

## Objective

Performance anxiety in musicians (MPA) can be defined as a subentity of social fears with a prevalence of 15-25% amongst professional musicians (1). Typical symptoms of MPA are a subjectively experienced fear of failure or loss of control and - on a physical level - the consequences of an increase in sympathetic tone with cardiac stress. There is evidence that, analogous to anxiety disorders, music performance anxiety is generally associated with an increased risk of cardiovascular diseases. The therapy of choice for anxiety disorders is cognitive behavioral therapy with exposure and the therapeutic use of virtual reality has already been well established (2). There are hardly any therapy studies on music performance anxiety which apply virtual reality exposure training (VRET) and investigate cardiovascular changes throughout the therapy (3,4).

## Methods

- Two cohorts of at least **30 professional and amateur musicians** including music students will be recruited
- General and specific psychometry (Mini Dips) is applied to diagnose music performance anxiety based on an clinical interview using ICD-10 and DSM-V criteria for specific phobia respectively social anxiety (see Fig. 1)
- A **behavioural assessment test (BAT)**, representing an audition in a concert hall, is conducted in a **Cave Automatic Virtual Environment (CAVE, Fig. 4)** at three times before (T0), shortly after (T1) and one year after (T2) the intervention while musicians perform two different musical pieces (virtuose and slow)
- Over the following **two weeks the intervention group** receives a therapist-led virtual reality exposure treatment with **360° videos** of different authentic audition and concert scenarios (see Fig. 2 & 3) twice a week
- The control group is introduced to the **progressive muscle relaxation (PMR, see Fig. 1)**

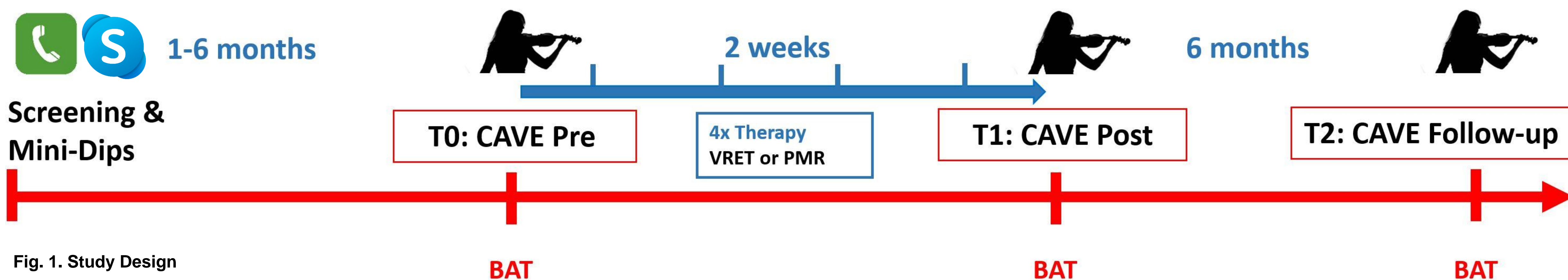


Fig. 1. Study Design

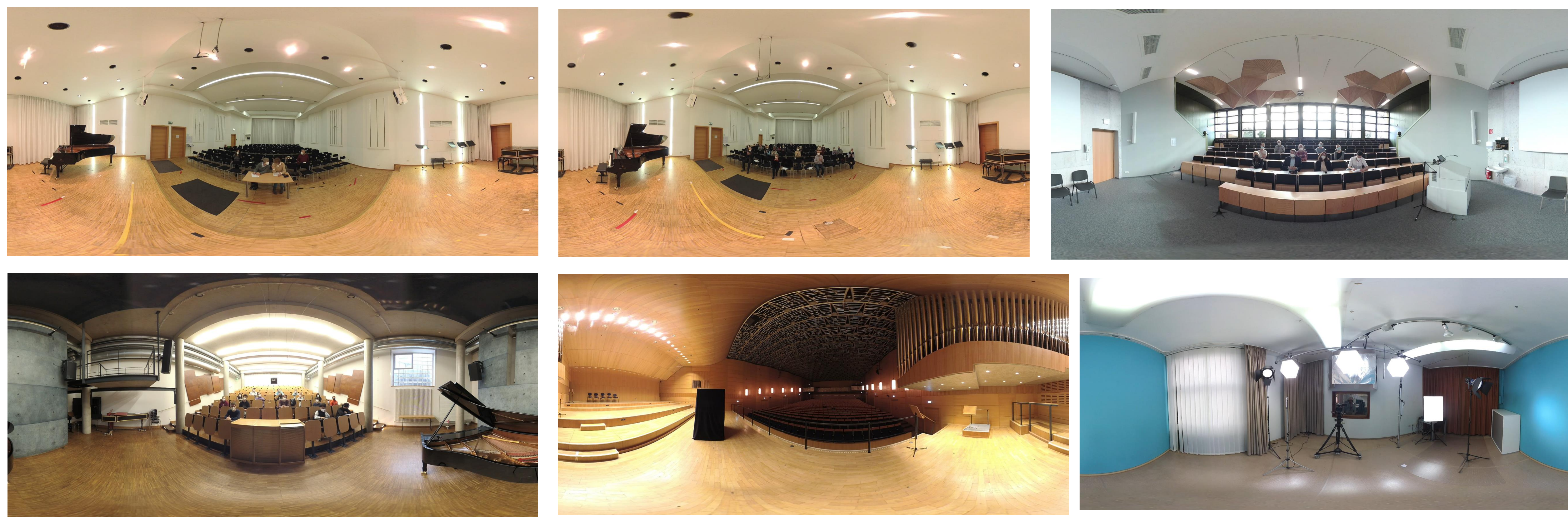


Fig. 2 Eight examples of the 360° videos as different authentic audition and concert scenarios



Fig. 3 Virtual reality exposure treatment: Cabine and Head-Mounted Display (HMD)

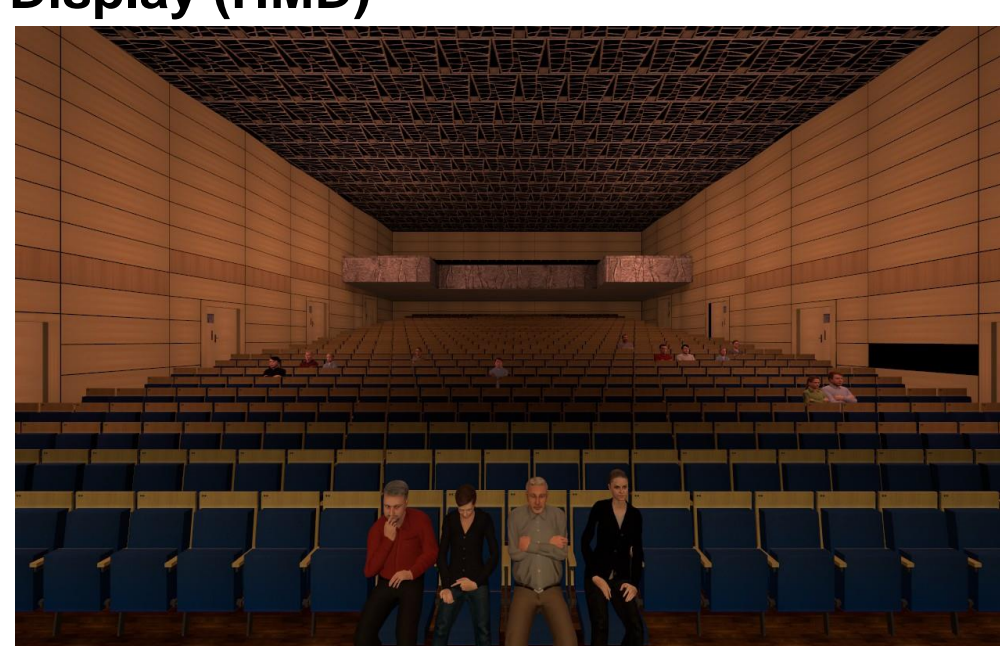


Fig. 4 CAVE Setting with Audition

## Outcomes and Results

Primary outcomes are the music performance anxiety measured by **questionnaire** (Bühnenangstfragebogen) and the cardiovascular reactivity reflected by the **heart rate variability** and **blood pressure**. Secondary outcomes are stress parameters such as **cortisol in blood** and saliva, **neuropeptides** as well as further molecular changes, such as **DNA-methylation**. All outcomes are assessed at the BAT (see Fig 1). Since the study is currently still ongoing, the data collection will be expected to be finished by March 2024. So far, we have carried out the therapy training (T1) with **30 musicians** (Aug. '23).

## Conclusion

The following study aims to investigate the effect of virtual reality exposure treatment (VRET) in musicians with performance anxiety (5). We expect a reduction of anxiety but also a consecutive improvement of HRV with cardiovascular protective effects. The application of VRET could be implemented for therapy as well as in terms of prevention of MPA.

## References

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