

Treating depression with a different tablet

Mental health disorders, such as depression and anxiety, affect a large proportion of the elderly population worldwide. **Professor Patricia Areán** and her research team at the University of Washington are looking for innovative therapies to rival the current gold-standard treatments, supporting elderly patients through their mental health conditions. This includes the use of a therapeutic video game called *Project: EVO* and a renewed, observational approach to existing psychotherapy treatments.

In an age where technology is advancing at an exponential rate, the emergence of video games as therapeutic treatments to treat mental health disorders in the older generation has become a more and more likely, and attractive, prospect. Not only that, but through observational cognitive neuroscience, current gold-standard treatments for depression and anxiety are being innovatively renewed to improve the outcomes for elderly mental health patients.

Depression is a mental health disorder which currently affects approximately 350 million people of all ages worldwide. The condition leaves sufferers in a state of low mood, with an aversion to activity and a lack of emotion in certain situations. Current treatments include antidepressants and psychological therapies, both with the fundamental aim of stimulating the activation and uptake of dopamine and serotonin – two vital neurotransmitters that influence mood.

THE NEXT STEP OF EVO-LUTION FOR DEPRESSION

It is within the bracket of psychological therapies where Professor Patricia Areán's work comes in. With her team at the University of Washington, she has been investigating methods to streamline behavioural interventions that can alleviate the symptoms of depression in later life. To do this, she has utilised recent advances in technology. Here we highlight one completed study, as well as three that are under way.

The first of these studies used a game called *Project: EVO*, as designed by Professor Areán's colleagues at the University of California, San Francisco and a technology company called Akili. This was built as a mobile application for tablets and other mobile devices, and Professor Areán's study looked to assess the effect it had on a small sample of elderly adults who were not responding to antidepressants.

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Dr Areán as a guest on Bennett Solomon's Right at Home Senior Care Living Show



Within the game itself, the patient controls an alien character with two main tasks to perform: navigating the spaceship, while also collecting certain specimens and avoiding others. While it may sound simple in design, the science behind it is anything but, with the main idea focused on getting the patient to multitask.

ALIEN MULTITASKING

Multitasking stimulates two key areas of the brain. The first of these areas, called the prefrontal cortex, is responsible for planning complex cognitive behaviour, making decisions and moderating behaviour in social environments. The second area, called the anterior cingulate cortex, plays an important role in key executive functions such as impulse control, emotion and designing plans. Typically, when multitasking, both areas work together, with the prefrontal cortex making the decision and the anterior cingulate cortex designing the plan. However, when these areas do not work collaboratively, as is often the case within depression, this can lead to difficulties in concentrating and making decisions, as well as a lack of motivation. As a result, this leaves the individual feeling depressed.

The game has been designed to prevent this though, by simply exercising the connection between these two areas of the brain. In doing so, this strengthens each area, increases the brain's efficiency, and allows the individual to differentiate between important information and noise.

The results from this study were astounding, and using the video game as a therapeutic treatment for depression was found to be as effective a treatment as problem solving therapy (PST), the current evidence-based therapy used worldwide.

Professor Areán and her team now hope to build on this success in a second follow-on study, called the Ilios study. This will assess the impact of *Project: EVO* and

other therapeutic video games on other regions of the brain, to determine whether the success of the Ilios study was specific to the prefrontal cortex and anterior cingulate cortex, or whether the process of exercising the brain was beneficial by itself. In particular, the Ilios study will focus on establishing the affect of video games on the mood, memory and concentration of depressed individuals in later life, aged 60 years upwards. A third study, Estia, is investigating whether similar results might extend to individuals as young as 45.

ENGAGE VS. PST

Professor Areán's fourth study, called the Engage study, is slightly different to the other studies. Rather than assessing the effect of therapeutic video games on

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Q&A

What are the benefits and downsides to running these three main studies at the same time as each other?

The main benefit is that people who are interested in research for depression can have a choice of project to participate in. If they don't like video games, they can be in Engage. If they don't particularly like talk therapy, they can be in Estia. The main downside is that we sometimes struggle to have enough people to participate.

What impact do you expect to see from the Engage study? Do you think it will replace problem-solving therapy as the gold standard treatment?

If it works as well as PST, then yes, probably. So far it seems easier for people to learn and use, and patients are reporting that they enjoy the process. I do want to point out that there never really is a one-size-fits-all approach for treating mental health problems. Some people may do better with PST in the long run.

What is your inspiration behind researching depression in older adults?

My very first experience in providing

therapy was with older adults with depression. I wasn't sure what to expect, or if anything I could offer them would be helpful. But what really struck me was how quickly older people improve when they receive high quality psychotherapy. And the change is incredible. The patients I have worked with literally appear ten years younger, they feel healthier, and are so much happier. It's just a joy to me when I can see people benefit from care.

Although your work focuses on sufferers of depression, will your therapeutically designed video games become available for non-depressed individuals to also use in strengthening their brain?

Maybe. We would have to do the study!

What are the next steps for your research following on from these three studies?

I would like to encourage other researchers to look into novel ways of treating depression. I hope to continue finding new, accessible ways to treat depression.

depression, Engage focuses on using cognitive neuroscience to create an adaptable, personalised psychotherapy for depressed individuals in later life. Through this study, Professor Areán hopes to determine personalised therapies that can be tailored to the social challenges faced by sufferers of depression. The Engage study will compare its success against problem-solving therapy (PST) – an already effective treatment used to treat depressed individuals in later life – to determine its effectiveness, ease of use, and deliverability related to PST. For each patient involved, the programme will begin with a personally designed action plan that re-introduces depressed individuals to simple social activities, before adding in known, effective behavioural strategies if no improvement is seen within two weeks. This will be affected by community clinicians and therapists who will use the concept of 'reward exposure' during the initial sessions with each patient.

During these sessions, therapists will aim to pinpoint certain neurological behavioural barriers in each patient's brain, identifying three key behavioural traits commonly associated with depression. These include negativity bias (patients suffer more of a lasting negative effect from negative situations), apathy (lack of interest or emotion) and emotional dysregulation (uncommon response to emotional circumstances). Once these have been identified, effective behavioural approaches can be personalised to each patient depending on their depressive symptoms.

TABLET TREATMENT

Professor Areán's research offers a lot of excitement and promise that effective therapies to treat depression could be found. Rather than administering pills in the traditional way, Professor Areán utilises a different form of tablet to treat depression, which enables depressed individuals in later life to take back control of their disorder.

Detail

RESEARCH OBJECTIVES

Professor Areán's work focuses on the recognition and treatment of mental disorders in older adults and minority populations, particularly in the recognition and treatment of depression that is identified in non-mental health settings. She is currently involved in three main studies related to this – Ilios, Estia and Engage. Two of these focus on utilising therapeutic video games to treat depression, whereas the third focuses on creating therapies tailored to the social challenges of depression.

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COLLABORATORS

The University of California, San Francisco; Cornell University; Akili Interactive

BIO

Patricia Areán, PhD is a professor in the University of Washington's Department of Psychiatry and Behavioral Sciences, and director of The CREATIV Lab at the University of Washington. Dr Areán's work utilises novel approaches in the assessment and treatment of depression and anxiety, as well as innovative methods for recruiting and retaining people into longitudinal research.

CONTACT

Professor Patricia Areán
CREATIV Lab
Department of Psychiatry and Behavioral Sciences
University of Washington
Box 356560
1959 NE Pacific St
Seattle, WA 98195
USA

E: parean@uw.edu

T: +1 206 221 8568

W: <https://www.rightathome.net/seattle-eastside/blog/radio-show-121116>

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