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Symphony Orchestra Musicians: Reduction of Sound Exposure by Physical Measures

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ABSTRACT

Since most musicians are reluctant to wear hearing protection devices, physical measures are used in an attempt to control exposure levels in the orchestra. Examples of such measures are increased space between musicians, positioning brass instruments on risers, putting screens between musicians and adding sound absorption. The effectivity of such measures has been shown by the authors in JASA 142, 3154 (2017) and the published paper will be discussed in this presentation. It is difficult to exactly reproduce the music played by an orchestra under different conditions to determine the effect of measures. A solution to this problem was to simulate the effectivity of control measures using a prediction model. The model calculates the equivalent sound levels for a performance of the first 2 minutes of the 4th movement of Mahler's 1st symphony, representative for loud orchestral music. The model outcome shows good agreement with measurements of the same excerpt. Results show that physical measures are not effective enough to significantly reduce sound levels. It seems that musicians, playing current modern powerful instruments, have no other choice than to protect their ears with ear plugs under all circumstances if they wish to avoid the risk of developing hearing damage.

Keywords: Symphony Orchestra, Musicians, Sound Levels, Noise Exposure

1. INTRODUCTION

This presentation is based on a publish journal paper by the authors (1).

REFERENCES

1. Wenmaekers R, Nicolai B, Hornikx M, Kohlrausch A. Why orchestral musicians are bound to wear earplugs: About the ineffectiveness of physical measures to reduce sound exposure. The Journal of the Acoustical Society of America. 2017 Nov 21;142(5):3154-64.

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