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VIRTUAL IRAQ

Using simulation to treat a new generation of traumatized veterans.

by Sue Halpern

MAY 19, 2008

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In November, 2004, when he was nineteen years old, a marine I'll call Travis Boyd found himself about to rush the roof of the tallest building in the northern end of Falluja in the midst of a firefight. Boyd, whose first assignment in Iraq was to the security detail at Abu Ghraib prison, had been patrolling the city with his thirteen-man infantry squad, rooting out insurgents and sleeping on the floors of abandoned houses, where they'd often have to remove dead bodies in order to lay out their bedrolls.

With Boyd in the lead, the marines ran up the building's four flights of stairs. When they reached the top, "the enemy cut loose at us with everything they had," he recalled. "Bullets were exploding like firecrackers all around us." Boyd paused and his team leader, whom he thought of as an older brother, ran past him to the far side of the building. Moments after he got there, he was shot dead. Within minutes, everyone else on the roof was wounded. "We had to crawl out of there," said Boyd, who was hit with shrapnel and suffered a concussion, earning a Purple Heart. "That was my worst day."



The program uses sights, sounds, even smells to evoke, and subdue, painful memories.

KEYWORDS

Virtual Reality; Virtual Iraq; Veterans; U.S. Soldiers; Psychotherapy; Post-Traumatic Stress Disorder (P.T.S.D.); Iraq War

Annals of Psychology

It is in the nature of soldiers to put emotions aside, and that is what Boyd did for three years. He “stayed on the line” with his squad and finished his tour of duty the following June, married his high-school girlfriend, and soon afterward began training for his second Iraq deployment, not thinking much about what he had seen or done during the first. Haditha, where he was sent in the fall of 2005, was calmer than Falluja. There were roadside bombs, but no direct attacks. Boyd was now a team leader, and he and his men patrolled the streets like police. When drivers did not respond to the soldiers’ efforts to get them to stop, he said, “we’d have to light them up.” He was there for seven months.

With one more year of service left on his commitment, and not enough time for a third deployment, Boyd was separated from his unit and assigned to fold towels and clean equipment at the fitness center of his Stateside base. It was a quiet, undemanding job, intended to allow him to decompress from combat. Instead, he was haunted by memories of Iraq. He couldn’t sleep. His mind raced. He was edgy, guilt-racked, depressed. He could barely do his job.

“I’d avoid crowds, I’d avoid driving, I’d avoid going out at night,” he told me the first time we spoke. “I’d avoid people who weren’t infantry, the ones who hadn’t been bleeding and dying and going weeks and months without showers and eating M.R.E.s. I’d have my wife drive me if I had to go off the base. A few times, I thought I saw a mortar in the road and reached for the steering wheel. I was always on alert, ready for anything to happen at any time.”

Eventually, as part of a standard medical screening, Boyd was diagnosed as having chronic post-traumatic stress disorder. P.T.S.D., which in earlier conflicts was known as battle fatigue or shell shock but is not exclusively war-related, has been an officially recognized medical condition since 1980, when it entered the American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders. (In an earlier edition, it was called “gross stress reaction.”) P.T.S.D. is precipitated by a terrifying event or situation—war, a car accident, rape, planes crashing into the World Trade Center—and is characterized by nightmares, flashbacks, and

intrusive and uncontrollable thoughts, as well as by emotional detachment, numbness, jumpiness, anger, and avoidance. Boyd’s doctor prescribed medicine for his insomnia and encouraged him to seek out psychotherapy, telling him about an experimental treatment option called Virtual Iraq, in which patients worked through their combat trauma in a computer-simulated environment. The portal was a head-mounted display (a helmet with a pair of video goggles), earphones, a scent-producing machine, and a modified version of Full Spectrum Warrior, a popular video game.

When Travis Boyd agreed to become a subject in the Virtual Iraq clinical trial, in the spring of 2007, he became one of about thirty-five active-duty and former members of the military to use the program to treat their psychological wounds. Currently, the Department of Defense is testing Virtual Iraq—one of three virtual-reality programs it has funded for P.T.S.D. treatment, and the only one aimed at “ground pounders” like Boyd—in six locations, including the Naval Medical Center San Diego, Walter Reed Army Medical Center, in Washington, D.C., and Weill Cornell Medical College, in New York. According to a recent study by the RAND Corporation, nearly twenty per cent of Iraq and Afghanistan war veterans are suffering from P.T.S.D. or major depression. Almost half won’t seek treatment. If virtual-reality exposure therapy proves to be clinically validated—only preliminary results are available so far—it may be more than another tool in the therapists’ kit; it may encourage those in need to seek help.

“Most P.T.S.D. therapies that we’ve seen don’t seem to be working, so what’s the harm in dedicating some money to R. & D. that might prove valuable?” Paul Rieckhoff, the executive director of Iraq and Afghanistan Veterans of America, said last November. In January, his group issued a lengthy report called “Mental Health Injuries: The Invisible Wounds of War,” which cited research suggesting that “multiple tours and inadequate time at home between deployments increase rates of combat stress by 50%.” Rieckhoff went on, “I’m not someone who responds to sitting with some guy, talking about my whole life. I’m going to go in and talk to some dude who doesn’t understand my shit and talk about my mom? I’m the worst of that kind of guy. So V.R. therapy, maybe it will work. We’re a

video-game generation. It's what we grew up on. So maybe we'll respond to it."

Strictly speaking, using virtual reality to treat combat-related P.T.S.D. is not new. In 1997, more than twenty years after the Vietnam War ended, researchers in Atlanta unveiled Virtual Vietnam. It dropped viewers into one of two scenarios: a jungle clearing with a "hot" landing zone, or a Huey helicopter, its rotors whirring, its body casting a running shadow over rice paddies, a dense tropical forest, and a river. The graphics were fairly crude, and the therapist had a limited number of sights and sounds to manipulate, but Virtual Vietnam had the effect of putting old soldiers back in the thick of war. Ten combat veterans with long-term P.T.S.D. who had not responded to multiple interventions participated in a clinical trial of Virtual Vietnam, typically lasting a month or two. All of them showed significant signs of improvement, both directly after treatment and in a follow-up half a year later. (P.T.S.D. is assessed on a number of scales, some subjective and others based on the observation of the clinician.) As successful as it was, though, Virtual Vietnam didn't catch on. It was an experiment, and when the experiment was over the researchers moved on.

Like Virtual Vietnam, Virtual Iraq is a tool for doing what's known as prolonged-exposure therapy, which is sometimes called immersion therapy. It is a kind of cognitive-behavioral therapy, derived from Pavlov's classic work with dogs. Prolonged-exposure therapy, which falls under the rubric of C.B.T., is at once intuitively obvious and counterintuitive: it requires the patient to revisit and retell the story of the trauma over and over again and, through a psychological process called "habituation," rid it of its overwhelming power. The idea is to disconnect the memory from the reactions to the memory, so that although the memory of the traumatic event remains, the everyday things that can trigger fear and panic, such as trash blowing across the interstate or a car backfiring—what psychologists refer to as cues—are restored to insignificance. The trauma thus becomes a discrete event, not a constant, self-replicating, encompassing condition.

This process was explained to me by JoAnn Difede, the director of the Program for Anxiety and Traumatic Stress Studies at Weill Cornell, when I visited her in her office, last fall.

Difede, a tough-minded New Yorker, began using virtual-reality exposure therapy with patients from the hospital's burn unit in the nineteen-nineties. She treated victims of September 11th with a program called Virtual W.T.C., which she designed with the creators of Virtual Vietnam, and is currently running a Virtual Iraq clinical trial as well as supervising therapists at other study sites. Difede says that therapists have been slow to adopt exposure therapy, because they worry that it might be cruel to immerse a patient in a drowning pool of painful memories. It's a worry that, she believes, misses the point of the therapy. "If you suddenly become afraid of the staircase because you had to walk down twenty-five flights of stairs to get out of the World Trade Center, the stairs went from being neutral to being negative," Difede explained. "What we should be doing is extinguishing the cues associated with the stimuli, which should allow for a more complete remission, as well as mastery of the experience. It also should allow for greater emotional engagement. Because numbing and avoidance are symptoms of P.T.S.D., you're asking the person to do in treatment the very thing their mind is avoiding doing. That's quite a dilemma." It's this dilemma that makes virtual reality especially attractive to clinical psychologists like Difede. Because the traumatic environment is produced in a computer graphics lab, and its elements are controlled by the therapist, virtual reality can nudge an imagination that is at once overactive and repressed. "Voilà, you're there!" Difede said. "You don't have to do any work. You don't have to engage in any mental effort. We'll do it for you. We'll bring you there and then, gradually, we'll let you get involved in the experience in sensory detail."

When Travis Boyd was first asked to consider enrolling in the Virtual Iraq clinical trial, he was hesitant. He had already decided not to talk to his division therapist, because "I didn't want to have it on my military record that I was crazy," he said. And he was a marine. "Infantry is supposed to be the toughest of the tough. Even though there was no punishment for going to therapy, it was looked down upon and seen as weak. But V.R. sounded pretty cool. They hook you up to a machine and you play around like a video game." Telling his buddies that he was going off to do

V.R. was a lot easier than telling them he was seeing a shrink.

Before he was introduced to Virtual Iraq, the therapist asked him to close his eyes and talk about his wartime experiences. Without much prompting, he was back on the roof in Falluja, under fire, stalled at the top of the stairs, watching his friend and team leader run past him and die, and then he was dragging out his friend's body, looking at his messed-up face. When Boyd was finished, the doctor asked him to tell the story again. And, when he was finished that time, to tell it again. As he did, she asked him what he was smelling, and if the enemy was on the roof opposite or on the roof next door, and if there were planes overhead. She wanted to learn the details of his narrative and determine which moments were most troubling to him—she called them “hot spots”—and to figure out how she was going to use the sensory variables embedded in Virtual Iraq.

Boyd was introduced to the V.R. program in the third session. (There were twelve sessions in all, each about two hours long, over a period of six weeks.) Virtual-reality exposure therapy immerses the patient gradually; that first time Boyd just sat there with the V.R. gear on, looking at an Iraqi street scene, getting acquainted with the virtual world. Sound, which psychologists believe may stimulate memory more effectively than sight does, was added next, and, with it, touch. “I’m talking about the firefight and she turns on this vibrating thing so you feel like you’re in a shaking building,” Boyd said. “Each time she added something, like an I.E.D. going off, or a plane flying over, I’d become more emotional. We’d do it over and over, and it would become easier, and then she’d add something more and the same thing would happen. I’d talk for forty minutes about this one five-minute thing. When it’s only visual, it’s not really real—it’s just a video game—but when the ground starts vibrating and you smell smoke and hear the AK-47 firing, it becomes very real. I’d be shaking. When it was over, I’d go home and cry.”

The inventor of Virtual Iraq is Albert Rizzo, a clinical psychologist at the University of Southern California, who goes by the nickname Skip. Rizzo, who is fifty-three, has thinning black hair that’s down to his shoulders when it’s not pulled back in a ponytail, a stud earring, and a

nose that looks like it has met a boot or two—he plays rugby. Rizzo rides a Harley 1200 Sportster (“It’s not a girl’s bike, no matter what anyone tells you”), plays blues harmonica (he taught himself a couple of years ago, in order to reduce stress when he was commuting daily in L.A. traffic), and has an affable, jeans-and-untucked-shirt way about him that is particularly noticeable when he walks through Walter Reed or the Naval Medical Center San Diego alongside his starched military counterparts. In 2003, not long after the United States invaded Iraq, Rizzo, who had been designing virtual-reality systems to diagnose attention deficits in children and memory problems in older adults, and was affiliated with the Institute for Creative Technologies, a U.S.C. offshoot that he likes to call “an unholy alliance between academia, Hollywood, and the military,” had a hunch that, if the war went on for very long, its veterans were going to come home with serious emotional problems.

“I thought we should be on this so we don’t have another Vietnam, with all these guys suffering from P.T.S.D.,” he told me one day last fall at Walter Reed, before he was to give a presentation to senior military officers. “I was working on a talk about virtual reality, just sniffing around the Internet, and I saw this link for the video game Full Spectrum Warrior.” The game had, in fact, originated as a training device that the Institute had developed for the Department of Defense. “I said, ‘Oh, my God, that’s Iraq!’ It was instant. I thought we should take this game and run it in a head-mounted display right out of the box, for therapy.”

Rizzo got in touch with Jarrell Pair, who had been the programmer on Virtual Vietnam, and convinced him to sign on to his as yet unfunded venture. By February, 2004, he and Pair had built a prototype of Virtual Iraq on a laptop, using a single street in an Iraqi market town which they had recycled from Full Spectrum Warrior. To this they added a few alternate realities that a therapist could insert with a keystroke—a change from day to night, for example, or a switch from a deserted street to one where burka-clad shoppers strolled down the sidewalk. “That was our demo,” Rizzo said. “We applied for money and we got nuked. Then the Hoge article comes out and everything changes overnight.”

The article to which Rizzo was referring was written by Charles Hoge and his colleagues in the Department of Psychiatry and Behavioral Sciences at Walter Reed and was published in the *New England Journal of Medicine* that summer. It was the first assessment of mental-health problems emerging from service in Iraq and Afghanistan, and even its conservative estimate—that around sixteen or seventeen per cent of those who fought in Iraq and eleven per cent who served in Afghanistan were suffering from P.T.S.D. symptoms (an estimate that four years later has been revised dramatically upward)—caught the public and the military by surprise. Then Rizzo got a call from somebody in the Office of Naval Research. “He says, ‘I hear you’ve got a prototype of Full Spectrum Warrior for P.T.S.D.,’ ” Rizzo recalled. “ ‘We’re going to try to get it funded.’ ” The money came through in March, 2005, and by the next fall, right around the time that Travis Boyd was being deployed to police Haditha, the first patients were recruited to try it out.

Before Skip Rizzo started designing virtual-reality systems, he was a conventional clinical psychologist, schooled in a variety of therapeutic methods. Rizzo grew up just outside Hartford, attended the University of Hartford as an undergraduate, received a doctorate from Binghamton University, and did his internship at the V.A. hospital in Long Beach, California, not far from where he now lives. Then he took a job as a cognitive-rehabilitation therapist at a hospital in Costa Mesa, working with people who had suffered traumatic brain injuries. “A lot of young males are in that population,” he said. “The high-risk-takers. The drunk drivers. Gang members—all of that. With that population, it was sometimes hard to motivate them to do the standard paper-and-pencil drill and practice routines. Then, in the early nineteen-nineties, Game Boys came on the scene, and it seemed to me that all my male clients, at every break, at every meal, had become Tetris warlords. It showed me that they were motivated to do game tasks, and that the more they did them the better they got, and it hit me that there could be a link between cognitive rehabilitation and virtual reality.” Rizzo left his job, and accepted a postdoc at the Alzheimer Disease Research Center at U.S.C., where he began to design rudimentary virtual-reality systems with the help of programmers in the

computer-science department. At the end of the postdoc, he moved to the engineering school at U.S.C. and started “building this stuff like crazy.”

To make Virtual Iraq, Rizzo started with two basic scenarios: the market-town street scene and a Humvee moving along an Iraqi highway, where all the exit signs are in Arabic and the road cuts through sand dunes. Then he gave therapists a menu of ways—visual, aural, tactile, even olfactory—to customize them. At the click of a mouse, the therapist can put the patient in the driver’s seat of the Humvee, in the passenger’s seat, or in the turret behind a machine gun, and the vehicle moves at a speed determined by the patient. Maybe the gunner in the turret is wearing night-vision goggles—the landscape goes grainy and green. A sandstorm could be raging (the driver can turn on the windshield wipers and beat it back); a dog could be barking; the inside of the vehicle could be rank. Rizzo’s idea is that giving the therapist so many options—dusk, midday; with snipers, without snipers; driving fast, creeping along; the sound of a single mortar, the sound of multiple mortars; the sound of people yelling in English or in Arabic—increases the likelihood of evoking the patient’s actual experience, while engaging the patient on so many sensory levels that the immersion in the environment is nearly absolute.

“Tell me what you want me to add, anything,” I overheard Rizzo asking a therapist at Walter Reed in February, a few days after she had completed a fourteen-session Virtual Iraq protocol in three months with the first soldier at the facility enrolled in the trial. (The patient didn’t think he had got much better, though he was able to ride the subway again and no longer avoided large crowds.) “You’re the one in the trenches hearing the stories. We’ll keep evolving this to make it more relevant. What do you think about adding the smell of burning hair?”

Rizzo was sitting in a tiny, windowless room in front of a table ringed by a cloth skirt that partly hid the electrodes and other equipment that monitor a person’s blood pressure, respiration, heart rate, and stress level during treatment, and were connected to two computers. He had flown in the night before to install the latest software upgrade, which he was introducing to the therapist, a slight young woman in her thirties.

“O.K.,” Rizzo said as he clicked the computer mouse rapidly, “this is really cool.” On the screen was the basic Virtual Iraq market scene: a few nearly empty vender stalls in the middle of a plaza and a row of small, ground-floor shops in dun-colored buildings lining the sidewalk. “You walk to the end of this street”—the sound of footsteps could be heard—“it’s market east. Now, let’s see if this works. Let me blow up this car.” He clicked again and a small car about the size of a Toyota Corolla, which had been parked at the curb, burst into flames. “It’s a good effect. Now, when you blow up the car, put in ‘add stunned civilian.’ One more thing—you have to learn where the R.P.G. guys are.” He was referring to figures toting rocket-propelled grenades. “There’s one here,” he said, and on the screen there was another explosion. “Now we’re going to head over there,” he said, moving forward—more footsteps—toward a set of stairs. “Here’s the deal with going up the stairs. You’ve got to hit it square on, otherwise you’ll get caught up in the collision barrier. It just breaks the presence. You’ll have to guide them. From here, there’s a variety of things you can do. First off, you’ve got the insurgent on the roof over there. The insurgents just pop up. You have to learn where they are, too.”

The therapist looked over Rizzo’s shoulder while he brought a Black Hawk helicopter in for a flyover and then blew up another car on the street. “One thing I have to be careful about is not hitting something by accident,” she said. “One time, I mistakenly clicked my mouse and all of a sudden a bullet came flying out, and I had to tell the patient that I was sorry and didn’t mean to do that.”

The first time I put on a head-mounted display and headphones and entered Virtual Iraq had been in this same room, at Walter Reed, a few months earlier, after Rizzo presented preliminary results from a study site to a small gathering of military officials. Rizzo was having trouble linking his laptop’s PowerPoint presentation to the Walter Reed audiovisual system, and he had to speak without notes, often from a crouch behind the podium as he picked through a jumble of cables searching for one that was live. “The last one hundred years, we’ve studied psychology in the real world,” Rizzo told the group. “In the next hundred, we’re going to study it in the virtual

world.” He threw out some numbers. Of the five subjects who had completed treatment, four no longer met the diagnostic criteria for P.T.S.D. A fifth soldier showed no gain. (To these he would add, a few months later, the results for ten others, eight of whom had got better. Of the six research sites, San Diego was the first to have preliminary results.) After talking more generally about the features of Virtual Iraq, Rizzo invited everyone present to the fourth-floor psychiatric wing to try it out.

Although I had seen Virtual Iraq in one dimension on a computer monitor, encountering it in three dimensions, with my eyes blinkered by the headset and my ears getting a direct audio feed, was different. It still felt like make-believe, but I was fully engaged. Rizzo placed a dummy M4 rifle in my hands, and guided my fingers to a video controller fixed to the barrel. (By design, patients who use Virtual Iraq do not fire weapons; the M4 is a mood-setting device, for verisimilitude.) One toggle moved me forward, another moved me back, and a third sped me up or slowed me down. Because the display tracked with the orientation of my head, whichever way I moved determined not only what I saw but where I went. I pressed the forward button and strolled down the market street and, at Rizzo’s instruction, turned at a doorway and entered a house. Inside were two insurgents, one on his knees, with his hands tied behind his back, the other dead on the ground. A baby was crying. I moved on.

The next time I put on the headset was in Marina del Rey, California, at an Institute for Creative Technologies lab space called FlatWorld, most of which was given over to life-size “mixed reality” worlds that could be negotiated without special equipment. (It was so realistic that when a virtual insurgent popped up across the virtual street from the virtual building in which I was standing, his bullets made successive holes in the virtual wall behind me and seemed to shower plaster dust through the air.) The Virtual Iraq design team, two artists and a programmer, worked out of FlatWorld, and it was their system, with the most recent improvements and additions, that I was using. This time, Rizzo sat me in a chair placed over a bass shaker, which is also known as a tactile transducer, a device that transmits the feel of sound. I slipped on the display and the headphones, and Rizzo pressed some keys on his

computer and made me the driver of a Humvee, with a soldier in desert fatigues sitting next to me and another in the back. (Because the gunner was in the turret, when I looked in the rearview mirror I saw only his boots and his pant legs.) As soon as I started up the vehicle, the floor under me began to vibrate and my ears filled with the hum of tires on pavement. Suddenly, a gunman appeared on the overpass above me and started to shoot. Off to my right, a car burst into flames. Half a second later, the explosion entered my body through my feet and ears. It was startling, the way any unexpected loud noise is, but it wasn't frightening. Even when the guy in the seat next to me was shot, and his shirt sprouted a red bloom, it wasn't frightening. I had never been to Iraq. I had never been to war. The scene did not conjure any memories for me, traumatic or otherwise. It was, as JoAnn Difede said of stairs on September 10th to a person who worked in the World Trade Center, neutral.

I had seen, though, what might happen if it triggered an emotional response, when an actor named Ed Aristone, who had been cast in a movie about the Iraq conflict and wanted to get a sense of what combat was like, put on the head-mounted display at FlatWorld and found himself in the midst of a war. Rizzo cued up car bombs, shouting soldiers, ambient city sounds, blinding smoke, inert bloody bodies, the call to prayer, a child running across the street, the cough of an AK-47, snipers, a nighttime gale—all ten plagues and their cousins at once. Aristone started to sweat. His heart was racing. His hands were numb. He was having a hard time holding the rifle. His face went white. He bit his lips. After ten minutes, he said he'd had enough.

"This shows you why you need a trained therapist," Rizzo said, turning off the machine and watching Aristone, who was bent over, with his hands on his knees, taking deep breaths. "Someone who knows exposure therapy, who knows how little things can set people off. You have to understand the patient. You have to know which stimuli to select. You'd never do what I just did—you'd never flood them. You have to know when to ramp up the challenges. Someone comes in and all they can do is sit in the Humvee, maybe with the sound of wind, and may have to spend a session or two just in that position. For P.T.S.D.,

it's really intuitive. We provide a lot of options and put them into the hands of the clinician."

One of these is Karen Perlman, a civilian psychologist who uses Virtual Iraq with patients at the Naval Medical Center San Diego. Perlman is an apple-cheeked, middle-aged native Californian with cascading brown hair, who, when I met her, was wearing an elegant short black dress with a pink-blue-and-purple tie-dyed silk scarf. At first glance, Perlman does not seem to be the sort of person a young marine would cotton to, but Rizzo says that she has a gift, and so far eight of the nine patients she has treated no longer meet the criteria for P.T.S.D. (This number does not account for those who dropped out.) "It's a very collaborative relationship," she told me in February, when Skip Rizzo and I drove down to San Diego. "I know which stimuli I'm going to add as the therapy progresses. I'm not going to overwhelm them. There are no surprises. I say, 'I think you're ready for the I.E.D. blast or for more airplanes.' I'm not only adding more, but increasing the duration of each one. It's intensive, but for P.T.S.D. you need a treatment that is intensive."

Although Perlman had been a clinician for more than twenty years, before she began work with marines at the Naval Medical Center she had never used prolonged-exposure therapy with patients, and she was surprised by its therapeutic power. (She had spent four days in Philadelphia being trained by Edna Foa, the director of the Center for the Treatment and Study of Anxiety at the University of Pennsylvania, who initially developed the prolonged-exposure technique while treating rape victims, and a day with JoAnn Difede, learning how to integrate virtual reality with exposure therapy.) "I've seen patients recover in five to six weeks," she said. "To see someone respond in such a dramatic way is very gratifying. What we're doing is very structured and systematic. It treats the core fear, the avoidance and the anxiety that are part of P.T.S.D., in a potent way. V.R. augments the therapeutic process. When the patients start to see results, usually by the fifth session, they turn the corner and get motivated."

Outside his therapist's office, Travis Boyd had "homework." He had been told to listen to an audiotape of the previous session, and to do the very things he had been avoiding—going to the mall, driving a car, calling his family back home

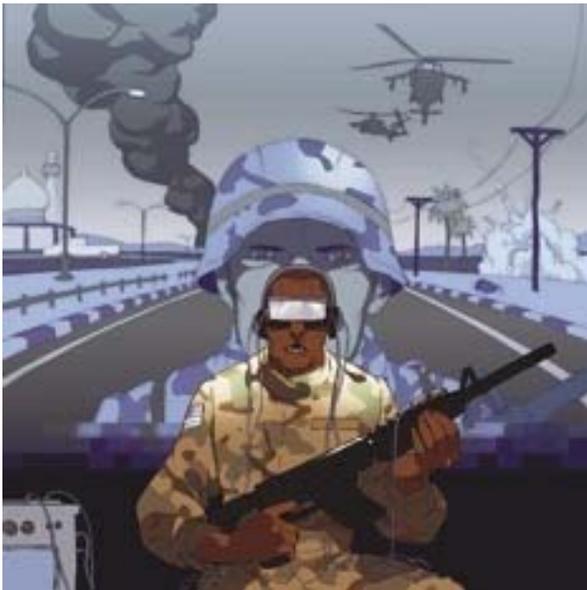
and telling them what was really going on with him and answering their questions. He also called every one of the men who had been on the roof that day and asked them to tell him their recollections. He was surprised to learn that not one of them thought, as he had for so long, that he was responsible for their team leader's death. In fact, as they remembered it, the man had told Boyd to wait at the top of the stairs. "I had been walking around with all this guilt about getting my brother killed," Boyd said. "It just weighs on you. He was not the only friend I lost, but I was closest to him. Everyone thought it was awful that he died, but nobody thought it was my fault."

The first thing Boyd noticed, after a few weeks of Virtual Iraq exposure therapy, was that he was able to sleep without medication. He was more relaxed, and he could joke around. "Before, I felt like there were two people in me," Boyd said. "The marine, who was numb, who was a tough

guy, and the civilian me, the real me, the guy who isn't serious all the time, the guy who can take a joke. By the end of therapy I felt more like one person. Toward the end, it was pretty easy to talk about what had happened over there. We went over all the hot spots in succession. I could talk about it without breaking down. I wasn't holding anything back. I felt like the weight of the world had been lifted. I was ready to be done. The last two sessions, I didn't think I needed to be there anymore."

The last time I talked to Travis Boyd, it was his third wedding anniversary. Boyd is now twenty-two, and works for a commercial construction firm in the Midwestern town where he grew up. "Most of the intrusive thoughts have gone away," he said. "You never really get rid of P.T.S.D., but you learn to live with it. I had pictures of my team leader that I couldn't look at for three years. They're up on my wall now." ♦

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