

## Heart rate variability in a series of music performance auditions

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### Abstract [285 words]

**Background:** Monitoring of heart rate (HR) and heart rate variability (HRV) offers an objective, non-invasive means for assessing cardiovascular autonomic regulation. An experimental study was performed to measure HRV responses in relation to specific features of the orchestral audition process for musicians.

**Methods:** A light-weight, portable, non-invasive heart rate monitor was used to record HR and HRV in young performing instrumentalists (8 female, 2 male) before, during and after (1) an audition with more favorable features: participant choice of selection and sequence of pieces, no curtain, some interpersonal interaction; (2) a closed audition with unfavorable features: no control or interaction and a curtain; and (3) a natural quartet performance in a relaxed setting (control or “baseline” condition). There was a 3-week interval between each pair of conditions. Generalized estimating equations were used to compare mean HR and HRV values between baseline and each audition condition and between the two baseline-adjusted auditions.

**Results:** Both audition conditions produced higher baseline-adjusted HR and lower baseline-adjusted HRV than natural performances. The unfavorable audition yielded stronger responses than the more favorable audition.

**Conclusions:** Closed auditions, with low participant control over features of the task and barriers to interpersonal interaction, resulted in stronger cardiac responses than more open, interactive

auditions. This has implications for the design of auditions to improve the hiring process for these jobs. The elimination of unnecessary and stress-invoking elements in the audition situation could reduce stress reactions in musicians and their risk for stress-related diseases, as well as potentially improve their audition performance. This study may serve as a basis for further investigations on the contribution of work environment factors to performance anxiety and stress response in performing musicians, as well as the quality of their performance.