The Differential Effects of Active and Passive Bilateral Stimulation

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Background

Eye-Movement Desensitization and Reprocessing (EMDR) therapy is a common psychotherapeutic method used to treat severe trauma.

One proposed mechanism for EMDR is Bilateral Stimulation (BLS) within the brain.

Active stimulation produces greater responses than passive stimulation.

Hypotheses

Participants in BLS conditions will experience decreased distress following the interventions.

Participants in the active BLS (BAE and BAT) conditions will experience more significant reductions in distress compared to the passive BLS (BPV) and control (UAT) conditions.

Study Design

Fig. 1 (Right) A schematic of the experimental methodology.

- Equipped with eye-tracking and cardiac monitoring

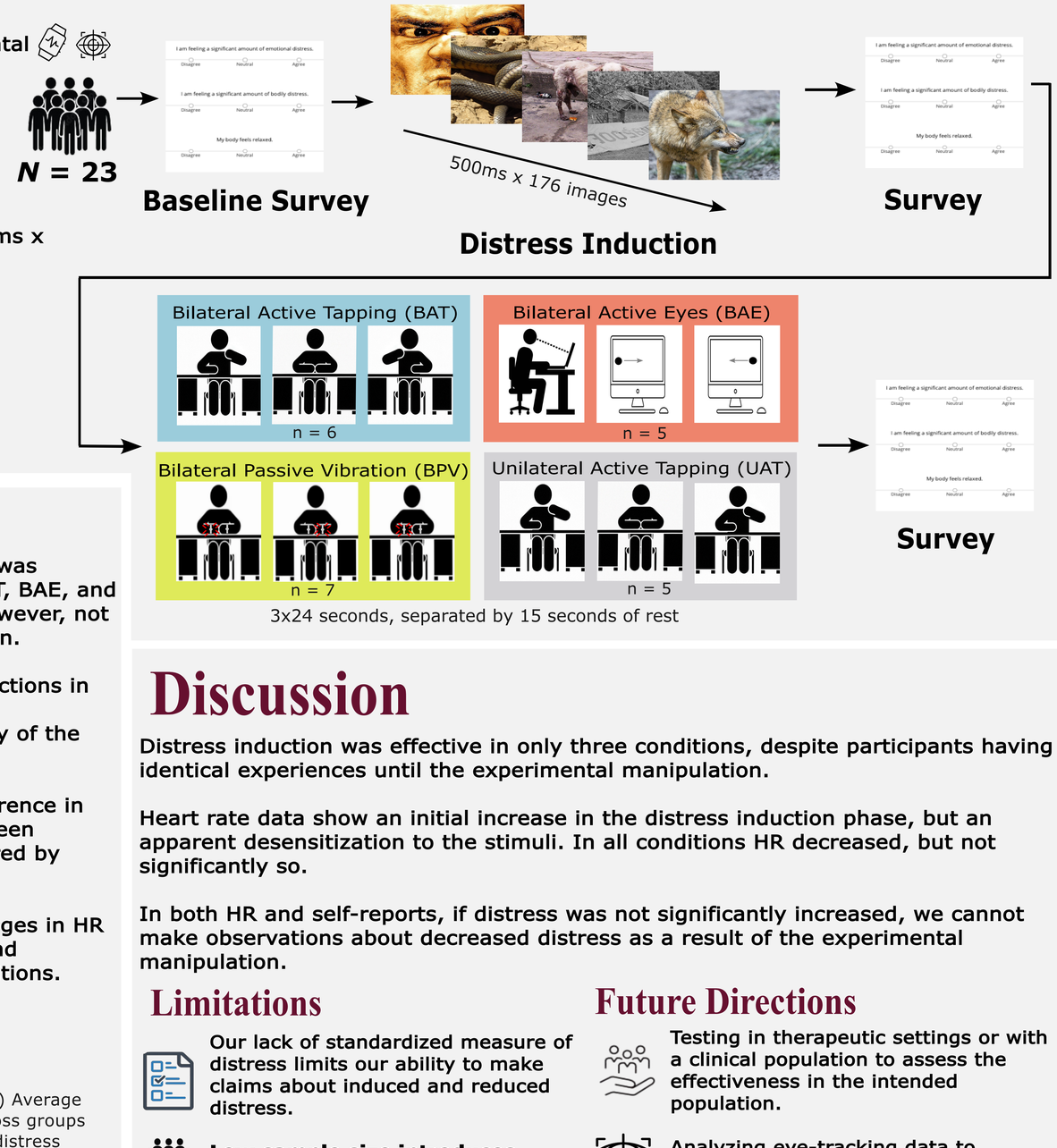
- Completed baseline distress measure

- Viewed distress-inducing images for 500 ms x 176 images

- Completed distress measure

- Randomized into condition. Completed intervention for 3 cycles of 24 seconds, separated by 15 seconds of rest

- Completed distress measure



Results

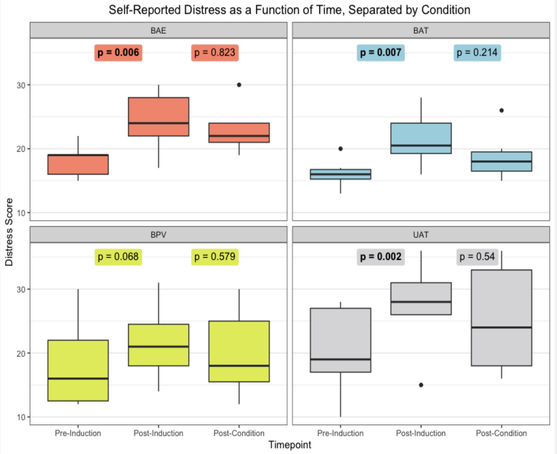


Fig 2. (above) Survey response data, separated by condition. Significant effects were observed between the Pre-Induction and Post-Induction time points in the BAT, BAE, and UAT conditions. No significant effects were observed Post-Condition.

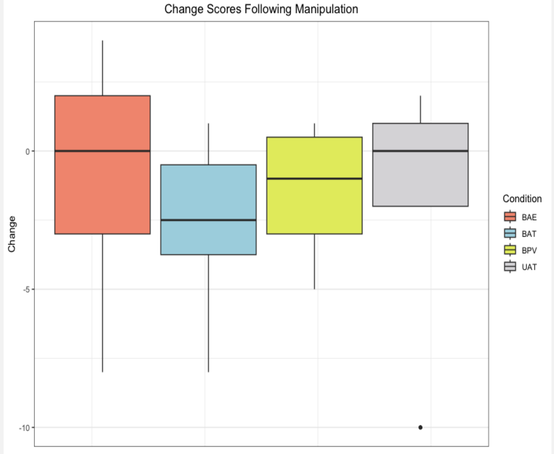


Fig 3. (above) Change scores from Post-Induction to Post-Condition. Negative change scores indicate reductions in distress; a value of 0 indicates no change in distress. No significant differences in effectiveness between condition.

Key Points

Distress induction was effective in the BAT, BAE, and UAT conditions, however, not in the BPV condition.

No significant reductions in distress following manipulation in any of the four conditions.

No significant difference in effectiveness between conditions, measured by change scores.

No significant changes in HR across induction and experimental conditions.

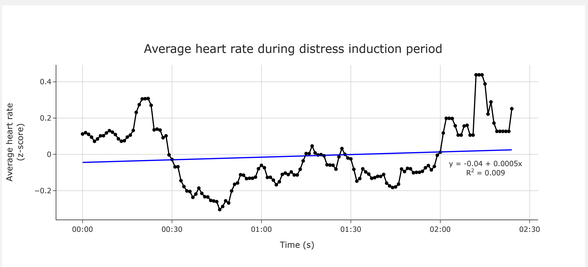


Fig 4.

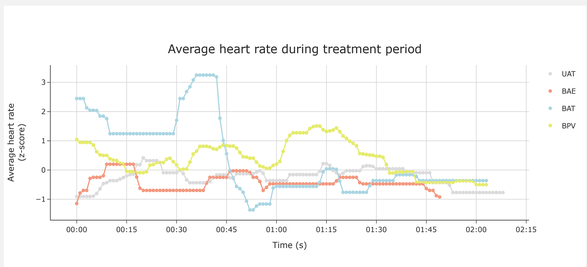


Fig 5.

Fig 4. (far left) Average heart rate across groups during the distress induction. HR increases in the first 30 seconds and then decreases.

Fig 5. (left) HR throughout the experimental manipulation in each condition.

Discussion

Distress induction was effective in only three conditions, despite participants having identical experiences until the experimental manipulation.

Heart rate data show an initial increase in the distress induction phase, but an apparent desensitization to the stimuli. In all conditions HR decreased, but not significantly so.

In both HR and self-reports, if distress was not significantly increased, we cannot make observations about decreased distress as a result of the experimental manipulation.

Limitations

Our lack of standardized measure of distress limits our ability to make claims about induced and reduced distress.

Low sample size introduces significant noise in the data.

We did not control for participants' distance from the screen in the BAE condition, introducing variance in the degree of eye movements.

Future Directions

Testing in therapeutic settings or with a clinical population to assess the effectiveness in the intended population.

Analyzing eye-tracking data to improve the methodology of the experiment.

Assessing the effectiveness of BLS as an acute treatment immediately following distress, and assessing whether these effects can be sustained over time.

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