

# QUALITY ASSESSMENT OF MUSICAL INSTRUMENTS – EFFECTS OF MULTIMODALITY

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## Background

A musical instrument is a device for producing musical tones. Therefore engineers traditionally associate the quality of the musical instrument with the quality of the tones it produces. In turn, the quality of the tone is determined by its acoustical parameters. In this deterministic logic, it is quite possible to judge the quality of the instrument by the parameters of its tones, provided the relations between them are known.

The playing comfort and tone quality of a musical instrument from an engineering point of view are usually assigned to different design units of a musical instrument (e.g. key action vs. sound unit in pianos), therefore for instrument designers it is desirable to have musicians/experts separate the mechanical and acoustical quality.

## Aims

We want to show that this separation is not reliable under normal playing conditions due to psychological reasons. Practical ways of avoiding the problem are discussed.

## Main contribution

Experimental data presented suggest non-additiveness of the performer's impressions of the musical instrument quality obtained simultaneously over the auditory and kinaesthetic sensory channels. Cross-modal interference is a plausible explanation for why musicians confuse these impressions. Multimodal perception of a musical instrument by the performer and listener is analysed.

## Implications

- a) Improving procedures of quality assessment in the musical instrument industry;
- b) Solving on a psychological level the classical controversy between musicians and physicists of touch dependence of a piano tone.