

Getting Real By Jeremy Bailenson End Well Symposium, December 6, 2018

Start of Transcript

[Crowd Applauding]

My name is Jeremy Bailenson and since 1999, I've been building immersive virtual reality, putting people inside VR, and testing to see what happens to the brain. Testing to see how people use VR and testing see which applications work. So I'm very appreciative to be here today and to get to talk to you about this technology and how we can think about it in terms of end-of-life.

I have three goals for today. Number one: all of us walk out of here understanding how virtual reality works from a technological standpoint. Number two: we go over some examples of how I've used VR in the last two decades to solve some pretty hard psychological problems. Number three: we all brainstorm on when we apply this amazing technology to designing the end-of-life, that there's a lot of real action there. And I'm really hoping that there's some conversations out for a lot of us.

So can we start by raising your hand if you've ever been in virtual reality **[00:01:00]** before? About half of you. Raise your hand if you've been in VR and gotten to walk around. Okay about 10% of you. Fantastic.

So I'm gonna flash you back to year 2001. So my PhD was in Cognitive Psychology. In 1999, I left that field learn how to build VR, to test its effects on people. In the year 2001 we flew to Washington D.C. and we were at a conference at a Federal Judicial Centre where we were trying to figure out how one would apply virtual reality to the courtroom.

For example, recreating crime scenes or having witnesses look at suspects to do police lineups. And we were there in 2001 we flew over super heavy equipment across the country. This was from Santa Barbara where I was doing my post doc and we give this demo onsite in DP and we had a judge put on the goggles — this is a federal judge — and we gave him our best demo. So of those of you come to my **[00:02:00]** lab, the best demo that shows how amazing VR is, is what we call *The Pit* and in that demo you put on the goggles and you look around and you see a 3D model of the room that looks just like you're here and you walk around and say, "Oh, that's neat." We then hit a button and we drop a chasm. That chasm is about ten meters deep and it's about three meters to get across and we put a little rickety plank that you see in the image above to get across. Okay?

The point of this demo is it feels so real to be on there. It's an amazing experience. This judge that we brought in there, there's a room about this size, about 500 people high-end lawyers and judges were watching and this gentleman who was crossing the plank and he just stepped a little bit to the left... off of that board. We're tracking gravity so when he steps off from what his eyes are telling his brain, and what his ears are hearing with spatialized sound, he feels like he's plummeting to the bottom of that pad/cad. Now if you're in the real world **[00:03:00]**, and you fell off that plank, how would you save your life? You would dive at a 45 degree angle to try to catch the lip of that edge that's starting to move away from you. And so this federal judge, in the middle of a room of just like this, just decided to dive at a 45-degree angle into the air. It gets worse. As my first public demo since I've given thousands for a year, the computer was sitting on a table with a really sharp corner, okay?

[Crowd Gasping]

So I was this 26-year-old post doc I basically had one move and that was to smash into him to redirect his trajectory so his face didn't hit the corner. So he was fine. He was a good sport about it. I didn't get sued, we didn't go to jail. But the reason I waste two of your valuable minutes on this story is that this is called by psychologists, "Presence." Presence is defined as the illusion of non-mediation. When VRs done well, there's no pixels, there's no field of view, there's no gadgets, it's just an **[00:04:00]** experience that you have. And everything I'm gonna talk about for the rest of this lecture takes as an assumption that VR is so real, that the front of your brain, you can say this is not real, this is not real! But the back of your brain, that part that's in charge of keeping you alive, cannot overcome the illusion.

Here's my lab at Stanford, it's an amazing technological lab. You got a great tracking system to measure your movements. We've got a floor that shakes, we've got 24 speakers that can move sound around the room, we do a virtual scent, we got visitors from heads of states. We get visits from the US military or from CEOs who are evaluating should I use VR for my company. But now that I've bragged about my lab, let me convince you that it is becoming completely obsolete from a technological standpoint. So of all the papers that I've published over the last two decades, about three quarters of them are done using the goggles that you see on the right. Each one of them cost more than my car. Okay? I drive a Ford C Max so maybe that doesn't say all that much **[00:05:00]**

[Crowd Laughing]

But \$40,000 was the typical price tag for head-mounted displays, historically. Now we got Facebook and Samsung and Google and HTC and so in a year in the game, goggles are \$100, \$200... and we've gone from the point where instead of there being at its peak, you know five to seven years ago, 1,000 headsets, 2000 headsets in the world, there's now tens of millions of them.

So this was Popper. Popper turned 93 two days ago. In this picture he was 90 and like those of you who raised their hand, when I put Popper in VR, he looked around and he said, "You know, this is kind of cool. But really what's the point?" You know, what am I supposed to do in here? What's the point?

And what we're gonna talk about for the rest of today is what is a good use case of VR? Good use cases of VR, in my opinion, are things that leverage it, a paradox. The paradox is this. The brain treats VR as real. Remember the judge dove at a **[00:06:00]** 45-degree angle, but you can do anything! If a programmer can imagine in a simulation, you can go back in time, you can grow a third arm, you can be a different age, a different gender, you can break physics. You can create these fantastical experiences but the brain treats them as if they were real. And this is where VR really earned its key.

Now VR is not for everything. Okay? {Showing a Photo of Him In the Middle of a Busy Street Using VR}

[Crowd Laughing]

I'm a VR guy who do nothing but study VR for the last few decades and I don't use it at home. I don't play video games. I don't have a Facebook account. Five years now from now, if you guys are checking your email on VR, then I have failed miserably as an evangelist. It's not for that. It's for very special experiences.

I'm gonna give you an example. The first industry grant I got at Stanford was from a company called Cisco and a woman named Marsha Stowski came to the lab and she put on the goggles. She tried out the demo I'm about to show you. It's a virtual mirror. And the virtual mirror leverages two types [00:07:00] of psychological theories. The first one is called the *Contact Hypothesis*. In the 1960s when schools were segregated, psychologists and sociologists came up with a theory that said if we get people who were different, you just put them together, they're gonna learn to get along. That's the simplification of a theory but the general idea is that physical contact with people who are different eventually will cause you to get along with the outcome. The second theory leverages something called *Body Transfer*. Body transfer is a neuro-scientific principle that if I move physically, and I see an avatar, a digital representation of myself, move with me, that after about four minutes of me moving my arm and seeing that avatar move with me, the brain treats that avatar as if they're part of me. In other words, from a neuroscience standpoint, when I think of myself, a part of my brain lights up. When I see my avatar, the same part lights up. In other words, that avatar becomes us.

Now I'm gonna show you a movie. Please don't laugh at it. It's fifteen years old, and this is the first VR demo [00:08:00] that we've ever built to cause people to join those two theories which is instead of being around with somebody who's different, what about you become them?

So this is Nikki, the genius that did a lot of this early work starting 2003. And he's moving around the physical room. He walks up to a mirror and the experiment he does is about two or three minutes. You're only gonna see this for about ten seconds. He moves his head to the left, the avatar moves with him. He continues to do a series of physical movements and sees the synchronized movements of the avatar. He bends down... we hit a button. He comes up and now he's a woman of colour, okay? And the reaction that you get when your body changes and you become someone else is very intense. Our experiments from the last 15 years have shown when you become someone else, it could be a different age, a different race, a different gender, a different specie, that compared to watching a video [00:09:00] doing role playing, becoming someone else and fear experiencing trauma firsthand, causes you to behave differently. Causes you to change your attitude to behaviour in a way that's stronger compared to other treatments people tried in the past.

To give an example, Fernanda Herrera, a 4th year PAC student in my lab, worked on this project for the last three years and it just got published a week ago. In this study she had people become homeless. They found out that situational factors can cause you to lose your own youth, lose your job, you try to sell stuff in your apartment, you can't make enough money and you get evicted. You try sleeping in your car, it's an intense body experience for you to actually become homeless and you feel what it's like to get harassed on the street. What Fernanda studies is compared to lots of control conditions, after this, are you willing to sign a petition that says "I'm willing to have my own personal taxes increased in order to support affordable housing measures but she hasn't actually physically signed [00:10:00] a real petition. What she's discovered is even two months out, compared to a controlled condition, becoming homeless causes more behaviour change compared to role playing. And this is the type of studies that we did.

We also studied empathy not to others but to ourselves. So how Hershfield who's now professor in a business school of Stanford, his dissertation was about connecting to your future self. And he took 20-somethings, brought them to the lab and we scanned their bodies, they walked up to that virtual mirror, did body transfer with their age-appropriate self, they're in their 20s, we then hit a button and use computer graphics to age them so much that they got to meet themselves when they're going to be 70. In other words they get to become their future self and experienced that. And what Hal cares about is financial planning for this future. And what he gave these subjects is the option of "Here's twenty bucks now. But if you wait and put

it in a savings account, we're gonna give you fourty." And similar treatments like that. To make a long story short, across dozens [00:11:00] of experiments, Hal demonstrates that becoming older in a virtual mirror causes you to differ gratification and causes financial savings.

Now we are in a huge crisis in this country. 20-somethings are not putting any money in the bank. They're also gonna live til' their ninety. And so there's gonna be a 30 or 40-year period when they're in poverty. So a lot were working now for a lot of the financial institutions to help them use this principle in their systems to help people save money.

And the first to mark is Bank of America. What they did, they figured out how to scan your face from the camera in a laptop and if you open a new Bank of America account you'll be asked, "Do you wanna do face retirement?" If you say yes, it'll scan your face and your future self becomes part of your banking interface such that every financial decision you make, your future self is staring at you.

[Crowd Laughing]

And the more money you put in savings, the happier your future self gets. Okay?

[Crowd Laughing]

And at Stanford we like to call this win-wins. Bank of America [00:12:00] is gonna get more money in their account, and 20-somethings are not gonna be in poverty decades from now.

We took this principle to *Fidelity* and we're working with *Fidelity* so one of my graduate students whose named Derek Belch, and Derek formed a company called she's using VR *Striver* and he's using VR to help people with lots of issues including those around end-of-life.

Imagine you're at a call center and you're trying to advise somebody over the phone how to invest their life savings. What percentage to take out of their paycheck, we've used VR to train people in call centres and while they are in the call center, they get a button and then they're in the living room of the person they're advising. They see that she's got crutches and can't walk. They see the stack of bills in front of them on the table. Since *Fidelity* started using this, customer service evaluation of people in call centres has gone up ten percent. This experience that becoming someone else and feeling what it's like, helps the people in call centres give better advice to people that are saving for their future.

At Stanford there's a doctor named Anne Dubin, Laurence Schneider, and Lauren Zack [00:13:00] that are building conversational simulator and testing it to have — imagine you're a doctor, you're a pedia, a heart surgeon, and you're sitting across the table from a parent and you have to tell the parent "You're child's gonna die." There's no practice for this. There's no practice — that moment is gonna be exed on the mind of the parents forever. But these interns that are training for this, they thrown into a real situation and they've never gotten to try. What we built is a difficult conversation trainer where these doctors practice delivering this news about end of life. And in our first study, really good results showing that these people are now more prepared to have an actual conversation.

I wanna talk about scale. So Derek's company, *Striver*, just signed a contract to put four virtual reality training systems in every single one of Walmart's 4,700 stores. So there were 200,000 people Walmart placed trained last year in VR and this year, we are going to have [00:14:00] over a million. Practicing these difficult conversations, so that they get better at their job. If we come up with an application about end-of-life, it can scale. Where do you wanna die? Who do you want to be there? What do you wanna say? The reason we have virtual reality is because

of a flight simulator. Why do we have a flight simulator? Practice. We learn by doing, making mistakes, getting feedback, doing it again and improving. And why not do this for end-of-life decisions and there are a number of companies that are building these practice simulations for end-of-life, number of academics. There's a fun study that came out three days ago — sorry, three weeks ago by Mill Slater where he had subjects, he and his colleagues, literally experienced their own death and then figure out how they're gonna change their lives a new way afterward and showed lots of positive affect.

On that note, I'm gonna conclude and I'm gonna thank you for your attention. This is my book experience on demand. VR's not for everything. If there's one thing I would urge you to say **[00:15:00]**, VR is an experience. Experiences can produce change but it really depends what you do with virtual reality so thank you for your attention. I appreciate it.

[Crowd Applauding]

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