

Verbal Descriptions of Musical Sound Timbre and Musician's opinion of their Usage

O. Moravec, J. Stepanek

Sound studio of the Faculty of Music, Academy of Performing Arts in Prague

Malostranske nam. 13, 118 00 Praha 1, Czech Republic, e-mail: moravec@hamu.cz, stepanek@hamu.cz

Introduction

Multidimensional nature of timbre was undoubtedly accepted by majority of researchers. The main interest is the question of existence and the search for common system of perceptual dimensions. This goal is filled in retrieval of salient dimensions or features of timbre on specific sound contexts. Perceptual space of sounds of studied context is constructed based on results of subjective statements. The interpretation of dimensions can be made using acoustic characteristics of sounds [1] or verbal attributes [2] or both. When using verbal attributes, the problem arises how to select representative, suitable and complete set of attributes according to tested sound context timbres. The experiment described in this paper was performed to discriminate verbal attributes according to rightfulness of their usage within specific sound contexts

Method

This experiment was preceded by 2 another experiments. In the first one a questionnaire survey was carried out to collect verbal attributes used by musicians for the description of timbre [3]. It results in common frequency vocabulary and group frequency vocabularies for respondent groups created according to which instrument respondent plays.

In the second experiment respondents have judged pair dissimilarities of verbal attributes according to the sound timbre which the attributes describe [4]. Fundamental result of this experiment is common perceptual space of verbal attributes. Main dimensions of this perceptual space are described by attributes:

1. temný / tmavý – jasný / světlý
(gloomy / dark – clear / bright in English)
2. drsný / hrubý – jemný
(harsh / rough – delicate)
3. plný / široký – úzký
full / wide – narrow.

In the experiment described in this paper respondents answered to six questions (Table 1) consecutively for each of sixty selected verbal attributes (25 verbal attributes most widely used in [3], rest of attributes was selected from frequency vocabulary based on another former experiments).

Judgment scales were quantified for processing of results and then basic statistical characteristics for each question and verbal attribute were calculated and compared: median, mean value, etc.

Results

Twenty experienced musicians took part in this test. Mean values of judgements were selected for the presentation of results which finely represent the differences in attribute judgements.

Mean values revealed that dimensional attributes *gloomy*, *dark*, *clear*, *harsh*, *rough*, *delicate*, *full*, *wide* and *narrow* found in previous experiment and attribute *sharp* are considered more then appropriate for the description of musical sound (question number two) and (except *rough*) are used more then often (question number one). Results for question number three are depicted in Figure 1, where the attributes are ranked by decreasing mean value and dimensional attributes and attribute *sharp* are displayed in colors. Mean values of answers to questions four to six for dimensional attributes and attribute *sharp* are summarized in Figure 2.

Discussion

Attribute *sharp* and dimensional attributes mentioned above showed to be appropriate and often used for the description of musical sound. This fact supports their importance among other studied attributes.

Attributes representing the third and first dimensions are more suitable for the description of steady state part of the sound (Figure 1), attribute *sharp* and attributes of the second dimension are suitable for both attack and steady state.

Suitability for the description of timbre of detached tone played on the instrument dominates for all attributes representing the first dimension (Figure 2) – we may call the **first dimension as timbre dimension**. Suitability for the description of technical quality of playing of tone together with artistic expression dominates for the **second dimension attributes** – we may call it as **dimension of playing quality and artistic expression**. Suitability for the description of timbre and technical quality of playing of the tone dominates for attributes of the third dimension – we may call the **third dimension as dimension of timbre and quality of play**.

Attribute *sharp* behaved similarly to attributes of dimensions one and three according to answers to questions four to six.

Acknowledgements

The research was supported partly by the Grant Agency of the Czech Republic (Project No. 202/02/1370) and partly by the Ministry of Education and Youth of the Czech Republic (Project No. 1M6138498401).

No.	Question	Judgment scale			
1	I use this attribute for musical sound description:	never	occasionally	often	very often
2	I consider it for musical sound description:	unappropriate	partly appropriate	appropriate	very appropriate
3	Attribute is suitable for description: - attack or steady state	rather attack		both	rather steady state
4	- timbre of detached tone of some instrument	unsuitable	adequate	very suitable	
5	- kind (quality) of play of tone played on some instrument	unsuitable	adequate	very suitable	
6	- artistic expression connected with musical performance	unsuitable	adequate	very suitable	

Table 1: Questions asked in experiment and judgement scales used in answers

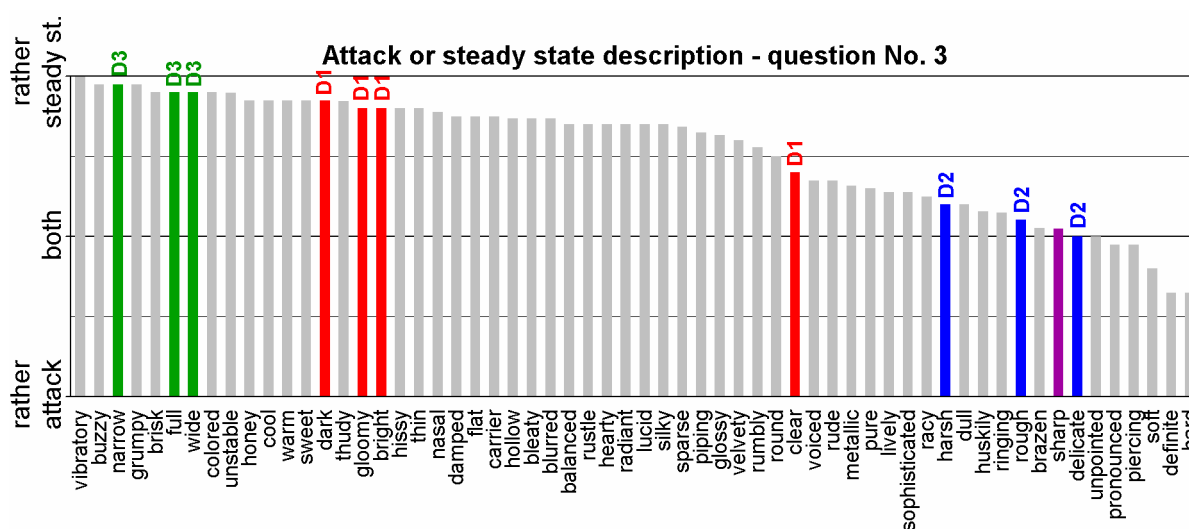


Figure 1: Mean values of answers to question three – suitability of the attribute for description of attack or steady state part of the tone. Values of dimensional attributes and attribute *sharp* are drawn in colors.

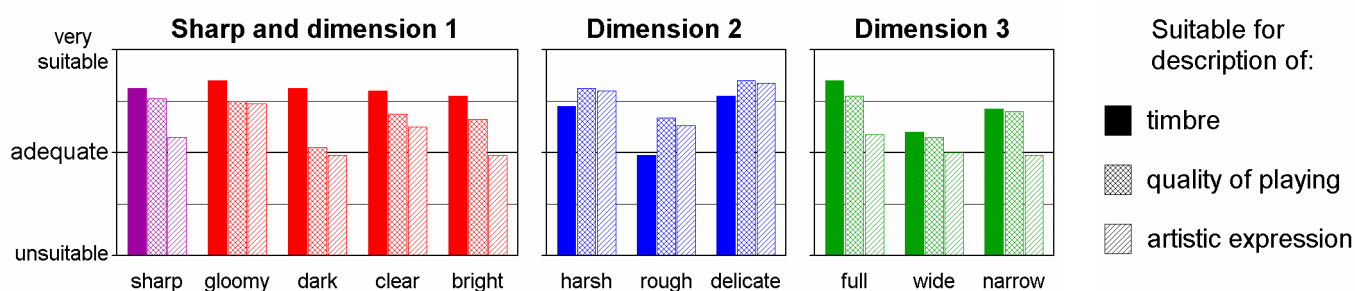


Figure 2: Mean values of answers to questions No. 4 to 6 for dimensional attributes and attribute *sharp*.

References

[1] Grey, J. M.: Multidimensional perceptual scaling of musical timbres. *Journal of the Acoustical Society of America* **61** (1977), 1270-1277.

[2] Bismarck, G. von: Timbre of steady sounds: A factorial investigation of its verbal attributes. *Acustica* **30** (1974), 146-159.

[3] Moravec, O., Stepanek, J.: Verbal description of musical sound timbre in Czech language. *Proceedings of the Stockholm Music Acoustics Conference (SMAC'03)*, Stockholm (2003), 643-645.

[4] Stepanek, J., Moravec, O.: Verbal description of musical sound timbre in Czech language and its relation to musicians profession and performance quality. *Proceedings of the Conference on Interdisciplinary Musicology (CIM05)*, Montréal (2005).