

# Photorealistic avatars to enhance the efficacy of Self-attachment psychotherapy

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**Abstract**—We have designed, developed, and tested an Immersive virtual reality (VR) platform to practice the protocols of Self-attachment psychotherapy. We made use of customized photorealistic avatars for the implementation of both the high-end version (based on Facebook's Oculus) and the low-end version (based on Google's cardboard) of our platform. Under the Self-attachment therapeutic framework, the causes of mental disorders such as chronic anxiety and depression are traced back to the individual's insecure attachment with their primary caregiver during childhood and their subsequent problems in affect regulation. The conventional approach (without VR) to Self-attachment requires that the individual uses their childhood photographs to recall their childhood memories and then imagine that the child that they were is present with them. They thus establish a compassionate relationship with their childhood self and then, using love songs and dancing, create an affectional bond with them. Their adult self subsequently role plays a good parent and interacts with their imagined childhood self to perform various developmental and re-parenting activities. The goal is to enhance their capacities for self-regulation of emotion, which can lead them into earning secure attachment.

It is hypothesized that our immersive virtual reality platform – which enables the users to interact with their customized 3D photorealistic childhood avatar - offers either a better alternative or at least a complementary visual tool to the conventional imaginal approach to Self-attachment. The platform was developed in Unity 3D, a cross-platform game engine, and takes advantage of the itSeez3D Avatar SDK for generating a customized photorealistic 3D avatar head from a 2D childhood image of the user. The platform also offers facial and body animations for some of the basic emotional states such as Happy, Sad, Scared and Joyful and it allows modifications to the avatar body (height/ width) and clothing color. A study to compare the use of the avatar-based approach (VR) to Self-attachment with the conventional photo-based approach showed promising results. Almost 85% of the participants reported that their photorealistic childhood avatar in VR was more relatable than their childhood photos. Both low-end and high-end VR based approaches were unanimously reported to be more effective than the conventional imaginal approach. Participants reported that the high-end version of the VR platform was more realistic and immersive than the low-end mobile VR version.

**Keywords**—Photorealistic Avatars, Humanoid, Virtual Reality, Mental Health, Mental disorders, MobileVR, Oculus, Cardboard

## I. INTRODUCTION

Currently there is a global mental health crisis of an unprecedented scale, and conventional, non-digital, methods are unable to respond to it effectively. Existing psychotherapeutic approaches are beginning to harness the power of VR to enhance their efficacy in treating mental disorders and phobias. Similarly, Self-attachment therapy – a set of protocols which simulates a compassionate relationship between a child and a primary caregiver - leverages VR to increase its overall efficacy by enabling the user to role play as an adult and interact with their customised photorealistic childhood avatar in the VR as shown in Figure 1.

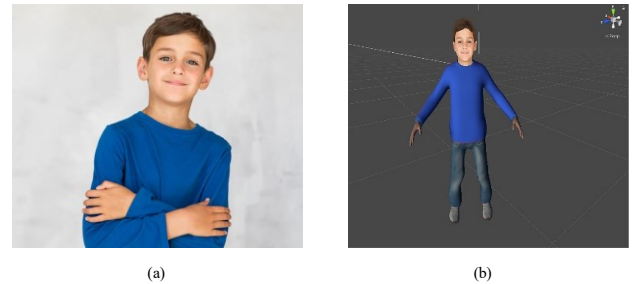


Fig. 1. 2D image of a child [1] (a) customized photorealistic 3D avatar generated by our platform (b).

Conventional treatments for depression involve medication and/or collaborative face-to-face psychotherapy. Cognitive behavioural therapy (CBT) is one of the most widely practised forms. It involves changing patterns of thought to alter behaviour. It is proven to be effective [2]. The traditional approach to CBT is collaborative, highly structured and needs to be administered by a trained clinician which makes it less cost-effective, limits its accessibility and thus makes it less scalable [3]. In the US there are only 14.7 licensed psychologists per 100,000 people [4], therefore the majority of the patients have to wait for weeks if not months before they can access health care; this supply problem is further exacerbated in other parts of the world. According to the world health organisation, for 50% of the global population there is only one trained mental health clinician per 200,000 people [5].

There is an urgent need to bridge this mental health accessibility gap via easily disseminable and highly scalable

psychotherapeutic tools and techniques. Availability of low-cost consumer grade VR systems has accelerated the development and testing of novel VR-based psychotherapeutic interventions. VR is also beginning to be explored as a way to enhance the efficacy of various psychotherapies [6]. Using VR, we can create and deliver highly realistic and immersive environments customised for specific psychotherapeutic intervention; furthermore, clinicians can control stimulus conditions which are costly and difficult - if not impossible- to achieve in the physical world. Customisation can make the VR experience more personalised and realistic and can therefore enhance the efficiency of various VR- exposure therapies. Clinical Virtual Reality applications are already being investigated for treatment of phobias [7], paranoid delusions [8], posttraumatic stress disorders (PTSD) [9], chronic pain [10], and cognitive rehabilitation [11]. VR enables treatment specific customisations of the virtual environments (VE); many VR platform employ customisable avatars to increase their level of immersion and realism. An interesting study by Franco et al [12] investigates that look alike avatars of the participants have a stronger self-representation impact than generic avatars.

Falconer et al [13] used immersive VR to enable patients with symptoms of depression to practice self-compassion in a simulated environment. First the participant was embodied in a virtual representation of themselves (avatar) in order to deliver compassion towards a (generic) distressed virtual child (avatar). Then, the participant was embodied in the virtual child and experiences receiving compassion from their virtual self. Each scenario was 8 mins and there were 3 repetitions of the scenario; 9 participants (N=15) reported decrease in self-criticism and depressive symptoms and increase in self-compassion and furthermore 4 reported clinically significant improvements.

In the Falconer et al [13] approach the avatar did not have resemblance with the user. In contrast, in Self-attachment therapy (SAT)[14], compassion is directed to the user's self-resembling customised childhood avatar (in the VR), which both resembles the childhood-self of the user and is also more responsive to the social support it receives (it transitions between Sad, Neutral Happy and Joyful emotions). We hypothesize that interaction with a customised photorealistic childhood avatar will increase the efficacy because of empathically motivated caregiving behaviour [15]. We explain in detail the tools, technology, and techniques we employed to create customised avatars in Section 4.

## II. BACKGROUND

Virtual reality is a computer-generated graphical simulation with which a user can interact. It can make use of various modalities such as sound, vibration, movement tracking and smell to achieve greater levels of immersion. VR has enabled the creation of highly realistic virtual environments, customised for specific psychotherapeutic intervention, to deliver and control stimuli as and when required by the psychotherapeutic protocols to maximize treatment gains [16]. Patients can experience simulations of difficult situations and be trained (gradually) to handle those stressful situations appropriately. It is now being used in a range of clinical applications such as treating anxiety disorders, phobias, PTSD and for acute pain

management. Advanced psychotherapeutic treatments are now harnessing the state of the art consumer-grade VR technologies to enhance the their efficacy [16]. We explain how various psychotherapeutic treatments have benefited from VR and how our proposed platform for SAT compares existing VR platforms.

Osimo et al. [17] used virtual embodiment as a method for improving patient mood. They conducted two experiments, for first experiment the individuals were first embodied in a virtual body that closely resembled themselves, from which they described a personal problem to another virtual counsellor body representing (Dr Sigmund Freud or Self). Then the individual was embodied in the counsellor body where they hear to the problem and then offer counselling to their virtual self. They again switch to their look-alike avatar body to hear to the counselling offered by the counsellor avatar. The session could be repeated as many times as the participant wanted. Another 10 participants were recruited to see the difference in gains when testing under two conditions i.e. (synchronous or asynchronous (with fixed animations) avatar movements). The study presents interesting findings such as visuomotor synchrony greatly influences the level of ownership and agency experienced by the participants.

The proposed virtual embodiment technique result in sufficient detachment from conventional and habitual ways of thinking about problems, and can ultimately be used to create and retain positive cognitive changes. Another study, by Slater et al [18] further investigates how alternating between different bodies, as described above, could enhance self-counselling experience. The study employed two groups; the first group was required to undergo body-swapping self-conversation experience and the second group was required to talk about their problem without swapping their body with Dr. Sigmund Freud. Furthermore, the response from counsellor body was scripted for the second group. It was observed that body-swapping method (self-conversation) was more effective and resulted in greater perception of change than simply talking about the problem (scripted).

Shah et al [19] investigated the effectiveness of a VR-based a stress management program to treat patients with symptoms of major depressive disorders. The stress management program had a psychoeducation component to teach different stress management techniques, positive thinking and relaxation techniques and a VR relaxation component which involved abdominal breathing control, muscle relaxation exercises and relaxing imagery such as a view of a beach. The study was conducted by professional trained clinicians. All the participants reported significantly lower symptoms of depression and anxiety after the program. The study was conducted in a hospital setting and was carried out by a number of facilitators and investigators. It required face-to-face in-person expert time which limited its accessibility and scalability.

Hussain et al [20] proposed a technique to promote positive emotions and inculcate help-seeking behaviour in patients experiencing depression. The protocol involved patients in watching 360 videos (in VR) of others who experienced depression, followed by an opportunity to say-out-loud their own experience with depression. The protocol was repeated 5

times, and participants were required to fill in an online survey after the VR session. The whole exercise was to encourage patients to express their thoughts and feelings without worrying about the social stigma associated with seeking mental health support and also to promote help-seeking attitude. Participants generally expressed more positive emotions and help seeking-behaviour after administering the VR protocols.

Gamito et al [21] harnessed VR technology to investigate whether VR exposure therapy, in comparison to imaginal therapy, can reduce symptoms of depression, anxiety and PTSD. The program consists of 12 sessions. The first session was dedicated to psychoeducation and the remaining sessions were based on three stressful war scenarios. All participants who completed the study reported decreased anxiety and depression and PTSD symptomology.

Cai et al [22] proposed a Virtual-Reality based neurofeedback therapy, in the form of a game, for treating depression. The prototype used three-electrode EEG collectors to record physiological activity of patients (in real-time) which is then fed to a data processing module which computes variables to dynamically change the VR game environment. For example, in a Nature Hike game prototype, changes could be made to sunlight intensity and bird-singing. The idea is to dynamically control the VR game stimuli to offer various levels of relaxation based on a patient's physiological feedback via EEG measurements. More than 90% of the participants reported the VR game platform to be effective and were willing to use it again.

Falconer et al. [13] used immersive VR to enable patients to practice self-compassion. First the individual is embodied in a virtual representation of themselves to deliver compassion towards a (generic) distressed virtual child. Then, the individual is embodied in the virtual child and experiences receiving compassion from their virtual self. Participants undertaking this procedure were found to decrease self-criticism and depressive symptoms and increase self-compassion. The proposed approach is like Self-attachment [40] to some degree, however there are some major differences.

In the Falconer et al [13] approach, the generic child avatar did not have any similarity to the participant undergoing psychotherapy. However, in the Self-attachment based approach [14], the user gets to interact with their customised childhood avatar which 1) resembles the user's childhood-self and 2) is more responsive to the user's affect which can change from Sad-to-Neutral, Neutral-to-Happy and then Happy-to-Joyful. It is hypothesized that a user's interaction with their own customised photorealistic childhood avatar makes the protocol more effective as a user may find it more fulfilling to deliver compassion to their child representation [14] [23] and also because the protocol requires them to deliver compassion to imitate a primary caregiver [15]. Another important difference is that the SAT protocol requires the formation of an 'affectional bond' between the adult self and the childhood self which activates dopaminergic pathways that can make the therapy more rewarding and can therefore motivate the user to continue practicing. Similarly, re-parenting protocols [14] include pleasurable activities such as dancing, messaging and singing

which are known to promote reward hormones such as dopamine and oxytocin and decrease cortisol levels [24][25].

### III. SELF-ATTACHMENT THERAPY

Psychological development is hindered if the child's social emotional needs are not met during early developmental years. Individuals with sub optimal childhood development history can show reduced capacity to regulate their affect, especially under stress. There is increasing evidence that sub optimal capacities to regulate emotion is the root cause of many psychiatric disorders[26]. A number of longitudinal clinical and non-clinical studies reinforces that early attachment insecurities was common among people with mild and severe mental disorders [27]. In [15], based on a neural model of care behaviour, it is argued that Self-Attachment may provide a more efficacious treatment method in attachment based psychotherapy.

To this end, Edalat [14] presents a psychotherapeutic method which enables individuals to re-train their sub-optimal attachment schema [14][28]. The therapy is rooted in the idea that many affect dysregulation disorders have their basis in early insecure attachment experiences [28], and, therefore, the method consists of a number of self-administrable protocols which aim to recreate the positive effects similar to that of an optimal infant-parent interaction(s). Under the Self- Attachment paradigm, the individual undergoing therapy role plays both as an adult self and the childhood self. The childhood self corresponds to the emotional self that becomes dominant under stress, whereas the adult self relates to the more rational part of the self, dominant under times of calm and low perceived threat. The individuals thus establish a compassionate relationship with their childhood selves and then, using love songs and dancing, create an affectional bond with them. The adult selves subsequently role play a good parent and interact with their imagined childhood selves to perform various developmental and re-parenting activities. The goal is to enhance their capacities for self-regulation of emotion, which can lead them into learning secure attachment. The different stages of the Self-attachment is supported by several computational models in the human brain and in associative artificial neural networks [29][15]. A quick overview of the four stages of the Self-attachment therapy [14][28] is displayed in the following Figure 2 by David Cittern [41, pg100]:

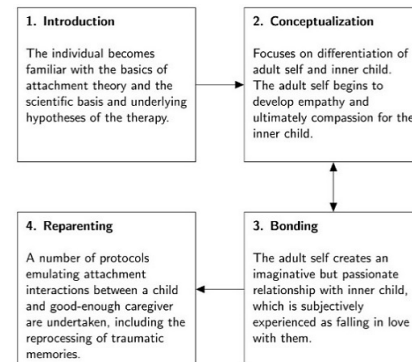


Fig. 2. Overview of the protocols of Self-attachment therapy (Image courtesy David Cittern [41, pg100])

Application of these protocols supplies the individual with the unconditional affection and love that characterises secure forms of attachment and provides scaffolding for the development of mental resilience and overall emotional well-being. The aim of the therapy is to create a secure attachment and affectional bond between the adult self and childhood self in order to enhance the capacity for emotion regulation within the individual and this is achieved using techniques such as mental imagery, which has the capacity to evoke emotional responses at neurophysiological and subjective levels and has been utilised in a wide variety of psychotherapeutic contexts [31][32].

#### A. Harnessing VR for Self-attachment protocols

The primary aim of this research was to build an immersive VR platform to enhance the efficacy of Self-attachment protocols. To achieve this, we propose extracted functional specifications for the VR platform which could improve Self-attachment psychotherapy experience. Some of the main features are as follows:

- 1) *Thorough literature review must be conducted to familiarize/learn about the state of the art VR platforms for treating various mental disorders.*
- 2) *Create a customisable photorealistic child avatar from a single childhood photo of the user*
- 3) *Facial and body feature customisation options such as face shape, eyes, skin colour, height, width clothing color etc.*
- 4) *The avatar should display basic emotions i.e. Sad, Happy and Fearful and should allow transition between them.*
- 5) *The platform should be interactive and easy to use.*
- 6) *The room should be customised to look like the child room.*
- 7) *Support for text to audio feature to read out important guidelines to the user*
- 8) *Should offer voice command support to transition between emotions.*
- 9) *The platform should offer both a high-end version (offers greater realism) and a low end mobile version (is scalable).*

More details about these features and their implementation is discussed in the subsequent avatar design and generation section.

### IV. AVATAR DESIGN AND GENERATION

Virtual reality is the state-of-the-art human-computer interface which uses computer graphics to create a realistic-looking virtual world that the user can interact with in real-time. Immersive VR platforms, tools and technologies are now commonly used in a wide variety of sectors including military, healthcare, education, entertainment, and construction, as well as for scientific visualisation purposes. VR has attracted the interest of public and investors alike in recent years. Tech giants including Facebook (Oculus), Google (Daydream, Cardboard and Jump), Sony PlayStation (PlayStationVR) and HTC (Vive) have made huge investments to accelerate research and innovation in mass consumable VR technologies which has made them more accessible at a much lower cost.

Innovation in VR is mostly driven by the gaming sector, which is currently worth 135 billion dollars each year, and is

expected to reach 174 billion dollars by 2021 [33]. With such promising profits in the gaming sector, it is becoming increasingly difficult to attract good programmers and designers to work in the healthcare sector which lacks an impressive budget. Despite these challenges, innovations in VR have impacted research in mental healthcare and psychotherapeutic interventions. Using VR, we can create and deliver highly realistic and immersive environments customised for specific psychotherapeutic intervention. Clinical Virtual Reality applications are being investigated for treatment of phobias, paranoid delusions, posttraumatic stress disorders (PTSD), chronic pain, eating disorders and cognitive rehabilitation. The main uses of VR in mental healthcare include complex exposure-based treatments which involve a patient's exposure to psychotherapy-specific customised virtual environment (s). VR-based exposure therapy has provided a cheap alternative to real-world exposure therapies. Therefore, in recent years, a spike has been observed in the VR-based treatments for treating mental health conditions [34]. A recent literature review [33] on VR in psychiatric disorders encourages using VR technology in treating depression; it emphasises the scale of the mental health crisis and also establishes the need to invest in the research and development of novel VR platform for treating depression.

#### A. Customisable photorealistic Avatar

Most of the protocols of the Self-attachment therapy requires that the user role plays as an adult and interacts with their childhood self (childhood-self). The conventional approach requires that individuals perform these interactions using their power of imagination i.e. users look at their childhood picture to recall childhood memories and then imagine that the child that they were is present with them and that they can hold, embrace and cuddle them to connect with them. The individual is trying to mimic a caring responsible parent who is reunited with their beloved child. We hypothesize that enabling individual's interaction with their childhood avatar in VR could increase the efficacy of the Self-attachment protocols. To this end, we decided to build a platform which enables an individual to generate their customised childhood avatar in VR from a 2D image.

#### B. High-end platform (Facebook's Oculus Rift)

##### 1) Oculus Rift

The Oculus Rift based platform offers better graphics than the mobile version but is costly as running it requires an expensive machine. The platform controls were implemented using VRTK's ray cast. The user could cast a ray on the buttons by pressing the joystick on the Rift controller followed by the trigger button to make a selection. They could use the ray cast control to navigate between different protocols of SAT and, they can select between different emotions. The platform also enables interaction with the child avatar i.e. the user can move closer to the child and embrace it with their hands, which makes the child transition from Sad to Neutral and then to Happy. Alternatively, they could use voice commands (Sad, Happy, Neutral and Joyful) to trigger an emotion.

##### 2) Oculus Quest

Quest is a self-contained VR system that allows good quality graphics without the requirement of a separate machine. Unlike Rift it is wireless, portable and offers touch control. The



prototype Quest version was built by Polydorou [35], reusing much of the code and animations from the original Rift build. It also has an interactive protocol where the user can embrace the child avatar to make him/her transition from Sad to Happy emotion.

### C. Low-end platform (Google's cardboard)

The Low-end version of the platform requires a Google cardboard and an Android phone. The quality of the graphics depends on the quality of the phone. The controls of the mobile version have been implemented using google VR's gaze controller. The user can stare on a button for a few seconds to make a selection. The user can switch between different protocol scenes by staring at another button; similarly, they can invoke different emotions within each protocol via gaze control feature.

### D. Emotions

An important aspect of Self-attachment is that the patient should be able to witness the child-avatar depicting Joyful (dance), Sad Happy, and Fearful faces and therefore try to empathise with all the basic emotions of the child and learn how to move back and forth between these, loosening their own rigid affects and mind-set. As of now we could only incorporate basic emotions offered by the Avatar SDK, however, in the future we plan to use other emotions such as: laughter and anger. One of the protocols require that the individual also enjoys and is impressed by the lively, playful, and dynamic character of the child-avatar and its zest for life, which should be displayed in the VR. Consequently, they establish a compassionate attitude towards their child-self. Various emotional states offered by our platform are displayed in Figure 4. The transition from Neutral to Happy is subtle, therefore we have added an emoji-icon to amplify the facial emotions displayed by the avatar for this version, however, in the future we plan to investigate techniques/animations to amplify facial animations of the avatar.



Fig. 4. Child avatar displaying emotions: Joyful (a), Happy (b), Sad (c) and Scared (d)

### E. Avatar Head

Booth's 3D morphable model can be used to extract facial features from a 2D, into-the-wild photo. However, using this approach results in an avatar which, though bearing some similarities to the subject, lacks photorealism (Summer [38]) as displayed in the following Figure 5.

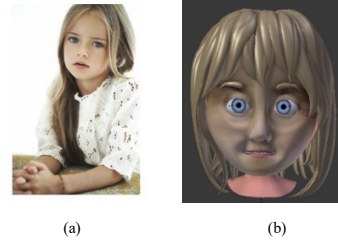


Fig. 5. Sample image [36](a); generated avatar face (b)[37]

The generated 3D head gave a cartoonish impression and was far from being photorealistic. We also investigated other popular platforms to generate 3D photorealistic avatar heads from a 2D picture such as Natural front 3D [38], and AvatarSDK[39]. It was decided to integrate AvatarSDK in our platform as it outperformed other platforms because of the following:

- 1) *First and foremost AvatarSDK's results were the best in comparison with other 3D avatar generation platforms*
- 2) *Head 2.0 also generated head mesh dynamically for each avatar. It helped us generate avatars which not only fit well in terms of texture, skin, eye, hair color but the generated head's shape also resembled the user head shape as shown in following Figure 6.*

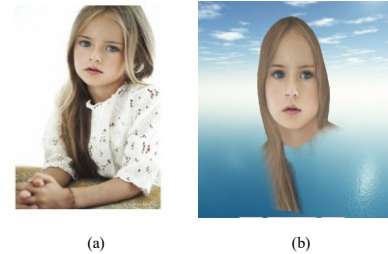


Fig. 6. Sample image (a) [36]; generated head using Avatar SDK (b)[39]

- 3) *The plugin works offline and can generate the required mesh quickly and locally without any need for the internet.*
- 4) *Once integrated with unity the head generation process was mostly automated*
- 5) *It allows further customisation to the generated head such as changing hair colour and style.*
- 6) *The SDK's unity plugin provides with an interface to join the head with the avatar body.*

The 3D head generated for the same sample image using AvatarSDK head 2.0 can be seen in Figure 6:

### F. Avatar Body

Avatar SDK's Fullbodysample scene was extended to implement virtual environment for the Self-attachment therapy. The Avatar SDK's customisation panel offered customisations to the generated head such as: changing hair colour, changing

size of the head, repositioning the head against x, y and z axis. The panel functionality was extended to include following additional customisation (see Figure 7):

- 1) *The body was replaced with a child avatar body.*
- 2) *Increase (+ button)/ decrease (-button) body height via upper buttons.*
- 3) *Increase (+ button)/ decrease (-button) body width via lower buttons.*
- 4) *Choose between 10 shirt colours.*

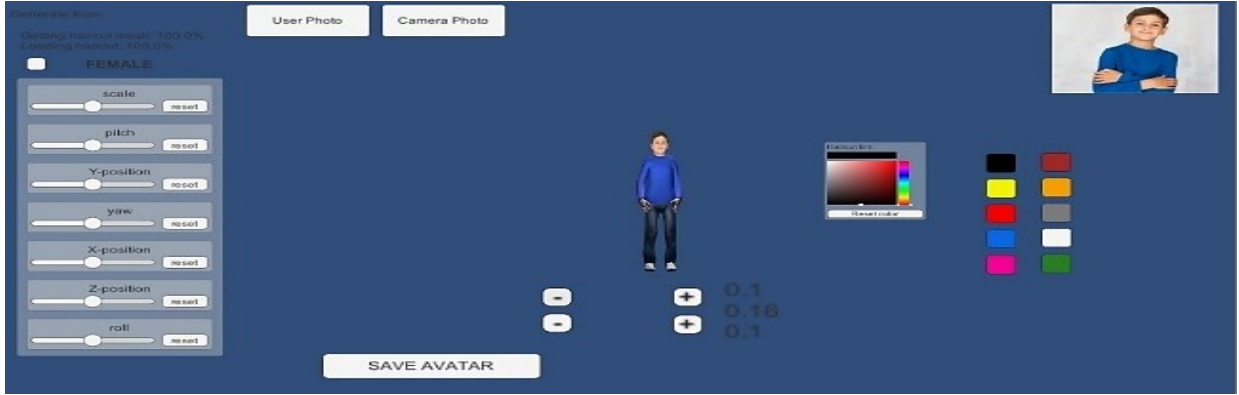


Fig. 7. Extended customisation panel

Once the user has done the customisations they can import their avatar in the Self-attachment protocol scenes. Self-attachment has a sizeable set of protocols, but the details of all scenes for these protocols are out of the scope of this paper. In Figure 8, we display a scene for one SAT protocol consisting of a child room and a customised childhood avatar of the user.



Fig. 8. A VR scene for practising protocols of the Self-attachment therapy

The platform enables the user to see transition between different emotions such as Joyful (dance), Happy, Scared, and Sad.

## V. METHODOLOGY & RESULTS

Self-attachment protocols, as already explained, require that the user role play as an adult and interacts with their childhood self to perform positive parenting activities to achieve secure attachment. This is achieved through SAT protocols which require that the user employ their Happy and Sad childhood pictures to invoke their childhood memories and then imagine that the child that they were is present with them. The user then establishes an affectional bond/relationship with the child before they can perform positive parenting activities with the imagined child. We posit that a customised photorealistic childhood avatar in place of a simple childhood picture could enhance the overall

psychotherapy experience and thus increase its efficacy for many users. To this end, we conducted a validity study in which the participants were required to recall their childhood moments by first using their pictures and then by using their customised photorealistic avatar using MobileVR and Oculus Quest. The ethical approval for the study was obtained from the Imperial College London Ethics Committee to conduct these non-randomized uncontrolled single-arm trials involving both versions of our platform.

Due to COVID-19 guidelines, all trials were conducted remotely; a set of instructions for the installation and

configuration (for both MobileVR and Oculus) along with the participation information sheet were shared with all participants via email. The users could test the platform(s) for a week after which they were required to fill an online questionnaire and a demographics form. All data for the remote trials was gathered via Qualtrics. The results of the trials are as follows:

### A. Low-end version

All participants were required to go through a participation information sheet and then sign a consent form before they could proceed with the trial. For each participant, a customised Android VR application, containing their customised avatar, was built and shared. A total of 15 participants were recruited via social media platforms; majority of the participants for our trials were in their twenties. The average age of the group was 30.3 (SD= 7.9) and both the mode and median age was 27. There were 11 males and 4 female participants. The level of qualification for majority of the participants was post-graduate. For each session they were to use their picture and then experience interacting with their customised photorealistic childhood avatar using an Android phone, placed inside a google cardboard. After administering both sessions the users filled a questionnaire to report their experience using photos versus their customised avatar. The questionnaire had seven questions to evaluate the overall realism of the child-avatar, virtual environment, and the whole experience. Some questions also investigate whether the users were able to relate with their childhood avatar (in VR) better than their childhood pictures. Nearly 85% of the participants (N=13) reported their avatar in mobileVR to be more relatable than their ordinary pictures.

## B. High-end version

Due to the Covid-19 pandemic we weren't able to conduct trials for the Oculus Rift version of the platform, however, we were able to reuse much of our Oculus Rift code to build a prototype for the Oculus Quest in collaboration with Polydorou [35]. Six participants from the low-end trials, who had access to an Oculus Quest, were recruited for the trials of the high-end version. One volunteer could not complete due to personal reasons, while the other six participants read the participation information sheet and signed the consent form before starting the trial. After the trial they reported their feedback via an online questionnaire. The questionnaire for Quest had two additional questions to investigate whether the users found their childhood avatar in Oculus Quest better than 1) MobileVR and their 2) childhood photos. All participants reported Quest to be more realistic and interactive than the mobileVR. Moreover, all six participants found their customised childhood avatar (both in mobileVR and Quest) to be more relatable than their ordinary photos.

## VI. CONCLUSION & FUTURE WORK

State-of-the-art virtual reality systems are transforming various sectors such as military, education and healthcare. Advances in virtual reality technology, especially the availability of photorealistic human-like avatars, is making the virtual reality experience more personalised and realistic.

In this paper, we shared our experience building a novel psychotherapeutic tool which makes use of photorealistic customisable avatars to improve the efficacy of the Self-attachment psychotherapy. The findings from our implementation of both the high-end and the low-end versions could help researchers make better, more interactive, and highly realistic virtual reality experiences in the future. We now plan to conduct a randomised controlled trial to test the efficacy of our platform in treating clinical patients with symptoms of chronic anxiety and depression.

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