

WHAT CAN EXPRESSIVE PERFORMANCE STUDIES TELL US ABOUT THE ORGANIZATION OF MUSICAL MATERIALS

JOHANNA DEVANEY

DEVANEY@MUSIC.MCGILL.CA



CARL SEASHORE

- Seashore and colleagues at the University of Iowa (1936, 1938)
 - Parameters: timing, dynamics, intonation, vibrato
 - Subjects: pianists, violinists, singers
 - Expressivity in performances conveyed through deviations from a norm
- Timing deviations measured in relation to a metronome
- Dynamics measured in terms of relative loudness
- Intonation and vibrato measured in cycles per second



Source: www.acsu.buffalo.edu/~duchan/

TIMING AND DYNAMICS

- Piano performance is widely studied due in part to the
 - large amount of solo repertoire
 - existence of specially equipped pianos to measure performances
- Bengtsson and Gabrielsson (1980) undertook a number of experiments on musical rhythm in performance
- Todd (1985, 1989) studied both rubato and dynamics
- Clarke (1989) related rhythmic tendencies to the structural hierarchy of the piece and note-level expressive gestures
- Repp (1992) examined timing in piano performance and related it to phrase hierarchy
- Surveys available in Palmer (1997) & Gabrielsson (1999, 2003)



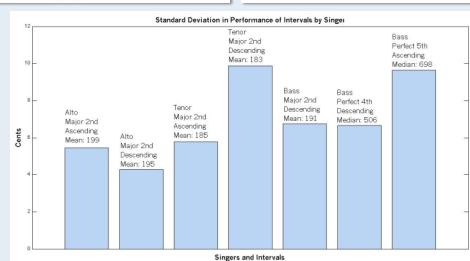
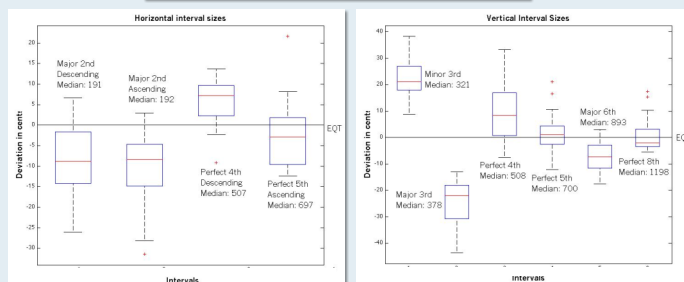
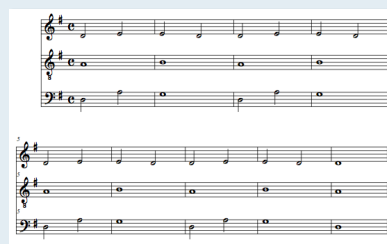
Bosendorfer SE piano, BRAMS

INTONATION

- Fyk (1995) studied intonation in solo violin and explored the relationship between intonation tendencies and gravitational attractions at work within the tonal system
- Jers and Ternstrom (2005) studied intonation and vibrato a 16-part choir in attempt to define "chorus-effect"
- Howard (2007a, 2007b) examined pitch drift and adherence to Equal Temperament or Just Intonation in an SATB quartet
- Timmers (2007) studied intonation in several Schubert songs and related the results to musical structure
- Ambrasevičius and Wiśniewska (2008) studied chromaticism and pitch inflection in traditional Lithuanian singing and derived rules to explain chromatic inflections for leading tones, and ascending and descending sequences
- Marinescu and Ramirez (2008) analyzed timing, dynamics, and intonation in excerpts from several arias performed by Jose Carreras and related the collected data to Narmour's implication-realization model (1990)

INTONATION IN VOCAL ENSEMBLES

- Experiment
 - 4 Professional singers (SATB)
 - 3 takes of 4 exercises sung to the syllable 'la'
 - Exercises were designed to explore opposition between vertical/horizontal tuning and pitch drift
- Each of the singers were close-miked and the recordings were analyzed using YIN, a fundamental frequency estimation algorithm (deCheveigne and Kawahara 2003)
 - The perceived pitch was assumed to be the mean of the frame-wise fundamental frequency estimates over the stable portion of the note (Brown and Vaughn 1996)
- Some preliminary results from Exercise 1



REFERENCES

- Ambrasevičius, R., and I. Wiśniewska. 2008. Chromaticisms or performance rules? Evidence from traditional singing. *Journal of Interdisciplinary Music Studies* 2 (1-2): 19-31.
- Bengtsson, I., and A. Gabrielsson. 1980. Methods for analyzing performance of musical rhythm. *Scandinavian Journal of Psychology* 21: 257-68.
- Bengtsson, I., and A. Gabrielsson. 1983. Analysis and synthesis of musical rhythm. *Studies of Musical Performance* 39: 27-60.
- Brown, J. C., and K. V. Vaughn. 1996. Pitch center of stringed instrument vibrato tones. *Journal of the Acoustical Society of America* 100 (3): 1728-35.
- Clarke, E. 1989. The perception of expressive timing in music. *Psychological Research* 51: 2-9.
- de Cheveigné, A., and H. Kawahara. 2002. Yin, a fundamental frequency estimator for speech and music. *Journal of the Acoustical Society of America* 111 (4): 1917-30.
- Devaney, J., and D. Ellis. 2008. An empirical approach to studying intonation tendencies in polyphonic vocal performances. *Journal of Interdisciplinary Music Studies* 2 (1-2): 141-56.
- Devaney, J., M. I. Mandel, and D. P. W. Ellis. 2009. Improving midi-audio alignment with acoustic features. In *Proceedings of the Workshop on Applications of Signal Processing to Audio and Acoustics*. 45-8.
- Fyk, J. 1995. *Melodic intonation: Psychoacoustics, and the violin*. Zielona Góra: Organon.
- Gabrielsson, A. 1999. The performance of music. In *The psychology of music*, edited by Deutsch, D. Second edition, San Diego, CA: Academic Press, 501-602.
- Gabrielsson, A. 2003. Music performance research at the millennium. *Psychology of music* 31: 221-72.
- Howard, D. M. 2007a. Equal or non-equal temperament in a cappella SATB singing. *Logopedics Phoniatrics Vocology* 32: 87-94.
- Howard, D. M. 2007b. Intonation drift in a capella soprano, alto, tenor, bass quartet singing with key modulation. *Journal of Voice* 21 (3): 300-15.
- Jers, H., and S. Ternstrom. 2005. Intonation analysis of a multi-channel choir recording. *TMH-QPSR* 47 (1): 1-6.
- Marinescu, M.-C., & Ramirez, R. . 2008. Expressive performance in the human tenor voice. In *Proceedings of the Sound and Music Computing Conference*.
- Narmour, E. 1990. *The analysis and cognition of basic musical structures*. Chicago, IL: University of Chicago Press.
- Seashore, C. 1936. *Objective analysis of musical performance*. Iowa City, IA: University of Iowa Press.
- Seashore, C. 1938. *Psychology of music*. Iowa City, IA: University of Iowa Press. Original edition, New York, NY: Dover Publications.
- Timmers, R. 2007. Vocal expression in recorded performances of Schubert songs. *Musica Scientiae* 11 (2): 237-68.
- Todd, N. 1985. A model of expressive timing in tonal music. *Music Perception* 31 (1): 33-58.
- Todd, N. 1989. The dynamics of dynamics: A model of musical expression. *Journal of the Acoustical Society of America* 91 (6): 3540-50.