Virtual Reality Usage in Therapy or Training in the Military

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ABSTRACT

This study was designed to …

Keywords

Psychology, therapy, virtual reality, military, post-traumatic disorder, simulated environment, exposure therapy, imaginal therapy, acoustic therapy

CSS Concepts

- **Social and professional topics → Computing education;**
- **Human-centered computing → Human computer interaction (HCI) →** *User studies Virtual reality;*

INTRODUCTION

There is an abundance of research similar to one another that strives to further treatment in patients with post-traumatic stress disorder (PTSD). Unfortunately, many of these studies often experience high drop-out rates, particularly among recent veterans and service members [3]. In addition, despite large treatment sizes, approximately one-third to one-half of patients who undergo prolonged exposure (PE) do not demonstrate clinically meaningful symptom change [3]. There are limitations to accurately gauging the effects and results that therapy can provide, so psychophysiological assessments must further be conducted with each study [2]. This research will aim to provide insight for how military training can benefit from the various methods found.

Motivation

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Despite the similarities in the goal of treating or training military personnel, there are different methods that each therapy and training has been focused on so far. From imagery rescripting to the refinement of acoustic therapy, both have further vast potential to be expanded on. In many ways, it is very possible to combine the two in order to create a cohesive virtual environment that optimizes the use of both auditory and visual senses.

Furthermore, each therapy and training lack a sense of individuality for each participant. After assessing individualized needs, more research to fully understand what a participant needs can provide a more effective insight into the treatment or training needed to ensure better results.

An effective way to measure a participant's level of distress is via Subject Units of Distress (SUDS), meaning that the baseline and within-session/between-session habituation levels are measured entirely on subjective responses. These measurements were taken in tandem by the researchers alongside the symptoms observed in the patients. However, it is important to target objective results as well. This is done through psychophysiological measurements such as heart rate and skin conductance. Although this means that more variables are to be introduced in the research, it is perhaps the most important measurement to be studied.

Related Work

Most similar work is directly related to acoustic research [4], imagery rescripting [3], and few training studies [14] [15].

Contribution

This experiment will contain various ideas that, in the future, can hopefully be run on potential or current military personnel. The findings may lead to further research that can ultimately contribute to how military personnel can be better treated and prepared for the effects of combat experience.

Research Questions

(1) Can auditory or visual imagery exposure in virtual reality improve results in both military training and therapy? (2) Is either the auditory or visual sense more effective in the results provided by training or therapy? (3) How can these forms of therapy and training be assessed and used with psychophysiological measurements in the future?

Hypotheses

(1) High responders will react more to "distressing" audio and images. (2) Regardless of audio frequency, high responders will still react strongly to "distressing" audio. (3) High responders may react less to "calming" music, though this depends on the audio frequency. (4) High responders may be on edge with "calming" music if it is not adapted to their threshold (baseline) of what is comfortable.

METHODS

Softwares and Materials

The simulated environment created and used for this study was developed in Unity. Unity is a real-time development platform that can create programs such as games. The language Unity uses for its user interface scripts is C#. This is where the visual scenes used in both training or therapy are created.

The survey given to the participants after the procedure was created using Google Forms. [1] Questionnaire keep in mind patients not fully engaged with trauma memory…

Both the video and audio files were created using separate programs. The audio and video files were found through various free public domain websites. Some audio files were taken from freesound.org. The sounds were manipulated and edited through Garage Band.

iMovie to splice Unity clips.

Simulated Environments

Audio-no environment. Visual-no audio. Combine?

Participants

As this study is unable to host any of the targeted audience, the participants are the students of the CS464 class. The final video and audio clips will be presented to the class as well.

The target participants under different circumstances would be those either training to serve in the military or those suffering the effects of PTSD. Despite the large number of participants that could potentially benefit from either this training or therapy, there is an exclusion criterion I would have to implement:

(1) Those who are at a level of self-harm that requires immediate focused intervention, (2) unmanaged psychosis or bipolar disorder, (3) alcohol or substance dependence in the past 3 months [1], (4) currently involved in abusive relationships or confronted with overwhelming stress, (5) present evidence of acute psychosis or severe dissociation [3]. In order to ensure that acoustic therapy or training could be implemented properly for research purposes, those with hearing problems would also be excluded [4].

Procedure

- (1)

RESULTS

Discussion

- (1)

Implications

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Limitations and Challenges

As this is not conducted on people, only presented. Physical properties cannot be recorded as well.

CONCLUSION

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Future Work

[3] Those with more severe psychiatric disorders to take into account. Tailoring for more individual treatment.

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