

“Singing in Different Performance Spaces: Room Acoustics Effects on Vibrato and Pitch Accuracy”

Bottalico, P., Łastowiecka, N., Glasner, J.D., & Redman, Y.G.

Abstract

Previous literature suggests that musical performers may be influenced to some extent by the acoustic environment. This study investigates the influence of room acoustics on vibrato rate, extent, and pitch inaccuracy by analyzing consecutive sung performances of classically trained students in five different performance spaces. Nine classically-trained student-singers performed the same aria unaccompanied on a variable starting pitch that was consistent between spaces. Variance in vibrato rate and pitch inaccuracy was primarily explained by individual differences between singers. Conversely, the variance attributable to the rooms for the parameter of vibrato extent was larger compared to the variance attributable to the performers. Vibrato extent tended to increase with room clarity (C80) and was inversely correlated with early decay time (EDT). Additionally, pitch inaccuracy showed a significant weak, positive correlation with EDT and significant weak, inverse correlation with room support (ST_v). Singers seem to adjust their vocal production when performing in different acoustic environments. Likewise, the degree to which a singer can hear him/herself on stage may influence pitch accuracy.

Key words:

Singing voice; Room acoustics; Pitch accuracy; Vibrato