

Musicians' Perception of Melodic Intonation in Performances with and without Vibrato

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ABSTRACT

Background

Some musicians suggest that the use of vibrato masks intonation inconsistencies. A few studies support this proposition: listeners appear to require more time to determine pitch of tones with vibrato compared to non-vibrato, and the range of acceptable tuning appears to be greater for vibrato tones. Informal observation among musicians suggests also that some instruments are generally perceived as more out-of-tune than others, which may be related to the amount of vibrato used in common performance practice.

Aims

The present study compared music majors' discrimination of mistuned intervals in unaccompanied melodies performed by trumpet, violin, and voice. We also examined whether there were differences between the three timbres in melodies performed with and without vibrato.

Method

Participants were 144 music majors enrolled in one of three large university schools of music in the United States. We used recordings of a professional violinist, vocalist, and trumpet player playing the first four measures of *Twinkle, Twinkle Little Star*. Digital recordings were edited with software to provide the designated intonation conditions. Listeners heard a total of 18 examples: three unaccompanied solo performers (voice, violin, and trumpet) in two vibrato conditions (with and without vibrato), and three intonation conditions (melodic intervals were in-tune, sharp 25 cents, or flat 25 cents relative to equal temperament). The first measure was always in-tune. In examples with mistuned intervals, scale degrees 2, 5, or 6 were altered. Data consisted of listeners' intonation ratings of performances on a 7-point scale.

Results

All three stimuli were perceived as more out-of-tune when there was no vibrato compared to vibrato performances. Across stimuli without vibrato, violin was judged as more out-of-tune than voice and trumpet whether melodic intervals were in-tune, flat, or sharp. Melodies performed with vibrato were judged somewhat differently. Violin was judged as least in-tune for intervals mistuned in the flat direction, trumpet was heard as least in-tune for intervals mistuned sharp, and

voice was judged least in-tune when the intervals were actually in-tune (relative to equal temperament).

Conclusions

Music majors rated mistuned intervals as more in-tune when performers used vibrato. This provides additional support for the idea that vibrato helps mask intonation inaccuracies. There were differences in perception between timbres in the vibrato performances, and these perceptions may be influenced by typical performance tendencies of the instruments and voice or by the characteristics of the vibrato itself such as modulation width, rate, and type.

Keywords

Pitch Perception

Vibrato

Intonation

Music Performance