

Listen to Your Heart: A Preliminary Investigation on the Impact of Sound Therapy on Heart Rate Variability

Lucy Warhurst and Andrew Kemp
University of Sydney

Background

- Depression and anxiety adversely impacts on heart rate variability (HRV), which may have future physical health implications (i.e., heart disease and obesity; 1).
- Sound Therapy claims to target and reduce stress and anxiety in the 'worried well'.
- Evidence for the efficacy of Sound Therapy in healthy adults is lacking.
- Principles derived from the polyvagal theory (2) provide a potential mechanism for the impact of Sound Therapy.
- This study aimed to investigate the acute and longitudinal effects of Sound Therapy on HRV and selected behavioural measures of psychological wellbeing.

Hypotheses

Experiment One: Acute Effects

1. Acute exposure to Sound Therapy and Control (classical music) will increase HRV relative to resting state.
2. Impact of Sound Therapy on HRV will be greater than classical music control.

Experiment Two : Chronic Effects

1. Increase in resting-state HRV from initial assessment to final assessment for the Sound Therapy group.
2. Increase in measures of psychological wellbeing from initial assessment to final assessment for the Sound Therapy group.

Method

- Double-blind, randomised controlled, mixed experimental design
- Sound Therapy devices contained classical music (e.g., Mozart sonata) which had been filtered to contained increased energy at high frequencies relative to low frequencies and diminished energy at low frequencies. Control devices contained the same music, unfiltered.

Experiment One

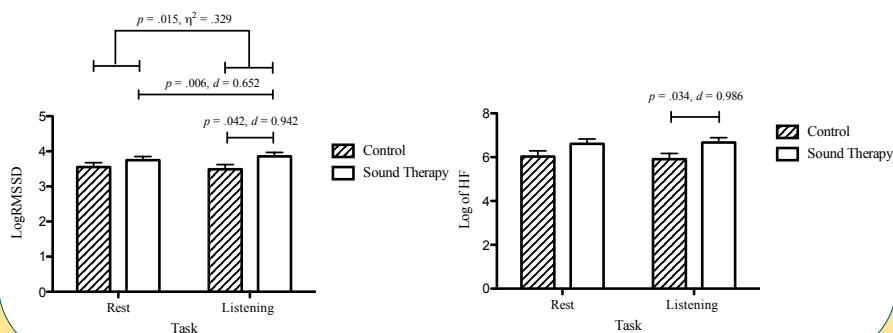
- 24 Healthy adults participated in Experiment One
- HRV variables (LogRMSSD, LogHF) were calculated from electrocardiography (ECG) during rest and exposure to Control or Sound Therapy

Experiment Two

- 15 healthy adults participated in Experiment Two
- Pre and post assessments were completed 3-months apart with participants listening to Sound Therapy devices for 1-3 hours a day.
- The DASS-42 and WHOQOL-BREF were completed at pre and post assessment.

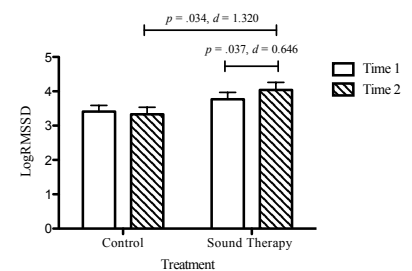
Experiment One: Main Findings

- Sound Therapy increased HRV relative to resting-state baseline, and Control.
- HRV did not increase under exposure to classical music control, relative to baseline.



Experiment Two: Main Findings

- HRV did not change following exposure to Sound Therapy or Control across the long-term, $F(2, 12) = 2.42, p = .131$.
- Specific comparisons did revealed increases for Sound Therapy group on LogRMSSD, relative to Time 1 and Control.



- No effects were observed across behavioural assessments of psychological wellbeing.

Conclusions

- Participants who were acutely exposed to Sound Therapy showed improvements on well-established measures of vagal regulation, over and above participants who were exposed to a classical music control.
- Taken together, the increases in HRV induced by Sound Therapy and the null effect of classical music on HRV support the notion that exposure to balanced levels of high and low-frequency sound causes increases in HRV. The long term effects of Sound Therapy on HRV and psychological wellbeing remain unclear.
- Sound Therapy induced changes in HRV give insight into the link between the MEMs, cranial nerves and the heart.

Limitations:

- Although the current study found acute effects of Sound Therapy on HRV, the manner in which these effects were produced are not able to be illustrated directly. In order to provide a plausible explanation, several aspects of the mechanism require investigation (e.g., middle ear muscle tone).
- Experiment Two lacked control and rates of attrition were high, potentially explaining the null effect of Sound Therapy in the long-term.

Acknowledgements

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References

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Contact: Lucy Warhurst
lwar9045@uni.sydney.edu.au