

Teachers' and Authors' Uses of Language to Describe Brass Tone Quality

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Teaching students to develop good tone quality is one of the most important goals of instrumental music teachers (Malave, 1990), but describing tone quality or timbre is often problematic. Tone color is an abstract, subjective, and somewhat illusive characteristic of playing a musical instrument (Johnson, 1981). The characteristic quality of an instrument, which enables the instrument to be identified, is usually described as timbre (Campbell & Greated, 1987). The American Standards Association (1951) defines timbre as “that attribute of auditory sensation in terms of which a listener can judge that two sounds, similarly presented and having the same loudness and pitch, are dissimilar” (p. 25).

Subtle qualitative judgments and physical adjustments are made routinely by musicians to manipulate the tone of an instrument into one that is valued and accepted as “good.” The term tone quality has been used by musicians for the purposes of describing: first, the tone production of an instrument and its nature or function; second, methods and mannerisms of individual performance, the control of the instrument by the player, or the function of the player; and third, certain conceptual and emotional values associated with musical expression (Stubbins, 1954). The smallest change in any component contributing to the creation of a tone on a wind instrument evokes a change in the relative strength and presence of the sounding partials, which results in a corresponding modification of the tonal timbre (Levarie & Levy, 1968). Music teachers have attempted to verbalize to their students about tone quality, and the language used by teachers to discuss tone quality is the focus of the present study.

Timbre has been more thoroughly investigated in an acoustical context than in a musical one. Helmholtz first investigated the parameters of timbre in 1862 and suggested that the quality of a musical tone was directly related to the number and relative intensity of the partials comprising the tone (Helmholtz, 1954). The role of the attack transient in perception of musical tone was also discussed by Helmholtz and more recently investigated by Thayer (1974). Several studies using multidimensional scaling to investigate timbre have indicated that timbre is a multidimensional attribute of sound and that the identification of timbre is closely bound to the spectral composition of sound (Kendall & Carterette, 1991; Malave, 1990).

The interrelationship between intonation and tone quality has been researched extensively (Geringer & Madsen, 1981, 1989; Spradling, 1985; Wapnick & Freeman, 1980). Ely (1992) and Jameson (1980) both concluded that timbre does not significantly affect musicians' ability to play in tune, but other researchers have found that musicians evince a preference for good intonation over good tone quality (Geringer & Madsen, 1989; Madsen & Geringer, 1976).

Research concerning the effects of timbre on intonational performance and perception has yielded conflicting results. Krumhansl and Iverson (1992) found that pitch and timbre were not perceived independently of each other, but Demany and Semal (1993) concluded that pitch and brightness of timbre were independent perceptual dimensions. Greer (1970) found a significant effect of timbre on brasswind performers' abilities to match the intonation of various stimuli. Jameson (1980), however, concluded that the effects of three contrasting trombone timbres on the pitch-matching abilities of high school, college, and professional trombone players had no significant effect on the pitch-matching scores across all three groups.

Several authors have investigated verbal descriptions of timbre (Abeles, 1978; Abeles & Hullum, 1982; Kendall & Carterette, 1993; Truax, 1972). The use of words to describe the quality of a particular tone is common in instrumental music pedagogy books, journal articles, and studies related to tone quality, but few researchers have studied the consistency of the adjectives used to describe the qualities of musical tones (Malave, 1990). Abeles (1978) explained that verbal descriptors are vague terms, meaning different things to different people, but musicians have relied on these descriptors (e.g., dark, round, thin) to label the qualities of tones. Musicians do use these terms with some measure of consistency. Abeles and Hullum (1982) state:

For musicians the development of "good" timbre is an important objective. Timbre instruction typically focuses on certain physical adjustments made by the performer as a result of verbal or musical (i.e., timbre) cues. Sophisticated performers must be able to alter the timbre they are producing at the command of the teacher or the conductor. This ability to translate certain verbal cues to the desired change probably results from an acquired consensus among musicians regarding the application of these timbre labels. (pp. 66)

The purposes of the present study were (1) to investigate the frequency and variety of verbal descriptors for timbre used by music instructors and cited in brass pedagogical literature and (2) to compare the pedagogical recommendations made by music instructors to recommendations that appear in the pedagogical literature.

Method

The participants were 32 middle school ($n = 16$) and high school ($n = 16$) band directors from 19 central Texas public schools. Each director was interviewed individually using a structured assessment interview. In this form of naturalistic inquiry, questions are decided in advance and are asked in the same way for all respondents. Each interview was audiotaped so that potential sources of bias could be controlled. The interviewer asked each participant the same initial questions and then extended the answers by restating the questions or by asking the teacher to elaborate on his or her responses. The initial questions were: (1) "When you teach brass players tone quality, do you have any particular method? (2) How do you describe good and poor sounds? (3) How do you talk about and teach tone quality to brass players?" Each audiotape was analyzed for content of verbal descriptors and pedagogical recommendations relating to timbre.

Other materials surveyed were 21 brass pedagogy texts. Included were 5 texts intended for use in college brass methods courses to prepare teachers of instrumental music and 3 texts aimed at brass performance in general. The remaining 13 texts focused on individual brass instrument performance techniques. Each text was analyzed for content relating to pedagogical recommendations concerning tone quality and verbal descriptors of timbre.

The content analysis of both the audiotapes and the texts focused on categorizing and listing the number of band directors or texts that discussed the behavior or descriptor rather than on the

frequency with which the term or behavior was described by each director or text. Results are reported as percentages of directors and texts that used each term.

Results

Table 1 presents comparisons of the observed percentages of verbal descriptors for good and poor tone quality used in both the audiotaped interviews and the brass pedagogy texts. The terms “dark” and “full” were used by over 30% of both band directors and texts to describe “good” tone quality. The term “centered” was used by 47% of the brass texts to describe a “good” sound. “Poor” tone quality was most consistently described with the terms “pinched,” “thin,” and “tight.” Band directors used a total of 50 different verbal descriptors for “good” tone quality and 62 different verbal descriptors for “poor” tone quality. The brass pedagogy texts used 45 verbal descriptors for “good” tone quality and 45 verbal descriptors for “poor” tone quality. A total of 71 different descriptors were used for “good” tone quality and 87 different descriptors were used to represent “poor” tone quality in both the interviews and the surveyed texts.

Table 1

Most Frequently Used Verbal Descriptors for Good and Bad Tone Quality and Percentages of Band Directors and Texts Using Each Term

Good Tone Descriptor	Band Director %	Brass Text %	Poor Tone Descriptor	Band Director %	Brass Text %
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full	34	38	mellow	12	23
centered	21	47	resonant	9	23
dark	31	33	warm	18	9
big	31	14	in tune	6	19
open	34	4	free	3	19
focused	18	23	brilliant	3	19
rich	25	20	has a core	6	14
beautiful	3	42	vibrant	12	4
clear	12	28	pretty	12	0
round	21	9			
pinched	50	14			
thin	28	38			
tight	40	19			
uncentered	15	19			
airy	18	9			
bright	18	9			
weak	15	9			
small	3	19			
muffled	3	14			
edgy	12	4			
fuzzy	12	4			
dull	0	19			
over-brilliant	0	19			
over-blown	9	4			
harsh	0	14			
hard	0	14			
closed	9	0			
spread	9	0			
too loud	9	0			

Pedagogical recommendations associated with “good” tone quality performance were also studied. These recommendations included techniques, exercises, and concepts that band directors and texts suggested for producing or teaching good tone quality. Responses overwhelmingly indicated breathing (or the use of air) as the most frequently cited factor involved in “good” tone production. Of the 32 band directors interviewed, 100% agreed that air was a key element of “good” tone. The size of the oral cavity was mentioned by 78% of the band directors and 76% of the brass pedagogy texts. Oral cavity, the openness of the throat, tongue position, and syllables were all included in this category. Embouchure was another

element that 85% of the texts and 37% of the band directors mentioned as important to good tone production. Articulation or the attack of the note was included in 80% of the texts, but only 12% of the band directors commented on this element of performance. Vibration of the lips, relaxation, mouthpiece placement, separation of the teeth, use of abdominal muscles, and moistening of the lips were all included as key elements of “good” tone production. A total of 23 responses from band directors and 33 from brass pedagogy texts were used in association with recommendations for achieving a “good” tone. A total of 27 common responses were found between the band directors and the texts.

Pedagogical recommendations for and behaviors associated with “poor” tone quality were also investigated. Band director interviews and texts each included 16 behaviors related to “poor” tone. Sixty-one percent of the brass pedagogy texts related excessive mouthpiece pressure to “poor” tone quality. Only 3 of the 32 band directors mentioned this element. Both band directors and texts indicated that excessive embouchure tension was related to “poor” tone quality. A stretched, smiling, thin, tight embouchure was described by 31% of the band directors and 23% of the texts as a contributing factor of poor tone quality. A closed throat or oral cavity was also cited by 37% of the band directors and 23% of the brass texts. Other behaviors frequently associated with “poor” tone were clenched teeth, puffing cheeks, lack of air support, harsh articulation, and tension in the body.

Most of the teachers interviewed (78%) indicated that some form of modeling was a necessary and important pedagogical tool for teaching a concept of sound or “good” tone quality. Five of the 32 band directors also described modeling “poor” tone for their students to allow them to discriminate between timbres. Teacher modeling was a recommended strategy by 65% of the band directors and 38% of the brass texts. Twenty-eight percent of the band directors and 19% of the texts suggested that students model for one another. Demonstrations by professionals or recordings were also highly recommended to serve as tone quality models.

Discussion

The results of this study indicate that a great variety of verbal descriptors are used to discuss tone quality, but relatively few of these are used consistently. It may be that the verbal descriptors that are used most frequently (i.e., pinched, thin, centered, full) are those that may be the most easily understood by the teachers and students who use them.

The results also indicate that modeling, breathing, embouchure, oral cavity, and articulation were included in band directors’ recommendations for teaching “good” tone production. Brass pedagogy texts cited excessive mouthpiece pressure as a detrimental behavior associated with “poor” tone quality, and band directors discussed the closed throat and oral cavity as elements of tone production associated with a “poor” sound.

Although musicians have recognized the difficulty in describing timbre, knowledge of the terms accepted in the pedagogical literature and used by music educators may have implications for future research in teaching tone quality. Knowledge of the common terminology and similarities among concepts used in established brass tone quality pedagogy may prove helpful to music educators.

This study sheds some light on the nature of the existing body of knowledge regarding brass tone quality pedagogy. Recommendations for future research include systematic observations of tone quality pedagogy in private music lessons and in ensemble rehearsals. Further investigation into the effects of verbal descriptors and modeling on timbre may be warranted.

References

- Abeles, H. (1978). Studies of the verbal descriptors of timbre. In E. P. Asmus (Ed.), *The psychology and acoustics of music : A collection of papers* (pp. 127-146). Lawrence, KS: University of Kansas.
- Abeles, H., & Hullum, J. (1982). The effect of verbal descriptions on clarinet tone quality. In P. E. Sink (Ed.), *Proceedings of the Research Symposium on the Psychology and Acoustics of Music 1981* (pp. 66-76). Lawrence, KS: Dept. of Art and Music Education.
- American Standards Association. (1951). *American standard acoustical terminology, Z24.1-1951*. New York: Author.
- Bellamah, J. (1976). *A survey of modern brass teaching philosophies*. San Antonio, TX: Southern Music.
- Berv, H. (1977). *A creative approach to the French Horn*. Bryn Mawr, PA: Theodore Presser.
- Brasch, H. (1971). *The euphonium and 4-valved brasses: An advanced tutor*. Unpublished manuscript.
- Brown, M. (1981). *Teaching the successful high school brass section*. West Nyack, NY: Parker Publishing.
- Campbell, M., & Greated, C. (1987). *The musician's guide to acoustics*. New York: Schirmer Books.
- Demany, L., & Semal, C. (1993). Pitch versus brightness of timbre: Detecting combined shifts in fundamental and formant frequency. *Music Perception, 11*, 1-14.
- Ely, M. (1992). Effects of timbre on college woodwind players' intonational performance and perception. *Journal of Research in Music Education, 40*, 158-167.
- Farkas, P. (1962). *The art of brass playing*. Bloomington, IN: Wind Music.
- Fink, R. (1977). *The trombonist's handbook: A complete guide to playing and teaching the trombone*. Athens, OH: Accura Music.
- Fox, F. (1974). *Essentials of brass playing*. Pittsburgh, PA: Volkwein Bros.
- Geringer, J. M., & Madsen, C. K. (1981). Verbal and operant discrimination—preference for tone quality and intonation. *Psychology of Music, 9*, 26-30.
- Geringer, J. M., & Madsen, C. K. (1989). Pitch and tone quality discrimination and preference: Evidence for a hierarchical model of musical elements. *Canadian Journal of Research in Music Education, 30*, 29-38.
- Goldman, E., & Smith, W. (Eds.). (1936). *Arban's complete conservatory method for trumpet*. New York: Carl Fischer.
- Greer, R. D. (1970). The effect of timbre on brass-wind intonation. In E. Gordon (Ed.), *Experimental research in the psychology of music* (pp. 65-94). Iowa City, IA: University of Iowa Press.
- Hanson, F. (1968). *Brass playing: Mechanism and technic*. New York: Carl Fischer.
- Helmholtz, H. von. (1954). *On the sensations of tone as a physiological basis for the theory of music, 1977*. Trans. By A. Ellis. New York: Dover.
- Hunt, N. (1984). *Guide to teaching brass* (3rd ed.). Dubuque, IA: Wm. C. Brown.
- Jameson, R. (1980). The effect of timbre conditions on the prompted and simultaneous pitch-matching of three ability groups of trombone performers. *Dissertation Abstracts International, 41*, 151A. (University Microfilms No. 80-15076).
- Johnson, K. (1981). *The art of trumpet playing*. Ames, IA: The Iowa State University Press.
- Kendall, R., & Carterette, E. (1993). Perceptual scaling of simultaneous wind instrument timbres. *Music Perception, 8*, 396-404.
- Kendall, R., & Carterette, E. (1993). Verbal attributes of simultaneous wind instrument timbres: I. von Bismark's adjectives. *Music Perception, 10*, 445-468.
- Knaub, D. (1977). *Trombone teaching techniques*. Fairport, NY: Rochester Music.
- Krumhansl, C., & Iverson, P. (1992). Perceptual interactions between musical pitch and timbre. *Journal of Experimental Psychology: Human Perception and Performance, 18*, 739-751.
- Levarie, S., & Levy, E. (1968). *Tone: A study in musical acoustics*. Kent, OH: The Kent State University Press.
- Madsen, C. K., & Geringer, J. M. (1976). Preferences for trumpet tone quality versus intonation. *Bulletin of the Council for Research in Music Education, 46*, 13-22.
- Malave, J. (1990). *A computer-assisted aural-visual approach to improve beginning student's clarinet tone quality*. Unpublished Doctoral Dissertation, The University of Texas at Austin.
- Powell, R. (1981). *Guide to trombone instruction: A text for the band director and the trombone student*. Unpublished manuscript.
- Schuller, G. (1992). *Horn technique* (2nd ed.). New York: Oxford University Press.
- Sherman, R. (1979). *The trumpeter's handbook*. Athens, OH: Accura Music.

- Spradling, R. (1985). Perception and preference of tone quality/intonation variables in flute/oboe duets by woodwind/brass performers. *Journal of Band Research, 20*, 27-39.
- Stubbins, W. (1954). The measurement of musical tone. *Journal of Research in Music Education, 2*, 135-145.
- Thayer, R. (1974). The effect of the attack transient on aural recognition of instrumental timbres. *Psychology of Music, 2*, 39-52.
- Truax, B. (1972). Development of a verbal technique for identifying children's musical concepts of instrumental timbre. *Dissertation Abstracts, 32*, 6482-A. (University Microfilms No. 7213945).
- Tuckwell, B. (1978). *Playing the horn*. London: Oxford University Press.
- Wapnick, J., & Freeman, P. (1980). Effects of dark-bright timbral variation on the perception of flatness and sharpness. *Journal of Research in Music Education, 28*, 176-184.
- Whitener, S. (1990). *A complete guide to brass instruments and pedagogy*. New York: Schirmer Books.
- Wick, D. (1971). *Trombone Technique*. London: Oxford University Press.
- Winslow, R., & Green, J. (1961). *Playing and teaching brass instruments*. Englewood Cliffs, NJ: Prentice-Hall.
- Winter, J. (1969). *The brass instruments: Performance and instructional techniques* (2nd ed.). Boston: Allyn and Bacon.
- Yancich, M. (1971). *A practical guide to French Horn playing*. Rochester, NY: Wind Music.