PROCEEDINGS of the 2nd Symposium: The Acoustics of Ancient Theatres
6-8 July 2022 Verona, Italy

Room acoustic effects on singers voice parameters

Pasquale Bottalico[1]; Natalia Łastowiecka[2]; Silvia Murgia[2]; Joshua Glasner[3]; Yvonne Gonzales Redman[4]

[1] Department of Speech and Hearing Science, University of Illinois, Urbana-Champaign, United States of America, pb81@illinois.edu
[2] Department of Speech and Hearing Science, University of Illinois, Urbana-Champaign, United States of America
[3] Department of Music, Clarke University, Dubuque, United States of America
[4] School of Music, University of Illinois, Urbana-Champaign, United States of America

ABSTRACT

A classical singing performance of the same repertoire in different acoustic environments can exhibit adaptations. Changes in the singer's delivery may occur due to multiple factors related to the singer's perception of the acoustics within the performing venue and the measured parameters of the spaces. Voice production behaviors were evaluated to explore the effects of room acoustics on vibrato rate and extent, and on pitch inaccuracy. The subjects were nine classically-trained professional or semi-professional singers. Subjects sang the same aria in five different performance venues. The following acoustics parameters were measured in the five spaces: C50, EDT, IACC_late, and STv. It was observed that the vibrato extent was positively correlated with acoustic clarity and support, while it was negatively correlated with perceived reverberation and sound envelopment. Vibrato rate was negatively correlated with acoustic clarity and support, while it was positively correlated with perceived reverberation and sound envelopment. Finally, the pitch was more accurate in rooms with higher values of C80 and lower values of EDT. This finding indicates the importance of auditory feedback in singers' performance and the need for an acoustical design that takes into account the performers' needs.

10.58874/SAAT.2022.169