

**EFFECT OF ENDPIN PADS
OF LOWER STRING INSTRUMENTS
ON THE AMPLITUDE OF VIBRATION
OF CONTACT SURFACES
AND THE PERCEPTION OF MUSICAL
PERFORMANCE**

By

Stephen L. Leiby

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Approved:

Jonas Braasch, Thesis Adviser

Rensselaer Polytechnic Institute
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ABSTRACT

It is common practice for cellists and double bass players to set the endpins of their instruments on pads either for traction or to reduce the risk of damaging the floor. The effects—if any—on aural and tactile perception of using such pads has never been explored in detail. Such effects could potentially have an impact on communication between musicians as well as the perception of the performance from the standpoint of the audience or nearby musicians.

This paper describes both the quantitative and qualitative effects of using an endpin pad. An experiment was devised to record the sound and vibrations of a cello using various endpin pads. The cello was recorded using a binaural dummy head and an accelerometer. A perceptual test was then devised and presented to several subjects in order to compare the recordings; the test was carried out using a motion platform and a pair of headphones.

It was found that using an endpin pad has varying effects on the vibrations, depending on the type of pad used. A rubber endpin tip provided the most damping, with bands around 3.5 dB. A wood endpin pad provided little damping and even increased the level of vibration in a few bands. There was an overall trend in the damping common to all the endpin pads. The influence of the pads on the vibration changed with the location of the cello, indicating the varying response of the floor has an effect on the influence of the pads.

Ten subjects were presented with two tests, each consisting of recordings from two different cellist locations relative to the recording position. The psychophysical test found that while subjects perceived differences in the vibration between recorded samples of different endpin pads, the evidence from their responses was mixed. Three different Kolmogorov-Smirnov tests were used to analyze the data. Several p-values for the subject response distributions fell below 0.05 for two of the tests, indicating that the differences were perceptible.