

Hopkins Hour Questions and Answers - 23 July 2020

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Questions answered by:

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Question and Answers:

Question one:

What are the plans post-study to commercialise this kind of technology?

Answer:

Yes, there is opportunities to commercialize it. At the moment we are taking the slow road in that we're looking for some indication that we're on the right track before we start making promises to the public. There are barriers to cross in terms of how you distribute it and deal with safety issues and those sorts of things. We definitely see the commercialization as perhaps a necessary evil when it comes to commercializing technology, because you need to provide customer support, you need to update software for new virtual reality headsets, etc. Then there could be a side benefit that we can funnel revenue back into research as well.

Question two:

In one of Dan's early comments about body disembodiment, that is certainly one of the aims of traditional meditation. Will VR achieve a similar state?

Answer:

There are some researchers, for example Mel Slater in Spain. Who has created an out of body illusion, that uses both tactile feedback and a virtual reality environment to lift people up out of their bodies. You can look up Mel Slater, if you want to look at how he's done that. Some interesting reasons as to why you might want to do that. Out of body experiences have been linked to things like lowering your fear of death and having a greater sense of empathy. Experience of feeling like one with the universe, like you're not attached to a physical thing, for some people can have quite profound effects.

Dr Mel Slater: http://melslater.eventlab-ub.org/Mel_Slaters_Event_Lab_Home_Page/Mel_Slaters_Event_Lab_Home_Page.html

Question three:

How much is the cost of VR equipment and software?

Answer:

We are doing quite a lot with a wireless headset called the Oculus Quest. It is amazing and doesn't require a computer to be attached to it and is about \$600 or \$700. That is starting to bring high quality technology into a price range that can reach a pretty big market. If you want them more powerful systems, if you've got a reason for that, you've got a had a \$4000 computer to your budget.

Question four:

Can this be extended to pain from other neurological/spinal conditions/diseases?

Answer:

Yes, a lot of the work has come from the neurological space. I think, the sky's the limit. If you've got a condition in mind. The trick is always, we don't want to be using technology for the sake of technology. So always a good question is, what is a feature of virtual reality that can enable us to do something for this condition that we couldn't normally.

Question five:

When you measure pain during VR, does the measurement of pain result in them coming out of VR?

Answer:

We talk about the concept of immersion, which is the degree to which people really feel like that in the virtual environment. If they have an avatar, then we also talk about the degree to which they really feel like that's their body. That's an illusion that can be disrupted. I think anything you introduced from the outside world, has the potential to diminish that to some degree. We didn't measure it, but I will always be a bit cautious about how much external feedback I gave someone. If what I was aiming for them to do, was to detach from the real world.

Question six:

Have you compared the effects that you see with the VR system, with more 'traditional' gaming systems? Could there be a similar effect?

Answer:

Gaming systems have been used in the hospital sittings for a long time. I remember 20 years ago playing Xbox or Nintendo in hospital, when I was having various procedures. I can't quote the research, that haven't been compared head to head a lot, but I think it has been done. There is some additive effects on virtual reality. I'm not sure the magnitude of the difference, but it comes down to the degree to which one thing is more distracting or the degree to which it captures a greater share of your attention. Virtual reality just has a superior capacity to do that.

Question Seven:

Can you use some of the work done in 3MDR done in the Netherlands Military Pyschotraumatic Centre to treat pain? They use it to treat PTSD following trauma in both the military and refugees from war-torn countries? Would the pathways be similar?

Answer:

I assume the sort of therapies your talking about is exposure therapy, were they would use virtual reality to bring people into scenarios that normally might trigger their symptoms, make it to do things in a very graduated way Just bringing small components of triggers into their virtual environment. Exposure therapy is a well-used treatment for persistent pain as well. I'm sure there's something to be learned from that literature, that could be translated to the chronic pain space, for people who are fearful of movement and activities, and perhaps gradually reintroducing them to activities that they've come to be afraid of and avoid because of the situation.

Question eight:

Are there studies by your group or others that might use VR for anxiety disorders or OCD etc.?

Answer:

PTSD is one of those. In a way, we have already answered that already. Basically, retraining the brain, we can put a lot of these things under that umbrella.

Question nine:

Are there plans to allow patients to choose the VR environments? Does this matter? Are there other ways to personalise the experience?

Answer:

Great question, I 'am talking to a pain clinic about this at the moment. There are over 1000 different applications on the Oculus store now, which is one of the databases for virtual reality games and experiences. There are of course a varying quality and a lot of them are first person shooter games and all of that. If someone has a yearning to play a game of tennis but they just don't have the physical capability, then we can dial up a game of tennis and have them engaging in a game of tennis in a virtual sense. We're only limited by the types of activities in environments that people are interested in and what software is available to us, and that's growing all the time. Thinking back to the case study. I still wonder to what degree, it seemed to be helpful to this case, because he really identified with that boxer, so I think that personalization could be really important.

Question ten:

Could this have applicability for conditions where pain is not persistently located in a single place (i.e. where pain comes and goes from different locations)?

Answer:

Yes potentially, I mean the intervention that I used with that case study, in many ways isn't specifically tailored for lower back. It's not like I had been doing activities that specifically engaged the back. There is potential for that. I think it's a future line of research to try to

identify what sort of patient, with what sort of presenting complaints and contributing factors might benefit from that sort of thing. Pain that is unpredictable, in the way that is scribed could add an element of challenge. That's probably the best I can do to answer that question right now.

