

"[Virtual reality] imagery is very cartoonish," says Larry Hodges. In the background is the virtual elevator used to help people afraid of heights. "You would never confuse it with the real world....We just have to have the right details," he explains.

Virtual Therapy

Therapy combined with computer-generated virtual worlds help people face their phobias.

The video shows a man standing in a darkened room, his posture tense. A strange-looking contraption covers the upper half of his face, filling his senses with a virtual version of Vietnam. Through earphones, he hears whirring Huey helicopter blades, staccato bursts of gunfire, and shouts from soldiers under fire. A tracking function on the head-mounted display correctly repositions the scene in response to his every head movement.

"All right, all right, you've got to back it up, back it up, get out," the man yells into the quiet room, commanding comrades in the virtual environment. "Work that area, keep working the area. Put the machine guns all over. Here it comes. Hold on, hold on. Look at your men, look at your men. Drop and keep your head down!"

An off-camera therapist in the room waits for silence, then asks the man, "How are you doing? Are you ready for the takeoff?"

"Yeah, that's fine," the man responds. He takes a step back, unthinkingly clearing his real-life body from the vortex of the imaginary ascension of the chopper.

Again, the therapist quietly intervenes: "The sound of the takeoff—what's that like for you?"

"I felt good for the guy getting out of here," the veteran replies. Then, his mouth tightens, and he returns his attention to the virtual environment, once again fighting enemies that have ravaged his memories and sleep for 25 years.




Keyboard controls in the "virtual Vietnam" allow the therapist to add gunfire, explosions, or fog, as well as change the scene from night to day. "As the [traumatized veteran] tells his story," Larry explains, "the therapist makes the virtual environment follow along."

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We don't just create environments because we can and we think it's cool. We want it to work and be helpful.

Barbara Rothbaum



"It's really gratifying when I'm doing good research that seems to be helping people," says Barbara Rothbaum, who'd never even played a virtual reality game prior to the research project. She's since played "one of those shoot 'em up games. I thought ours was much more interesting."

The video of a veteran with Post Traumatic Stress Disorder (PTSD) was created at Atlanta's Veterans Administration Hospital. But the study, and others aimed at people with less complex phobias, originated and continue through research by Georgia Institute of Technology's Dr. Larry Hodges and Emory University's Dr. Barbara Rothbaum.

Virtual Exposure

In 1993, Larry, an associate professor and head of the virtual reality program at Georgia Tech's College of Computing, and Barbara, an associate professor and clinical psychologist at Emory, began exposing people with a fear of heights to virtual environments that simulated a glass elevator and bridges that rivaled those in an Indiana Jones movie.

"Exposure therapy is a way to help someone confront what they're scared of in a therapeutic manner," explains Barbara. Part of the therapy includes

learning anxiety management techniques, such as breathing exercises. Healing begins when the patient submits to gradual exposure of the feared situation over and over again until the fear is mastered.

"The problem with [traditional exposure therapy] is that you've got to actually go out to a real environment to do it," says Larry.

Treatment for someone afraid of flying, for instance, requires several trips to the airport to prepare them for an actual flight with a therapist. It's expensive, time-consuming, and can compromise patient confidentiality. It also limits exposure to one takeoff and landing. With a virtual plane, however, the therapist and patient control timing and they can practice.

When Larry first contacted Barbara about the idea, he thought she'd dismiss him as a nut. Barbara, who at that point had never even played a virtual reality game, admits her first response was along the lines of "You want to do

Everybody says they're afraid of heights. The real "phobia people" are not afraid of the Empire State building—they're nervous standing on a table.

Larry Hodges

WHAT?" But, after a review of Larry's impressive resume, she agreed with him that the premise had promise.

So Larry and his team, working with Barbara and her colleagues, designed a virtual 49-floor glass elevator, hoping it would evoke gasps from people fearful of heights. "We didn't know if you were afraid of heights in the real world if you would become scared in virtual reality," says Larry. "And, if you were frightened in virtual reality, we didn't know if that would carry over into the real world."

Virtual environments scare the phobia out of patients—which is the point of exposure therapy. Details such as a real-life rail help enhance the illusion.



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"The question was," Barbara says, "would people suspend their disbelief enough to really get scared [in a virtual environment]—and get better?"

Turns out, research subjects do get scared—and they do get better. Larry and Barbara's 1995 research study paper in the *American Journal of Psychology* was the first published controlled study using VR to treat a psychological disorder. A fear of flying virtual study quickly followed, as did a virtual environment for those afraid of thunderstorms.

With these successes, the researchers wanted to "push the envelope," and began working with the VA Hospital and PTSD veterans. "Getting these guys to talk at all is tough," says Larry. He recalls one veteran who, left for dead, became the lone survivor of an attack on his helicopter. "Some of the worst ones, it's a buried thought. They never talk about it; they never even consciously think about it, but they have nightmares and flashbacks." The "virtual Vietnam" research is ongoing, but many research participants are reporting fewer night sweats and nightmares. The results have been positive enough to expand the research to a larger study in Boston.

Measuring Success

For those with less complicated phobias, success is easier to measure. "Everybody says they're afraid of heights," says Larry. "The real 'phobia people' are not afraid of the Empire State building—they're nervous standing on a table." One of the research participants, for example, was unable to park above the first level of a parking deck. After eight weeks in the study, "she came in very excited [because]

that day, she had actually parked on the fifth level of the parking deck near the edge," Larry says.

Another man, prior to therapy, chose to walk up 70 flights of stairs to join friends at a restaurant rather than ride an outside glass elevator. "At the end of therapy, without us even asking him to, he invited the same friends back to the restaurant and was able to ride the elevator with them," Barbara says.

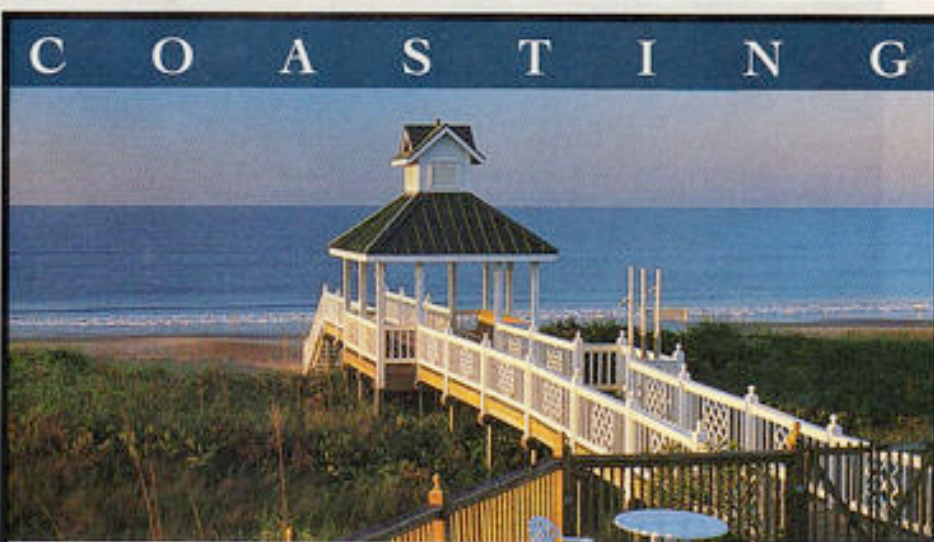
Still another, afraid of flying, was about to enter a business venture that involved overseas travel. A month after therapy, she flew to Europe.

What's next for the researchers?

"Virtual Toastmasters," for people afraid of public speaking; a virtual car and road environment for those fearful of driving; and a virtual mall for people frightened of social interaction.

"We try to think about where we can make treatment easier, cheaper, or more available. We don't just create environments because we can and we think it's cool," Barbara says. "We want it to work and be helpful."

Clearly, the researchers have come a long way since their initial foray. Back then, Larry jokes, "We weren't sure if we were on the cutting edge or the lunatic fringe." *Nancy Dorman-Hickson*



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