Sana Qadar

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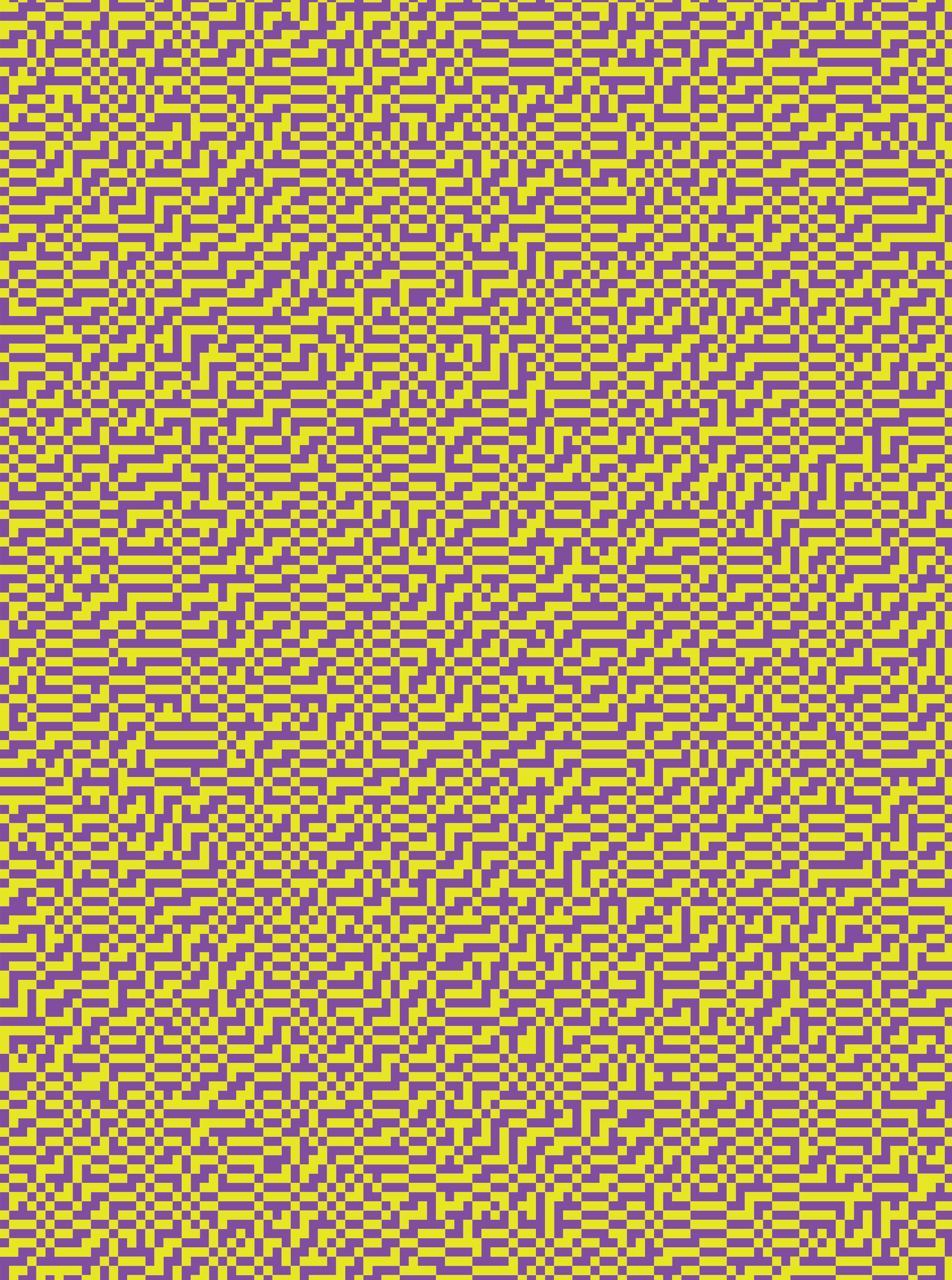
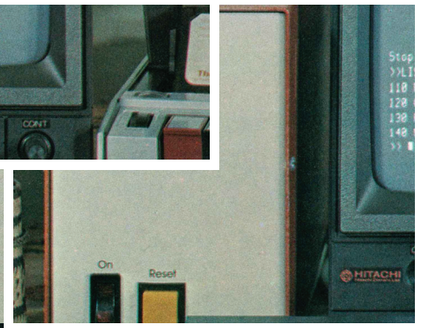
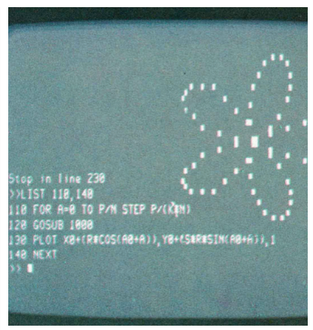
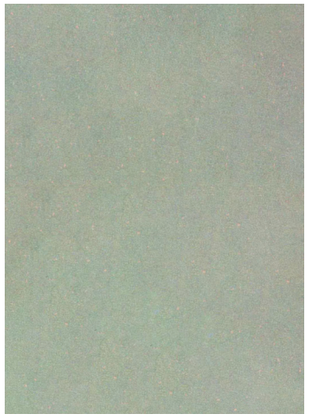
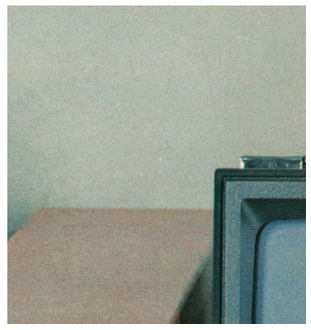
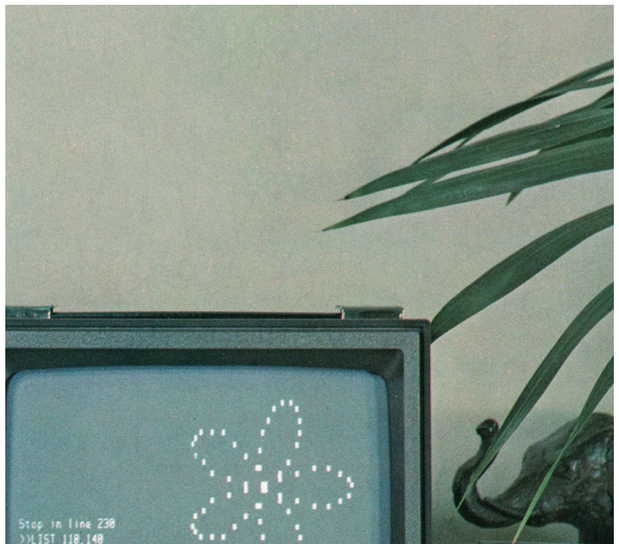








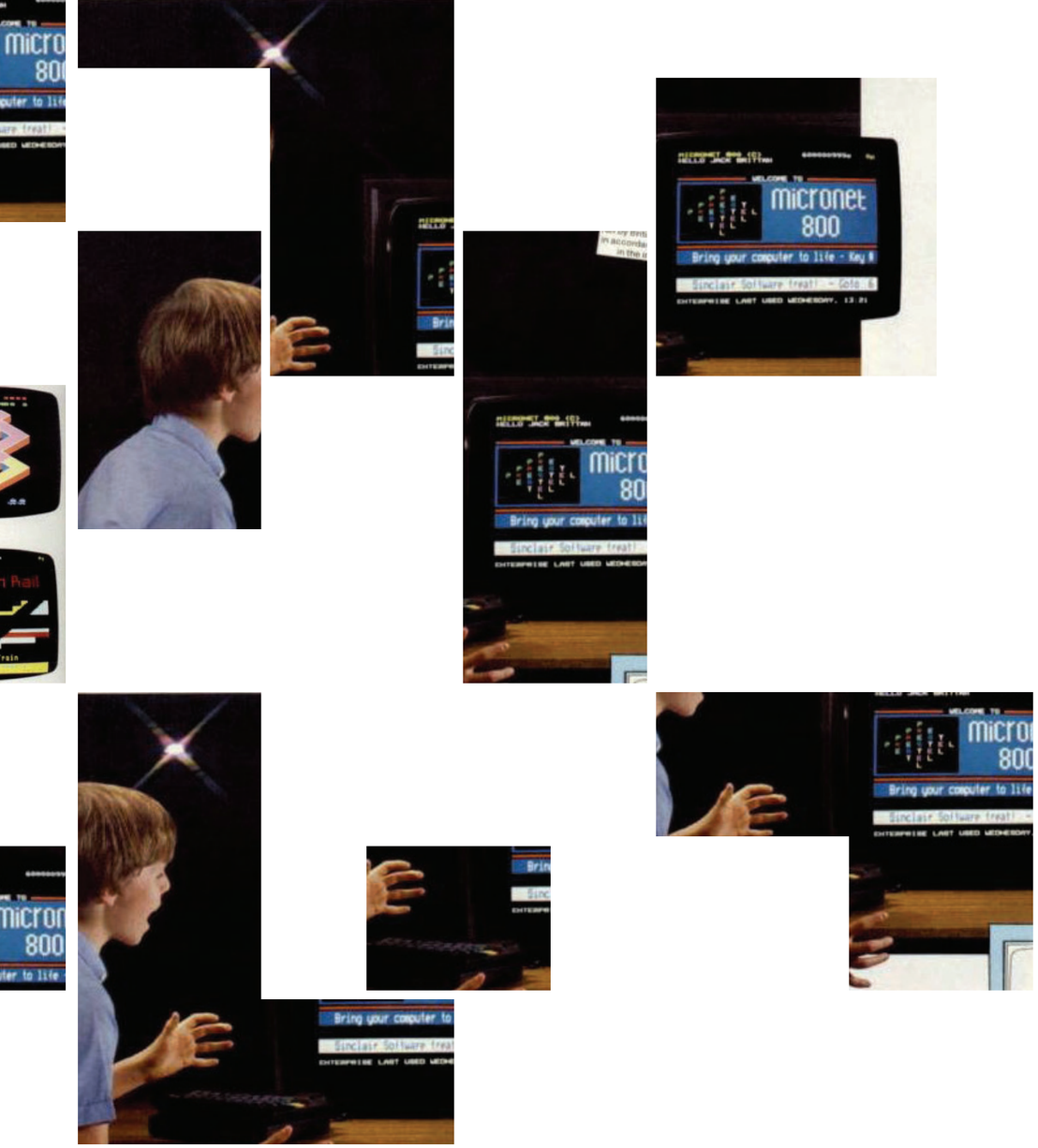




Why People Are Playing Tetris To Treat Their Trauma

July 27, 2024

Podcast By Sana Qadar



Sana Qadar: When was the last time you played Tetris? That smash hit puzzle game that came out in the 80s which remains one of the most popular video games out there. Just in case you didn't know, Tetris is a game where you have to stack blocks as they fall from the top of the screen. They're in different shapes so you have to make them fit together and you do this faster and faster until you can't keep up.

Charlie: There's so much strategy and looking ahead. You want to clear four rows at once and that's called a Tetris. You know, that gives you the most points.

SQ: It can be a real mental workout, which is why Tetris is not just a video game, it has also become a therapeutic tool.

Emily Holmes: We just started having discussions about, oh, I wonder if there are any tasks that are less formal than these kind of psychology experimental, boring tasks like tapping a keyboard.

SQ: I'm Sana Qadar, this is *All in the Mind*, and over the next two episodes, producer Shelby Traynor is going to find out about the weird ways that Tetris can change the brain. Part One, Trauma and Tetris. Hello, Shelby.

Shelby Traynor: Hello.

SQ: What on earth do trauma and Tetris have to do with each other? Because that is such an unexpected link.

ST: It is a bit of a weird link. It's not the first thing that you think of when you're sitting down to play a video game, that it might be a therapy. But when you actually get into it, it starts to make sense. When you actually get into what's happening in the brain, that is.

SQ: Before we get into how that all works, are you a big player of Tetris?

ST: Yes. I love Tetris. I go through phases, to be honest, and because of this story, I've been playing it pretty much every night.

SQ: Oh my gosh, wow.

ST: How about you?

SQ: No, I don't remember the last time I played Tetris. I would have been a child. I've definitely played it in my life, but not recently.

ST: Well, maybe this episode will inspire you. But to tell this story, we do have to venture away from video games for a moment, I'm sorry, and talk about some difficult stuff. We all go through it, but for some people, the traumas they experience can stick around in unhelpful and unhealthy ways.

C: I did not want to go back to my regular life because I had to accept that something had happened.

ST: For Charlie, this was one of those times when it felt like the world should stop.

It's not the first thing that you think of.

C: I wanted to just sit and allow myself to process how I wanted to. I just wanted to stay where I was and just be overrun by how I was feeling.

ST: This was 2023, and Charlie knew there was nothing wrong with letting her feelings consume her. She just lost her dad in really difficult circumstances.

C: You know, I should be in this state of just grieving, but I was having this problem.

ST: Charlie could tell even then that she was experiencing something other than grief.

C: I was seeing my dad's face every time I'm closing my eyes to go to sleep, I saw it.

ST: These flashbacks were a sign she was also experiencing post-traumatic stress disorder. And looking back, there were aspects of the experience that made her more susceptible. Charlie's dad was often in and out of hospital, but the events leading up to his death were difficult for her to comprehend. One week he was fine. The next he had dementia-like symptoms from swelling in the brain.

C: And I had visited him two weeks before. He was absolutely normal. So to go from absolutely normal to having dementia within two weeks, and actually it was more like two days.

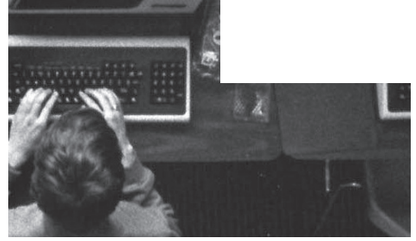
ST: There were also decisions made during his hospital admission that Charlie is still coming to terms with, like when he was moved out of the ICU only to collapse not long afterwards.

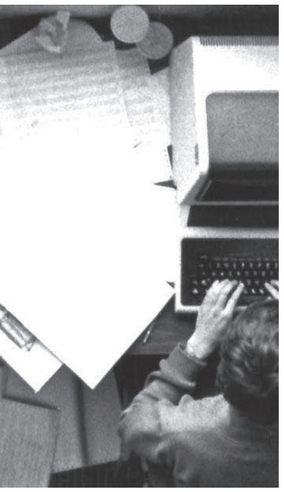
C: He went into cardiac arrest, was put back in the ER. I didn't know what was happening. And I walked into his room and he was on a ventilator asleep. You know, no one had told me. And I walk in and I'm in shock. I'd never seen him on a ventilator before. He couldn't open his eyes. He couldn't breathe by himself. It was just horrifying.

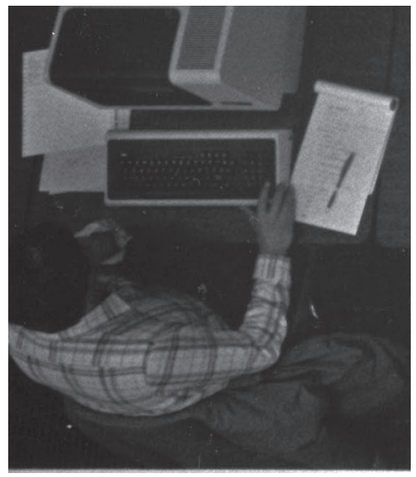
ST: We know that flashbacks can happen to anyone. They don't just emerge after one big event. There are quieter traumas that can have a big impact. One of the risk factors for PTSD is a sense of helplessness. And there were plenty of times Charlie felt helpless during this experience with her dad.

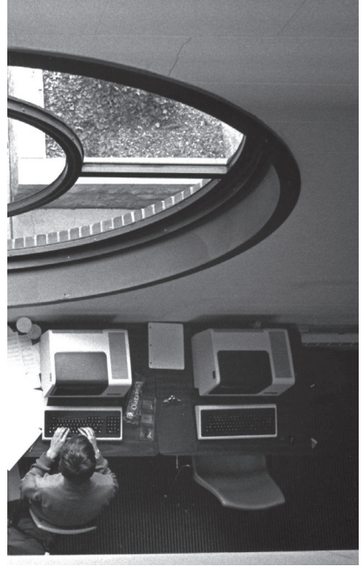
C: They would be poking and prodding and the systems were going off. And I was there for 12 hours a day for a week. In fact, I only missed one day because my sister was saying he was getting a lot better and that was the day before he coded. So I actually missed the last time he ever spoke to anybody.

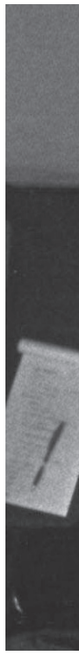
ST: Another risk factor is rumination. Looking back and wondering whether something could have gone differently to change the outcome. If they'd kept him in the ER, if they'd picked up on his symptoms sooner. Nonetheless, it became apparent what the outcome would be.

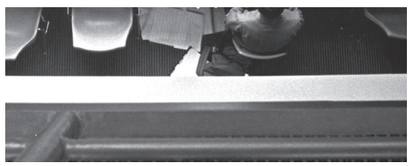




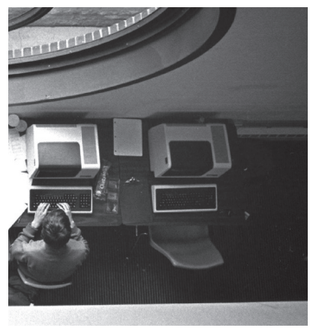








C: We had to make that decision that, you know, he's probably not going to live. And if he does, his quality of life, it was already not great to begin with before he was in the hospital. And it was going to be basically non-existent at that point. So we gathered together and at sunset, which was a very special time of the day for my stepmother and my father, sunset, they decided to pull the plug. We played some music for him and, you know, that was that.



ST: When something like this happens, it can be doubly traumatic to realize the world doesn't stop. That while you're grieving an indescribable loss, the day to day continues. Your life may have shut down for a time—

C: But, you know, eventually you have to go back to your life.

This wasn't an image that Charlie was recalling on purpose. This was a flashback that came on whenever and wherever.

ST: This wasn't an image that Charlie was recalling on purpose. This was a flashback that came on whenever and wherever. And it wasn't just the image that came on either. It was the panic, helplessness and guilt that she'd experienced in the last days of her dad's life. All powerful emotions that Charlie didn't seem to have any control over.

EH: After traumatic events, many people are going to be fine. But we also know that some people aren't.

ST: This is Emily Holmes, a professor of cognitive neuroscience and a clinical psychologist.

EH: My work is particularly curious about mental imagery. Imagery has a special relationship with emotion. Even if they're only milliseconds, those milliseconds can be very powerful and impact you just like seeing a real thing can.

ST: Mental imagery encompasses flashbacks, but also memories, dreams and imagination. Most of the time, it's a very useful skill.

EH: One thing it might do for us is allow us to mentally time travel. If we're sitting here now, you're in your evening, I'm in my morning, we're both planning what are we going to do in the next few hours, you can imagine, ah, when am I going to have my next cup of coffee? Or you could imagine, I've got to travel from A to B. So part of it is the ability to simulate the world and travel in time. And that's essential. I think it's also a way to travel backwards in time and learn from things, reflect on what happened yesterday. How can I learn from that to visualize that?

What's happening in the brain there?

ST: There is a wide spectrum of troubling mental imagery too, from anxious imaginings to nightmares and flashbacks.

EH: When we're talking about what we might call flashbacks or intrusive memories after a traumatic event, they're on the perhaps more extreme end of the imagery spectrum, because they can be particularly vivid. And they can carry a lot of distressing emotions with them.

ST: This is where flashbacks differ from memories you might choose to recall. Flashbacks are sudden. They can be triggered, yes, but they can also happen unbidden. And when they do, they have a tendency to pull you out of the moment you're in and send you back to the traumatic event.

Grief alone would have been enough for Charlie to deal with. But on top of that, this is where the flashbacks started. Whenever she closed her eyes, she would see her dad's face, the way he was in the hospital.

C: As you can imagine having a ventilator in for multiple days, you're not going to look too hot, especially when you have all this fluid retention. You cut your whole body swells up. And I would close my eyes and it's all I could see. I wasn't seeing the face that I knew. I was seeing something that was genuinely frightening to me. And I did not know what to do.

ST: This is where flashbacks differ from memories you might choose to recall. Flashbacks are sudden. They can be triggered, yes, but they can also happen unbidden. And when they do, they have a tendency to pull you out of the moment you're in and send you back to the traumatic event.

SQ: Do we know why that's happening? What's happening in the brain there?

ST: There is a theory on what's happening during a traumatic flashback. It's still a theory, but it's a strong one. And it's basically when you experience something traumatic, the way that that memory is stored, something's going wrong there. It's not storing properly. So when you're having a flashback, they've seen on fMRI scans that the things that are going on in the brain are just different than if you were having a regular memory. The visuospatial area of your brain lights up a lot more. It's a lot more activated. It's kind of as if you're seeing that thing again. It's happening again. You're right back there.

SQ: Oh my gosh. And so, okay, what does Tetris have to do with all this? Where does Tetris fit in?

ST: Well, like I said, the visuospatial part of the brain lights up with a flashback. You can imagine with Tetris being colorful and you've got the theme song in the background and it's all very distracting. That part of the brain lights up just as much.

SQ: Right. Okay. So it works as a distraction.

ST: It is a really good distraction, but there's also something else going on. And this is where Professor Holmes's work comes in.

EH: If, for example, you were having nightmares of your plot plant and I wanted to dampen those down, what I want to do is slightly erase the vividness. And your brain can't do two things at the same time at once. So you can't both have a really vivid image of your plot plant and play Tetris because Tetris also involves color, shape, form, and motion. So it's as if your brain's got a limited, at least in the visuospatial domain, has a limited capacity. You can't imagine two things at once at the same time. So by doing the visuospatial task, you're taking away the richness with which you can imagine the plot plant.

SQ: Right. So that sounds really similar to how something like EMDR works, which is the trauma therapy where you're either tapping yourself while you recall a traumatic memory or you're flitting your eyes side to side. And the idea there is essentially that while you're recalling that memory, you're distracted by doing that other thing, so it's not as intense.

ST: Yeah, exactly. And that's kind of how other trauma therapy will work as well. So some people do trauma reprocessing, journaling with a therapist. And what they do is they bring back up that memory and then as they're writing and the therapist is talking to them, it's not as vivid. They knew that this was a thing before. They'd done other lab studies where if you'd simply tapped under a table while you were recalling a traumatic memory, it would reduce the vividness. But like tapping under a table is really boring. Playing Tetris is a lot more fun. So they decided, hey, Tetris is available in people's phones, in their back pocket. Let's see if we can test this in a lab setting.

SQ: Oh, wow.

EH: So the way we study that in the laboratories, we have to set up a simulation of an experience that will create intrusive memories. We show people films that have distressing content and that for some people at least, they create briefly intrusive memories.

ST: So in this study, half an hour after watching the film, participants were asked to recall a distressing part of the film before either playing Tetris or sitting quietly. Both during this post film period and for a week afterwards, the people who played Tetris experienced fewer flashbacks than those who didn't.

EH: So that was really promising, a good first step showing that we could use something that was less like a lab task and more like a real world task to modulate people's intrusive memories.

ST: The question after this first lab study was whether it would work in the real world when faced with real world traumas. This was the point of a follow up study in 2018.

EH: The idea was to give people the opportunity to do the task procedure whilst they were waiting in the emergency department. I don't know what it's like in Australia, but in the UK, you can wait for hours to get help.

ST: They used the same technique as before. People were asked to recall the moment of trauma before undertaking the task on a handheld console. I imagine this being a strange thing to ask people in an emergency room, but Professor Holmes found they weren't all that bothered by the request.

EH: They might be surprised to be asked to do something, but actually the reaction can sometimes be very simple, like it's nice to do something to take my mind off stuff. The group of people who've been most surprised by this tend to be psychologists. They often say, how could you ask to do something like playing a game after something so awful's happened? And that's a really valid question. But when you're there soon after trauma, actually people quite like having a thing to do and not everyone wants to talk about their trauma. And is something you can do rather than talk about.

ST: One man who'd been in a car accident said that while it was a bit strange at the time, looking back, it had been a help. Another lady wanted to keep playing after her 20 minutes were up. But this doesn't mean the intervention is all fun and games. It can be a difficult thing to do.

EH: Because it's a big deal. It's not just about playing a game. It's also about having to do this procedure where you bring something, even if it's very briefly, just a couple of seconds, you're bringing a nasty memory to mind. And that's really hard. It's hard to talk about trauma. It's hard to recall trauma.

ST: Which is why, while the results of these studies are promising, you shouldn't be firing your therapist and downloading Tetris. It's an intervention, not a treatment. And it might still be hard to reach for, no matter how fun it is or how much evidence you hear about its effectiveness. That was Charlie's experience when she lost her dad. She knew Tetris could help, but she still found it tough to play the game while grieving.

Sana Qadar, 2024

C: Tetris is such a big part of my regular life. I mean, I play it like, you know, before class, do a little thing. Before bed, I'll play a little bit. And it was like a piece of me that was part of my regular life. And I just did not want to return to that.

ST: When she started experiencing flashbacks, Charlie already knew about Professor Holmes's research. She'd heard about it years earlier when she first got into competitive Tetris.

SQ: Shelby, what is competitive Tetris?

ST: Okay, I'm very excited to get into this. Just a pause from the trauma, we'll talk about competitive Tetris for a bit. So competitive Tetris, a lot of people would have first heard about competitive Tetris back in January when a 13-year-old broke the game.

SQ: Okay, hang on. First of all, I missed that newsflash. And how do you break the game? What?

ST: Basically, there's no way to beat Tetris. There's no programmed ending. Because the blocks just fall. And they just keep falling faster and faster and faster. And how could you ever beat that? It can just keep getting faster.

SQ: Right.

But this doesn't mean the intervention is all fun and games. It can be a difficult thing to do.

It's a whole nother world.

ST: But no, you can beat it. It just freezes. And that's what it means to beat Tetris. You basically hijack the software. The software freaks out, and it crashes.

SQ: So you fitted your blocks quick enough that Tetris is like, okay, you beat us.

ST: We haven't programmed any more levels, we don't know what to do with you... Crash.

SQ: Right.

ST: I'd really suggest going and watching that video in particular, but also just any video of a top level Tetris player. It's very intense. And this is what drew Charlie in.

C: I was looking on YouTube. This is around mid 2018. And I came across a video that said, Classic Tetris World Championship Finals 2016. And I was like, okay, I'll click on this. It's the summer. I'm in high school, whatever. And I watch it and I'm just, wow, this is so strangely mesmerizing. And from that moment, I was absolutely hooked. I loved it. It kind of consumed my life.

ST: A lot of these competitions are paired with running commentary and terminology that can be tricky to keep up with. You have things like T-spins, spin clears and cleanups. They also specifically play the 1989 version of the game using cathode ray tube video displays. Basically an old boxy TV. It's a whole nother world.

C: You watch it and you say, wow, well, there is a lot more to this game than I originally thought because, you know, you see the Tetris pieces falling. You're like, okay, where can I put them?

But there's so much strategy and looking ahead. People hold the controllers and play like ways you wouldn't even imagine. It's also really nerve wracking. You see people get out of these situations so high up in their brains just goes so fast and they just know how to problem solve.

EH: And what good Tetris players often do is that they see the block that's next and they start to imagine where to place it to most easily create a row.

ST: This forward thinking is actually what gives Tetris and games like it their brain changing power.

EH: That idea of moving a block, rotating it in your mind's eye and putting it somewhere is part of a process we call mental rotation. And that's very different. You could actually play Tetris by swiping and plopping at the screen like the way you might see a child play Tetris or when it doesn't have much time you go chick, chick, chick, chick.

ST: But if you're using the video game as a trauma tool, Professor Holmes says you should really be focusing on that mental rotation. Looking ahead and visualising where a piece might go.

EH: The point in the task isn't really to win or to get a high score. It's simply Tetris as it were as a way to get a really good mental workout of rotating things again and again and again. And that's important because that really uses that kind of visual spatial part of your brain that we want to engage.

ST: In order to be so vivid, flashbacks need to use the same visuospatial networks that are busy trying to help you get a high score. It did take a while for Charlie to come back to Tetris. This wasn't a new task for her. It represented a return to normality.

C: You just want to sit there and be sad sometimes. That's okay to do that for a little bit. But there's some point where you have to get up and okay, I need to help myself now. And that's what I had to do. And I was pretty intentional with it because I was like, I would do anything to not see this when I close my eyes. I just want some peace because it was just troubling and I couldn't sleep. And so I played and I really did see a lot of improvement. Of course, things are going to pop in your head and it's not going to be a fix-all solution. I'll just play some dang Tetris for a little bit. But I wasn't having as many intrusive thoughts.

The goal is that that flashback will then be restored, less vivid, and she'll get fewer flashbacks.

SQ: That's really interesting. So I understand how playing a video game would stop flashbacks while you're doing that activity. But what happens when you're not?

ST: Well, like I said about the reconsolidation of memories and how in PTSD those memories aren't consolidating properly. Basically, the goal is to consolidate them properly through this Tetris technique. So what Charlie was doing when she says she was very intentional about it is she's bringing up the flashback and then she's playing Tetris. And the goal is that that flashback will then be restored, less vivid, and she'll get fewer flashbacks, which is what Professor Holmes found in her emergency room experiment.

EH: If we compared the patients who had been waiting, who'd done the intervention, so recalled the bits of their trauma, did mental rotation, played Tetris versus an active control group, people who just got a log of what they were doing in the hospital had another task to do. Those who did the imagery competing task procedure, including Tetris, had far fewer flashbacks in the week after they were discharged from the emergency department. And in fact, I think the results were even numerically slightly bigger than that in the lab. So yeah, that was a really, really promising first result to get.

ST: Despite the success of Professor Holmes' research in 2009 and 2018, there's something I didn't mention. In both of those earlier studies, the participants were playing the video game shortly after experiencing the trauma. But we know that PTSD doesn't just develop after a single traumatic event. It can be cumulative. And for some people, they may regularly experience distressing events as part of their day-to-day lives. Professor Holmes wanted to know whether this Tetris intervention might help in those situations.

Something so simple, yet so all-consuming.

EH: We have published a couple of studies recently with longer term traumas, not only soon after trauma, but using the technique also, actually with healthcare workers working in the pandemic who are exposed to trauma a lot in their line of work. They're exposed to enormous amount of trauma during the pandemic were developing flashbacks.

ST: A randomized control trial in ICU staff found that over the four-week study, those who played the video game had far fewer intrusive memories than those who didn't. This was also something they could do in their own time as much as they needed.

EH: If someone's willing to do it, you can guide them to do it once and then they can go off and do it on their other ones. And that's quite useful in a situation like, say you're working in a pandemic, you're going to have new traumas happening. So then they can use it by themselves if they get another one.

ST: This Tetris technique also seemed to have an effect on other symptoms like anxiety. And while not everyone has time to drop everything and play 20 minutes of Tetris, the study did also find the players were more engaged in work and had a lower burnout rate. I spoke to someone who's been using Tetris for these very reasons for much of his life.

Scoops: My name is Erling Oster. My name in the community is Scoops.

ST: He's another dedicated Tetris player. And yes, a lot of people go by their usernames in competition. But outside of that world, Erling has been using the video game in much the same way Professor Holmes would recommend for someone who is repeatedly exposed to intense situations.

S: I'm a trial attorney. I do criminal law and I see the ugliness of humanity every single day, all day often. And so for me, it's a great escape as well, where my brain, which is, I find hard to turn off, it can be active. But the result is not, does somebody go to prison for the rest of their life? The result is, do I get a high score or not?

ST: But it's not just about dealing with distress from his job. Erling also uses Tetris to manage general stress and other mental health issues.

S: Throughout my life, Tetris was present in some capacity or another. I spent most of my 20s in active heroin addiction. And so when I recovered from that, went to law school and became a lawyer. I believe some of those addictive traits manifest themselves in my Tetris life.

ST: I'm sure many people would attest that the game has addictive qualities. It's colorful. It's got just enough promise and uncertainty to keep you hooked. But it can help people manage cravings for other addictions. One study found the game could reduce drug cravings. And not only that, but cravings for alcohol, nicotine and sex. Now, this isn't entirely different from the mechanisms behind reducing trauma flashbacks. Cravings can have a big visual component as well.

S: For me, I believe a lot of the addictive tendencies are satiated by Tetris, at least when I'm playing well. But it's also one of those things where, you know, I may say, all right, I'm going to play for an hour and then, you know, an hour and a half or two hours goes by because it does have that. Now, for me, when you look at full blown heroin addiction versus spending an extra couple hours playing Tetris, clearly it's a safer alternative.

ST: And Erling says it's just comforting to do something so simple, yet so all-consuming.

S: You can get better. Your skill matters. But no matter what, there's always going to be the randomness. And I think life is a lot like that.

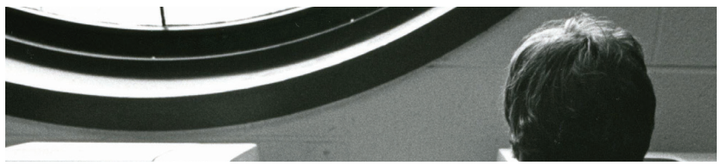
ST: You can shape the game, think ahead, hope for the perfect piece to come and rescue you from a bad decision.

S: You can do your best and live your best, but you can't account for everything. The lack of sounding like overdramatic, there's a certain mirror to life that I find in the game.

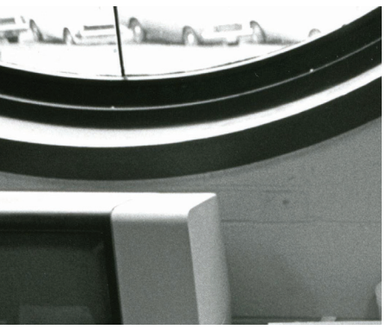
You can get better. Your skill matters. But no matter what, there's always going to be the randomness. And I think life is a lot like that.

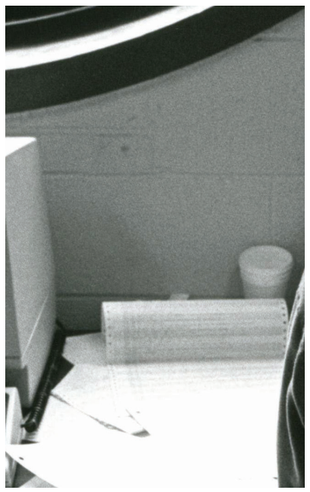
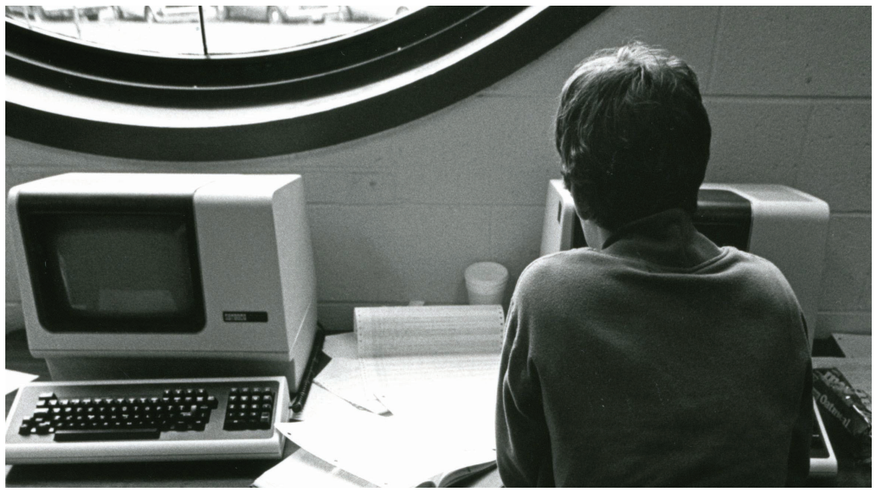










ST: We're not entirely in control of everything in Tetris and in life, but the game has shown that we have more control than previously thought of the images and the memories that play in our mind's eye.

EH: We can play them forwards, re-script them, transform them. So I hope we're at the start of what will be a really long scientific and clinical journey for many people trying to find new imagery-based methods, really.

ST: Charlie is glad to no longer be experiencing flashbacks every time she closes her eyes. And she's grateful she eventually turns to her favourite video game to help.

C: It's okay to, when something bad happens, to just want to live in that for a little bit. But there's things out there that you like to do and you've got to, whether it is Tetris, something that's scientifically proven to help you, or things that, you know, give you something to do. It's important to do those things because, you know, I was sitting there just wanting to live the rest of my life like my dad had just died an hour before. And I can't do that. I have a job, I have class, I have a cat, I have friends and a boyfriend, and I mean, it's horrible. And there's times where no matter how much Tetris you play, no matter how much therapy you go to, you're going to have these things that pop up and you've just got to go through it, even though it sucks.

ST: When Charlie set out to use Tetris to help deal with her flashbacks, it wasn't about erasing her dad's memory in any way, but rather having more control over how and when she remembered him.

C: I mean, I've got my dad's urn right next to me, a picture of him. I've got a bunch of his clothes. The way I think about him is sometimes I'll just play the music that we played when we pulled his plug just to make myself sad for a little bit, just to, you know, remember things that made me happy, things that make me sad. And then you kind of, you turn off your car after crying very loudly into it and you get up and you say, OK, I'm going to go to Walmart now and get my groceries.