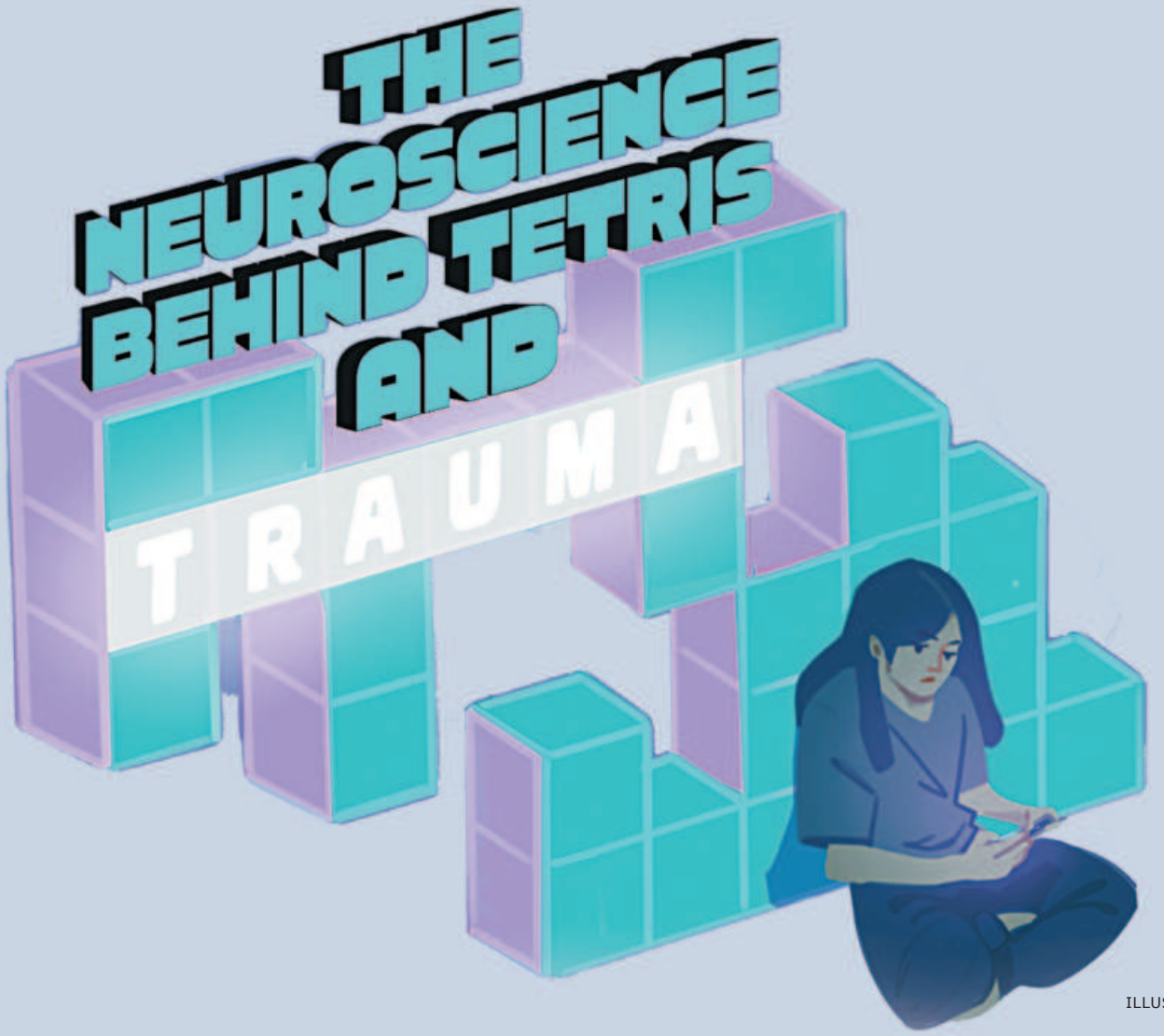
MENTAL HEALTH

THE NEUROSCIENCE BEHIND TETRIS AND TRAUMA



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Neon blocks fall down a dark screen as you mentally rotate them into place and chase the satisfaction of a clean line. You don't even notice that the minute hand completed a revolution while you've been playing like you're in an '80s arcade. Everything now is just a steady rhythm of shapes and decisions. If you've ever played the 1984 tile-matching game *Tetris,* you might recognise this feeling: the strange, hypnotic state where the game takes over your visual thinking, keeping your brain occupied with patterns and puzzles.

This trance isn't just a quirk of good game design but also a cognitive state. At that moment, *Tetris* is intensely occupying the brain's visuospatial system—the network responsible for forming mental images—and leaving less capacity for other imagery. According to an unexpected yet growing body of research, this mechanism may be powerful enough to interfere with how traumatic memories are stored.

Following a traumatic event, individuals often experience intrusive flashbacks, which are the hallmark symptom of post-traumatic stress disorder (PTSD). These are not merely thoughts but sensory memories considered to be distressing "visual replays" that force a person to re-experience the trauma. In the first few hours after trauma, a process called consolidation occurs, where the brain stabilises these new memories and files them long-term. During this period, the memory is fragile or labile and susceptible to interference. However, in later years, even well-formed memories can be placed into reconsolidation, in which they temporarily become malleable when triggered.

Tetris requires continuous mental rotations and spatial predictions to assemble the falling pieces together. It requires work from the visual processing system and uses the same cognitive resources involved in the formation of mental imagery. However, the brain has limited capacity and does not allow simultaneous processing of an unlimited number of visual imageries. Occupying the visuospatial system with the demands of the game, *Tetris* creates a kind of mental traffic jam that leaves little room for other visual memories to take hold.

Playing *Tetris* during the consolidation window—usually within six hours after the traumatic experience—causes a competition between two processes for the same resources. By busying the visual processing system, *Tetris* limits the capacity for forming traumatic memories. As a result, the intensity of the visual memories decreases greatly. It is important to note that this method does not imply the erasure of the memory or recollection of the facts involved in the incident. Instead, it focuses on weakening the pathological flashbacks that cause the worst PTSD symptoms.

There is extensive research conducted in various places that goes beyond mere theoretical analysis. Studies carried out through clinical trials, including those at the University of Oxford, found that patients involved in car accidents were less likely to have intrusive memories within one week after playing *Tetris* in the emergency room than their counterparts undergoing normal treatments.

A 2023 University of Cambridge study focused on healthcare workers during the pandemic found that those using a guided *Tetris* intervention reported 10 times fewer flashbacks, insomnia, and anxiety after one month compared to control groups. Other studies have found similar effects across different groups, including women experiencing birth trauma and refugees fleeing war. There is also early evidence that such interventions may have broader effects. Some studies involving combat veterans have linked *Tetris*-based therapy to reductions in anxiety and depression, and even to changes in brain regions associated with memory, like the hippocampus. However, this area remains under investigation. Lab-based research and case studies show that the "Tetris effect" can work even days or years later. By having a person recall a specific trauma memory before playing, researchers use the reconsolidation principle to destabilise the old memory and then interfere with its storage once more.

Importantly, *Tetris* is not a cure for PTSD. It does not address all symptoms or replace established treatments like trauma-focused therapy. Research into using *Tetris* for established PTSD through reconsolidation is currently ongoing and promising, yet it remains experimental and isn't a replacement for professional therapy like cognitive behavioural therapy (CBT) or eye movement desensitisation and reprocessing (EMDR).

What makes this approach potentially revolutionary is its simplicity. *Tetris* is widely available on smartphones, free, and easy to use. Unlike traditional therapy, it doesn't require specialised clinicians or victims to talk in painful detail. It can be deployed in emergency rooms, disaster zones, or low-resource communities where mental health care is scarce and reduce the impact of trauma before it fully takes root. Ultimately, a simple game of falling blocks has inspired a research body leading a novel shift in how we respond to PTSD.

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