it matters tremendously that we should retain our memories, even the bad ones. We are what we are because of all the experiences we've had.

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Tekst 6 Tetris, trauma and the brain

- 1p 19 What becomes clear from paragraph 1?
People suffering from traumatic experiences
- A can make a new start in life if they are professionally brainwashed.
 - B have a better memory than those who are not similarly affected.
 - C may one day undergo successful treatment.
 - D should take part in extensive neurological tests.
- 1p 20 What has Dr Emily Holmes been doing, according to paragraph 2?
She has
- A designed a game to help victims of traffic accidents.
 - B established how much damage a traumatic experience can cause.
 - C extended the period of time in which memories are formed.
 - D tried to diminish the impact a traumatic experience can have.
- 1p 21 What is said about Tetris in paragraph 3?
- 1 Playing Tetris will improve your capacity to remember important things.
 - 2 The game Tetris has been developed to trigger specific processes that trick the mind.
- A Only 1.
 - B Only 2.
 - C Both 1 and 2.
 - D Neither 1 nor 2.
- 1p 22 What becomes clear about Dr Todd Sacktor in paragraph 4?
- A He doubts whether Dr Holmes' research will come up with any useful results.
 - B He is convinced that extensive tests on animals are necessary to get reliable data.
 - C He looks at the workings of the brain from a different angle than Dr Holmes does.
 - D He thinks that helping people overcome painful memories requires lifelong medication.

- 1p 23 How does paragraph 5 relate to the paragraphs 3 and 4?
- A It explains why the experiments mentioned in paragraphs 3 and 4 have been done.
 - B It gives further details about the experiments mentioned in paragraphs 3 and 4.
 - C It puts the experiments mentioned in paragraphs 3 and 4 in a broader perspective.
 - D It tones down the importance of the experiments mentioned in paragraphs 3 and 4.

“It’s an exciting prospect.” (eerste zin alinea 5)

- 2p 24 Geef van elk van de volgende personen aan of hij/zij het wel of niet eens is met deze uitspraak.

- 1 Dr Emily Holmes (alinea 2)
- 2 Dr Todd Sacktor (alinea 4)
- 3 Anders Sandberg (alinea 5)
- 4 Anthony Grayling (alinea 5)

Noteer het nummer van elke persoon, gevolgd door “wel” of “niet”.

Bronvermelding

Een opsomming van de in dit examen gebruikte bronnen, zoals teksten en afbeeldingen, is te vinden in het bij dit examen behorende correctievoorschrift, dat na afloop van het examen wordt gepubliceerd.