

Falco Enzler, PhD, AudioVitality SA, Lausanne, Switzerland

Technology



- Soundproofed studios
3 overhead speakers
1 subwoofer
Av. level: 72 dB SPL
- 40-80 Hz pure tones (with harmonics)
- Bimodal auditory + somatosensory stimulation

AudioVitality studios and sounds (RubesaSounds) are designed to foster **bimodal stimulation via low-frequency sounds**.

Mechanoreceptors in the body (Pacinian- and Meissner- corpuscles) are tuned to similar frequency ranges and perceive vibration sensations¹.

The field of low-frequency vibroacoustics has gained traction as an application in healthcare² through **stress management via parasympathetic activity increase**³, and in favoring muscle soreness recovery post-exercise⁴.

Lastly, RubesaSounds contain binaural beats to favor deep relaxation. A growing body of evidence indicates an effectiveness of binaural beats for **anxiety reduction**⁵ and **sleep improvement**⁶.



Effect on Heart Rate Variability (HRV)

Hauser et al.⁷ investigated whether a single AudioVitality session would have an effect on HRV metrics.

HRV is considered a biomarker of the autonomic nervous system response. Generally, **high HRV metrics show parasympathetic dominance and a rested state, while low HRV is associated with sympathetic dominance and states of fatigue**⁸.

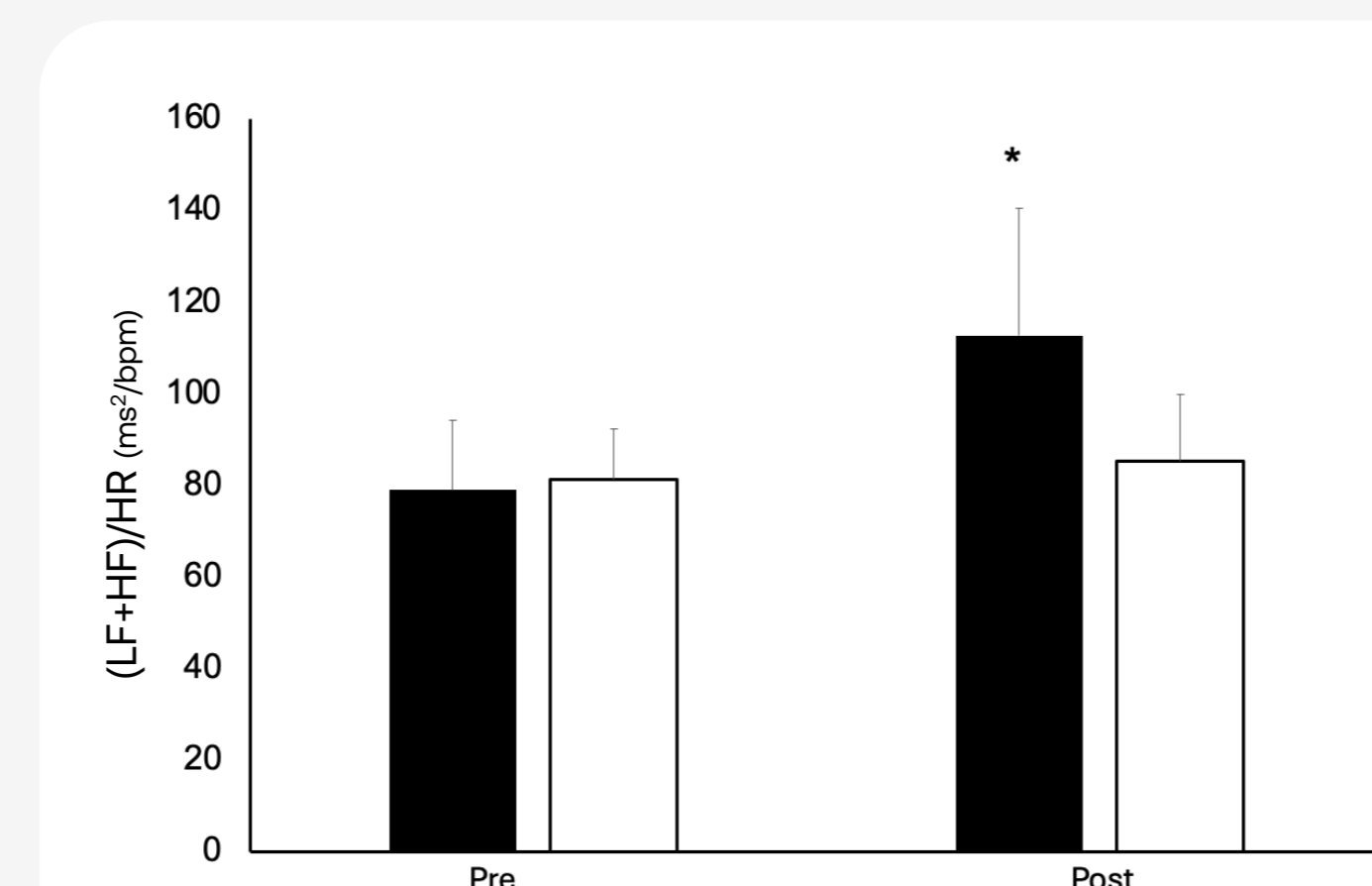
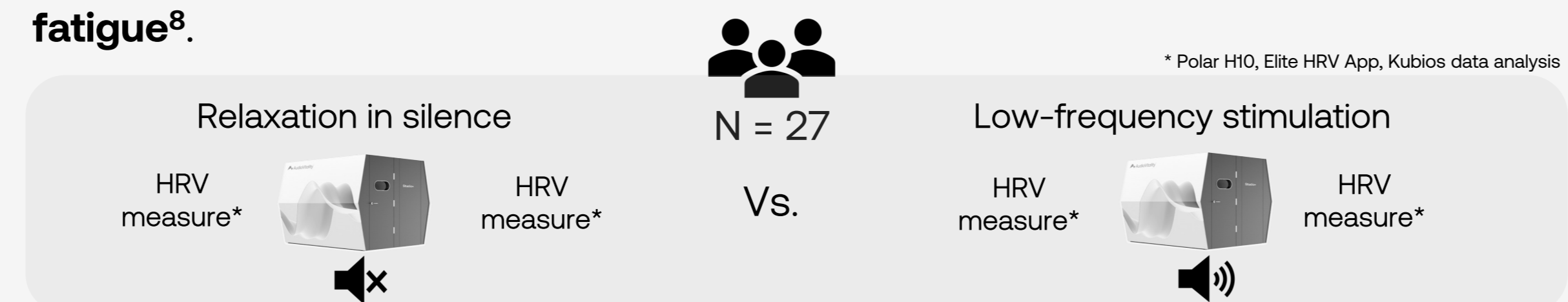


Figure 1 : Mean (LF+HF)/HR for both groups measured at two time points, adapted from Hauser et al.⁷. "Pre" measured at baseline. Post measured 30 minutes after end of stimulation/relaxation. Low frequency measures in black, relaxation in white. Error bars show standard deviation. Repeated measures ANOVA. * = significant difference between Pre and Post, p < 0.05.

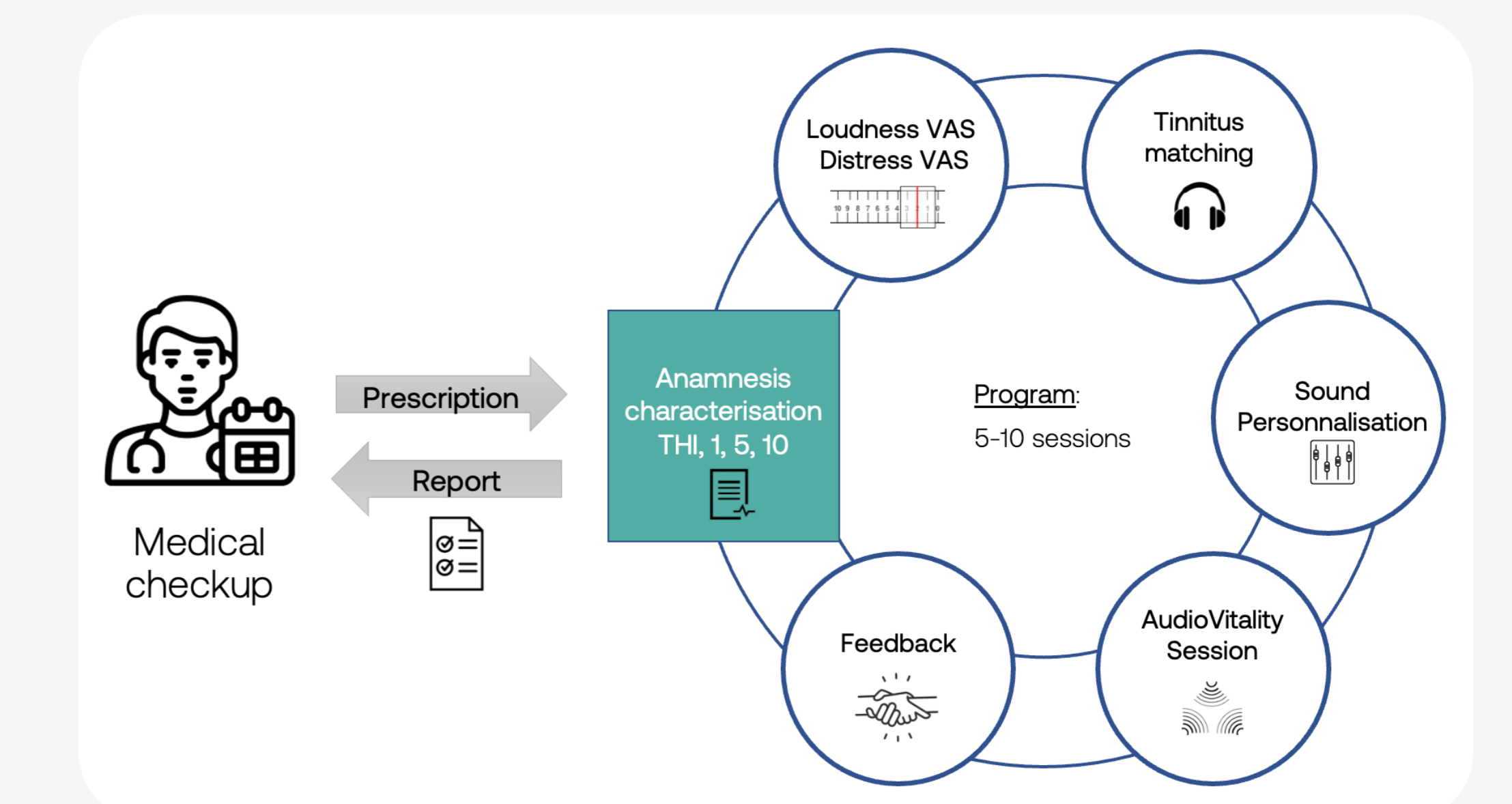
Hauser et al.⁷ found a **significant increase in HRV ((LF+HF)/HR)** 30 minutes after the end of a low-frequency sound session (compared to baseline), while there was no significant increase when no sounds were played.

This finding suggests an impact of low-frequency sounds on increasing parasympathetic activity, favoring relaxation, and readying the body to respond better to stressors.

Implications for Tinnitus management

Stress can be a strong modulator of tinnitus distress and this modulation can be bi-directional⁹. Decrease of tinnitus distress has been found to cooccur with HRV increase¹⁰, yet it isn't clear which modulates which. Taken together this may still suggest that **relaxation approaches that favor parasympathetic dominance may help tinnitus sufferers live better with tinnitus**.

AudioVitality leverages deep relaxation low-frequency sessions combined with tinnitus objectivation data tracking and counseling through multiple sessions.



Internal results on THI scores show promising results. A retrospective study publication of this data is being prepared.

Discussion

In addition to potential mechanisms of action linked to increased HRV, bimodal stimulation may also play a potential role in helping tinnitus sufferers. Indeed, the use of bimodal stimulation is emerging as a novel approach for tinnitus management^{11, 12}. Hence, **low-frequency stimulation's benefits may also originate from similar mechanisms of action found in targeted bimodal stimulation**¹², albeit with a broader range of somatosensory activation (whole-body). Further studies are warranted especially considering that the involvement of the somatosensory system with respect to tinnitus is gathering more and more interest and evidence¹³.

References

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