Usage of Virtual Reality in Exposure Therapy and Imagery Rescripting for Veterans Affected by PTSD: A Pre-trial Study

Research Questions

Can auditory and visual imagery exposure in VR improve results in PTSD therapy?

- Exposure Therapy
  - The gradual introduction of stressful or traumatic stimuli to a patient as a means of encouraging the development of mental strength and coping mechanisms required to limit the negative effects brought on by encountering these stimuli.
- Acoustic Therapy
  - The use of instruments in combination with therapy to help patients adapt to hearing what could be perceived as triggering sounds while in a safe environment.
- Combining the therapies in VR

Did including an audio component aid in creating a more realistic VR experience?

- What does realistic mean?
  - Was the participant immersed? To what extent?

- What role does acoustic therapy play in a virtual environment to help achieve this?

How can this new proposed form of therapy be assessed and employed with psychophysiological measurements in the future?

- What are psychophysiological measurements?
  - Heart rate
  - Skin conductance

- Subject Units of Distress
  - 1-10 scale

Hypotheses

“

Using the calming VR experience directly after the distressing VR experience will aid in suppressing the negative reaction following the PTSD triggering environment, acting as a faster and more effective image rescripting therapy.

> Including the audio component in VR will aid in making the VR experience more realistic, and ultimately increase patient success rates.

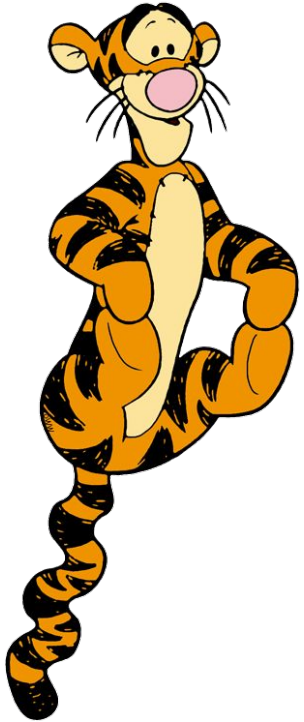
Relevant Literature

Exposure Therapy

- “Trauma management therapy with virtual-reality augmented exposure therapy for combat-related PTSD: A randomized controlled trial”
- “The efficacy of virtual reality exposure therapy for PTSD symptoms: A systematic review and meta-analysis”
- “A Virtual Reality Exposure Therapy Application for Iraq War Military Personnel with Post Traumatic Stress Disorder: From Training to Toy to Treatment”

Imagery Rescripting

- “Imagery Rescripting for Recurrent, Distressing Images”



Acoustic Therapy

- “Auditory sensitivity in survivors of torture, political violence and flight-An exploratory study on risks and opportunities of music therapy”

Experiment

Main Menu/Instructions

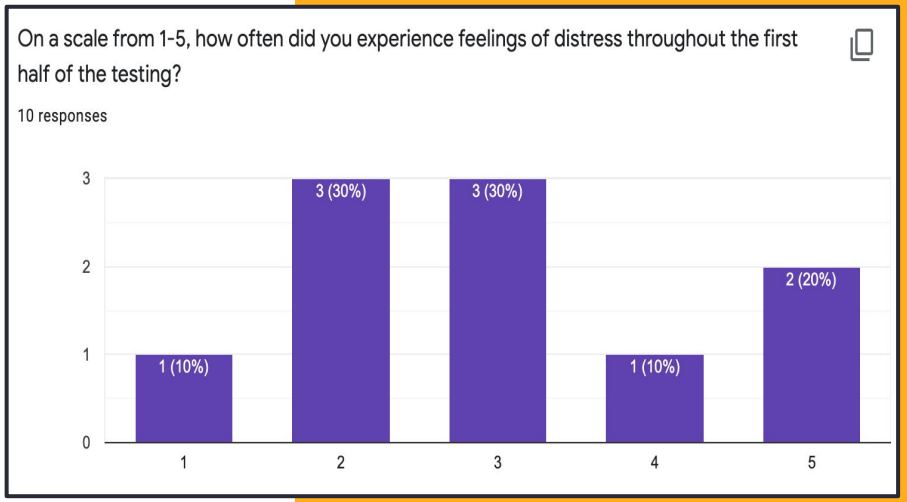
Distressing Environment

Calm Environment

Results

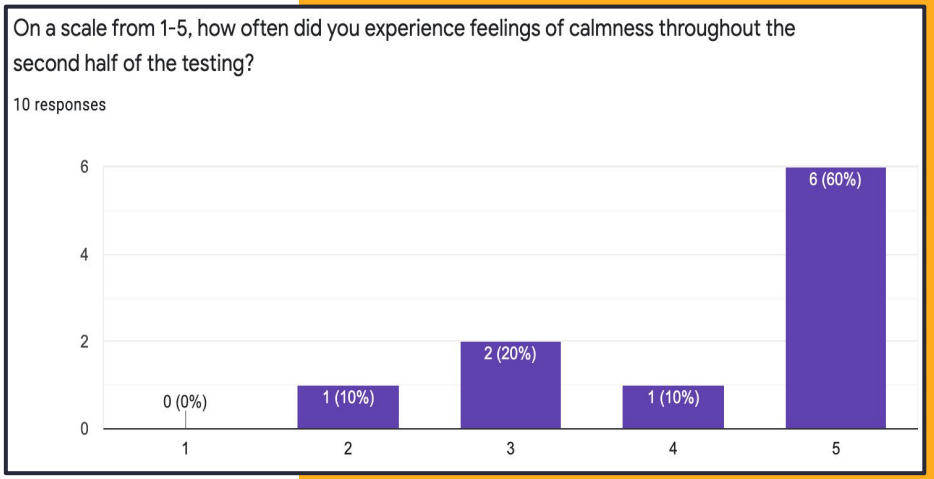
Distress Scale

On a scale from 1-5, how often did you experience feelings of distress throughout the first half of the testing?



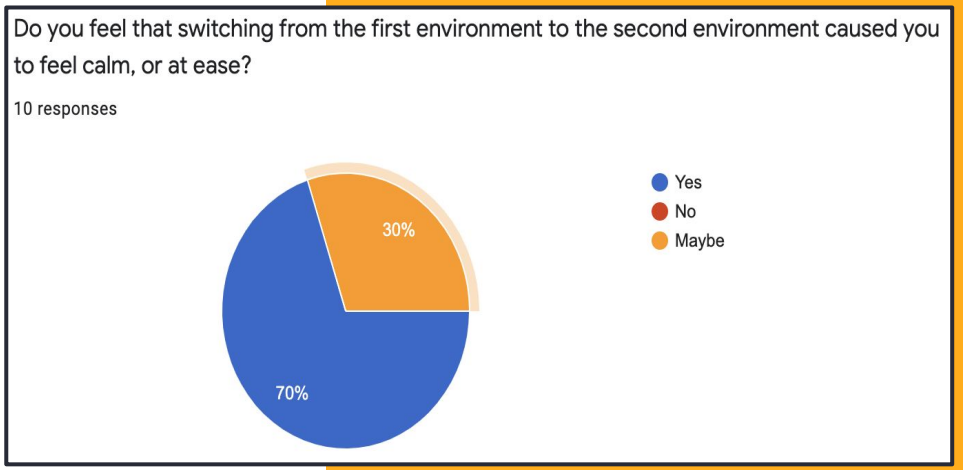
Calm Scale

On a scale from 1-5, how often did you experience feelings of calmness throughout the second half of the testing?



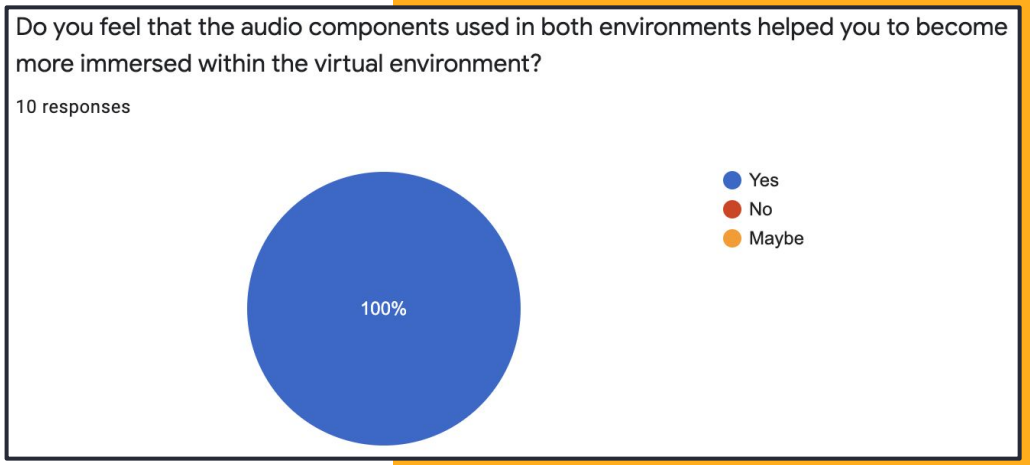
Switching Scenes

Do you feel that switching from the first environment to the second environment caused you to feel calm, or at ease?



Audio Immersion

Do you feel that the audio components used in both environments helped you to become more immersed with the virtual environment?



Results

Implications

- Support first hypothesis
- Not enough data to support second claim of the hypothesis
- First claim in second hypothesis supported

Limitations and Challenges

- Participants and sample size
- Lack professional equipment for psychophysiological measurement
- Subjective imagery
- Technical experience

Future Work

360-Degree VR video

- Increase immersion
  - Consider trauma degree
- Transition to real world

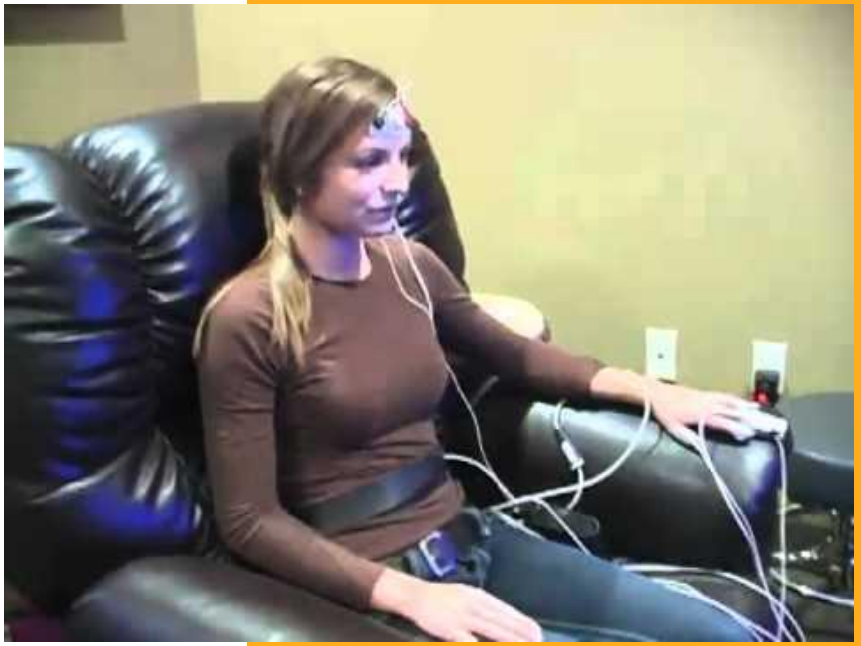
Audio Immersion

- More sophistication and customization

- Increase intensity per session
  - Certain triggers
  - Sound loudness

Psychophysiological Data

- Use rates in future
- Expansion in various fields



Conclusion

Works Cited

Image:

- Tigger (fhttps://www.disneyclips.com/images/tigger1.html)

Relevant Literature (more can be found in the GitHub repository):

- *Virtual reality in the assessment, understanding, and treatment of mental health disorders* (Cambridge University)
- *Can Virtual reality exposure therapy gains be generalized to real-life?* (Morina N, ettc.)
- *Virtual reality exposure-based therapy for the treatment of post-traumatic stress disorder…* (Cristina Botella, etc.)

Youtube:

- The Fight for Falluja | 360 VR Video | The New York Times (https://www.youtube.com/watch?v=_Ar0UkmlD6s)
- Willmarth Psychophysiology Brief Assessment.mp4 (https://www.youtube.com/watch?v=C07-KvQx-Vw)

Thank you!

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