"The 800-Pound Gorilla in the Rehearsal Room:
Nurturing Student Independence in Intonation"

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PART I CONCLUSIONS

• Advanced skills in intonation are teachable and learnable. As with most concepts, some students will embrace these skills more quickly than others…
• As with all important aspects of musicianship, the successful teaching of refined intonation skills requires continual attention - and repetition - throughout the learning experiences of students.
• The ultimate goal of teaching intonation skill is to foster skills that enable the accurate placement of every note, so as to never be out-of-tune. The internal instrument is the only way to properly place a note prior to its performance.
• Intonation training that solely teaches skills in “adjusting” (e.g. eliminate beats or waves) is – in one way - subconsciously encouraging error in the intonation aspect of instrumental music making.
• Intonation is ultimately the responsibility of the student musicians. The teaching of the skills to enable the musicians to be responsible for intonation is ultimately the responsibility of the educator.
• Western musical art traditions and practices require us to adhere to principles of just intonation in instrumental performance. In other words, performing with accurate intonation is not “optional.”
• Tone quality plays a critical role in intonation/tuning and, therefore, needs to be an aspect of music making that is continually reinforced by the teacher/conductor.
• 95% (+) of intonation skill is concentration. There is a strong correlation between an ensemble’s ability to concentrate and its consistency / success with intonation concepts.
• The “sense” of tonality is in the head of the musician – not in his/her instrument.

ABOUT SINGING …

• The use of singing to address intonation issues in the rehearsal setting is a long honored tradition in the wind band medium: “What can we do to improve the intonation of our individual players? … He must be made to sing, sing, sing. Tartini said, ‘Per be suonare, bisogna ben cantare! (To play well, you must sing well!).” --William Revelli, 1938.
• With the increased availability of personal audio devices (iPods, portable CD players, etc) fewer and fewer school-age students are experiencing singing as a way to enjoy / create music.
• The student comfort level with singing is directly proportional to the comfort level of the teacher with his/her singing voice.
• There is a connection between the sensation of creating musical sound with the voice and creating a musical sound in the mind. Both are highly individualized actions.
• There is something very powerful and deeply satisfying about using the voice – an instrument that is actually part of us as human beings – in making music.
• The quality of singing can serve as an indicator of the collective concentration level of an ensemble.
PART II  ACQUIRED SKILLS OF AN “INTONATIONALLY-INDEPENDENT” WIND INSTRUMENTALIST

PERFORMANCE SKILLS
1. Produce a consistent and characteristic tone quality (through all ranges and dynamic levels) from enunciation to silence.
2. Intentional and controlled manipulation of any/every note via embouchure or fingering so as to produce beatless or pure tonalities (e.g. unisons, octaves, fifths/fourths, thirds/sixths, and seconds/sevenths) as dictated by the tenets of just intonation.

PERCEPTION SKILLS
1. Advanced skill in inner hearing (e.g. the mind as a musical instrument).
2. A well-developed sense of tonality (residing in the head of the musician, not in the musical instrument) including skill in tonal memory.
3. A high sensitivity to beatless or pure tonalities.
4. Advanced skill in placing a pitch in the inner ear prior to producing it on a musical instrument.
5. Highly refined comparison skills between “the instrument in the head” and “the instrument in the hand.”

PART III  STRATEGIES TO DEVELOP SKILLS LEADING TO INTONATION INDEPENDENCE

PERFORMANCE SKILLS
1. Nurturing mature and characteristic tone quality
   a. Insist that every individual musician warms-up prior to the start of rehearsal. Students must be provided with toneful materials that are appropriate for use in this important part of their musical day (e.g. mouthpiece buzzing for brass instrumentalists, head joint tones for flautists, etc). Not only will then every student be charged with a task the moment that he/she enters the rehearsal room every day, the resulting tone quality of the ensemble will improve greatly. The key to success is for the teacher to be on hand to monitor this part of the rehearsal.
   b. Incorporate breathing exercises into the beginning of your rehearsals. The most common solution to improving tone quality is taking in a larger quantity and quality of air. For ideas on breathing exercises, seek out a VHS or DVD copy of The Breathing Gym by Sam Pilafian and Patrick Sheridan.
   c. Begin all rehearsals with sustained pitches in octaves, dictated by the conductor. Insist upon good posture, breathing, and blended tone qualities.
   d. Infuse every moment of every rehearsal with reminders of the importance of tone quality. As with all aspects of refined instrumental musicianship, tone quality has to be taught and nurtured continually.
   e. Insist on characteristic tone qualities from percussionists. Many times a slightly different implement will produce a very different tone. The bass drum is capable of a myriad of colors and timbres. Drawing the entire ensemble’s attention to that fact could be “ensemble changing” for many reasons.
   f. While admittedly overly simplified … Woodwind tone quality is most greatly influenced by the equipment that the students are playing (e.g. mouthpiece, reed, ligature, headjoint, bocal). Brass tone quality is most greatly influenced by embouchure (e.g. unimpeded buzzing aperture, minimal pressure, relaxed lip within the cup of the mouthpiece). Percussion tone quality is most greatly influenced by implement and technique (e.g. mallet choice, contact location on the bar/head).
g. Program and perform repertoire on every concert that explores lyrical, toneful playing. In order to keep percussionists engaged in the learning process, transcribe wind parts for mallet instruments (being sensitive to ranges – bells vs. xylophone vs. marimba). Lyrical and expressive music is one of the most direct ways to the souls of our students.

h. Advanced - Explore timbre matching within sections of the ensemble. There is good reason why every member of the Minnesota Orchestra horn section all perform on Lawson horns: the more that every member of a particular section sounds the same, the more clear and beautiful the resulting sonorities become. Isolate a section and have each member play the same musical pitch with his/her best tone quality. Ask the other members of the ensemble to explain how the sounds are different.

2. PITCH MANIPULATION
   a. “Pitch Bending Assignment” (see handout) – THIS IS HUGE! I cannot conceive of another way to ensure the ability to perform with accurate intonation according to the principles of just intonation without having every wind instrumentalist develop this skill. The time spent by the teacher hearing each individual student is a worthwhile investment of time and energy in the long run.
   b. A picture IS worth a thousand words! Copy and distribute the Chords of Just Intonation handout to demonstrate the importance of this skill with all of your wind instrumentalists.
   c. “Tuner Triads” – If you have access to three (or more) tuners that produce sounds, calibrate each to the same pitch standard, and set one on the root, another on the fifth, and the last on the third of the chord. Allow the students to hear the resulting beats or waves. Next, recalibrate the tuner dedicated to the fifth of the chord slightly higher (following the first chord on the Chords of Just Intonation handout). Allow the students to hear the beatless or pure interval that results. Next, recalibrate the tuner dedicated to the third of the chord, allowing the students to hear the resulting beatless and pure sonority.

HARMONIC/TRIADIC INTONATION
   d. “Tuning Trainer Assignment” (see handout) – This is the realistic and musical application of the pitch bending skill. Again, the time invested will pay large dividends.
   e. Harmonic Tuning (Instrumental application) – Acquire an ensemble technique or method book that provides traditional four-part chorales and/or sonorities. Isolate two, three, and then four part sonorities on a regular basis so that the ensemble can apply the Pitch Bending and Tuning Trainer skills to ensemble settings. Two outstanding resources for this aspect of teaching are James Ployhar’s Tone and Technique and David Newell’s Bach and Before for Band (see resources). Both provide chorales scored so that a teacher can quickly isolate soprano from alto from tenor from bass.
   f. Harmonic Tuning (vocal application) – Acquire resources that provides two, three and four part sonorities appropriate for singing in rehearsal. Experience has taught me time and time again that once an ensemble begins to sing in parts, the willingness of the students to embrace the strategy skyrockets. Two outstanding resources for this aspect of teaching are Alan Heim’s Band Tune-Ups and Stephen Melillo’s Function Chorales (see resources). Both provide tremendous flexibility, and can easily be used to play as well.

PERCEPTION SKILLS

1. INNER HEARING
   a. “The Good Voice in Your Head” – Ask the students to sing a familiar song (e.g. Happy Birthday) aloud, and then a second time but this time without actually singing aloud.
   b. “Inner Hearing in Color” – Ask the students to hear a familiar melody played on different instruments using their inner hearing (e.g. a short melody on flute; then the same melody on trombone; then on saxophone).
   c. “Écoutez et Répétez” – Using a familiar song, present one phrase to the students aloud, and have them sing the second phrase in their inner ear. For instance, teacher sings the first phrase of Frere
Jacques, and the students internally hear the second phrase. The teacher then sings the third phrase, and the students internally hear the fourth phrase.

2. TONALITY
   a. “Find the Clunker” – Perform a familiar melody either by voice or instrument, intentionally altering a single note sharp or flat. Ask the students to identify the improperly altered note. The goal is not to provide an incorrect pitch, but incorrect alteration of the correct pitch.
   b. “Cutting In and Out” – Have the students sing only certain words in a familiar melody. For instance, sing aloud only the word “you” when it appears in Happy Birthday.
   c. “Tennis Anyone?” – Divide the ensemble in half and sing a familiar song, alternating pitches between the halves. For instance, America, would be performed: (R) My (L) cout (R) try (L)’tis (R) of (L) thee, (R) sweet (L) land etc.
   d. “Four Square Anyone?” – (Variant of “Tennis Anyone?” above) Divide the ensemble into four groups and sing a familiar song, alternating pitches between each of the groups.
   e. “Play, then Sing” – Have the ensemble play the first three notes of a major scale, and then collectively have them sing the scale fragment back aloud.
   f. “Sing, then Play” – (variant of “Play, then Sing” above) Have the ensemble sing the first three notes of a major scale, and then collectively have them play the scale fragment.
   g. “I sing, you play” – The teacher sings a brief scale passage, to which the students respond on their instruments. The difficulty level of the passage can be adjusted to meet the skill level of the ensemble.

3. BEATLESS OR PURE TONALITIES
   a. “Electronic Tuner Duel” – Use two sound-producing electronic tuners, and calibrate one tuner slightly higher or lower than the other. Present the same musical pitch on both tuners, drawing the attention of the students to the resulting beats or waves. Then, recalibrate the tuners so that they are identical so that students can hear the resulting beatless or pure sonority.
   b. “Trombone Duel” – ( “Live” variant of “Electronic Tuner Duel” above) Using two trombonists, have them perform the same musical pitch and have one intentionally perform the pitch slightly higher or lower than the other, drawing the attention of the students to the resulting beats or waves. Then, have the “errant” trombonist adjust gradually so that students can hear the resulting beatless or pure sonority evolve.

4. PLACING A PITCH INTERNALLY
   a. “Find the Note in Your Mind” – Have the ensemble play the first note of a major scale. Next, instruct the students to sing up to the third note of the scale using their inner voice. Then, ask the class to sing that internalized note aloud.
   b. “Internal Melodic Intervals” – Using a numbering system in which 1 represents the first scale degree and 2 represents the second scale degree, etc., ask the students to internally hear the melodic interval “1, 4.” Then, have the class sing the melodic interval aloud.
   c. “It IS Polite to Point” – Using a familiar melody, have the students internally sing the song, singing aloud only when the teacher points to the class.

5. REFINED PITCH DISCRIMINATION SKILLS
   a. “Higher or Lower?” – The teacher presents two “versions” of the same musical pitch (singing, instrumentally, or recorded), intentionally altering the second note slightly higher or lower in musical pitch. Ask the students to identify whether the second pitch is higher or lower in musical pitch.
   b. “Student Version of Higher or Lower” – (variant of “Higher or Lower” above) Have two students perform the same musical pitch one after another. Ask the students whether the second instrumentalist is higher or lower in musical pitch.
PART IV RESOURCES


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CHORDS OF JUST INTONATION

While we ultimately address intonation by listening, rather than sight or mathematical formulas, sometimes it helps students to see exactly how much they need to adjust certain intervals in order to sound in tune. Some of the following information may be useful...

Maj

aug

dim (♭6)

min 7

min 7 (♯5)

Maj 7 (♯5)

7 (♭9)

min Maj 7

Maj 9

The modern equal temperament system divides the octave into twelve equal intervals, representing a compromise that makes intervals sound the same in every key. However, almost every interval is slightly (or significantly) out of tune when compared to just intonation, a tuning system in which intervals are based on mathematical whole-number ratios, resulting in pure harmonies without beats. Musicians must raise or lower certain intervals within chords in order to eliminate beats and achieve pure harmonies.
The Concordia Band
Dr. Scott A. Jones, conductor
“Pitch Bending” Assignment

The ability to intentionally manipulate any sounded musical tone is foundational to refined musical ensemble playing in the Western Art Music tradition. The tenets of Just Intonation require the manipulation of individual musical tones in order to achieve the “pure” or “beatless” sonorities that are the hallmarks of this particular tuning system. On the reverse is a chart that details how far sharp or flat (in “cents”) individual members of twenty commonly used chords in music composition must be altered to achieve these “pure” sonorities. As you will no doubt glean from study of the chart, without the ability to lower or raise any given musical tone, a musician lacks the ability to accurately play chords of any type “in tune” according to the laws of Just Intonation.

Outstanding professional musicians constantly manipulate the notes they play in an ensemble setting to accommodate the tenets of Just Intonation (in actuality, they accurately anticipate the manipulations prior to sounding the notes). Such adjustments are so fundamental, that for most well trained instrumentalists, adjusting pitch happens instinctually - almost subconsciously. The ability to play consistently “in tune” actually requires two separate but related skills - one of production (pitch production and manipulation), and another of perception (a refined sense of musical tonality and “inner hearing”). This exercise is focused exclusively on production skills.

While some adjustments for pitch can be made with alternate fingerings/positions, the majority of pitch manipulation must be made with the embouchure. To aid in the development in this important skill, the following exercise has been developed:

- Using a tuner, tune your instrument as you normally do, making any necessary adjustments to your tuning slide, barrel, head joint, etc. This is the only physical tuning adjustment you are to make to your instrument during the exercise.
- On a note of your choosing, play the note “in tune” (e.g. “0” on the tuner). Without stopping the sound, gradually manipulate the tone to “25 cents” flat. Hold the pitch there momentarily, and then manipulate it back to “0”. The entire trial (0 to -25 to 0) is to happen in one breath.
- Repeat the process, except this time manipulating the same tone to “15 cents” sharp, holding it momentarily, and then returning to “0”. Again, the entire trial (0 to +15 to 0) is to happen in one breath.

The goals of the exercise are as follows:

CONTROL – Rather than thinking of the “goal numbers” (-25 and +15) as being the most important goal of each trial, the ability to gradually control the movement of the pitch is far more important. Strive for steady and intentional control of the tuner needle as you manipulate the given note.

TONAL CONSISTENCY – As individual tones are manipulated flat and sharp, the quality of the musical tone must remain rich and mature. Focus your energies on performing an entire trial with no decrease in the quality of musical tone on your instrument. While somewhat counterintuitive, manipulating pitch in the flat direction most often requires an increase in airflow.

Section leaders will be evaluating this skill individually as part of your weekly scheduled sectional. It is imperative that every musician in the ensemble acquire and refine this particular skill. Questions should be directed to your section leader.

10/25/09
GOALS: 1) To become completely familiar with the sound of an in tune unison and octave.
2) To be able to internalize the unison or octave in so as to be able to perform the unison and octave in tune from the very beginning of its sound.
3) To be able to successfully demonstrate step 2 (above) for Dr. Jones.

MATERIALS: 1) Your instrument
2) Your portable digital tuner – calibrated to 440 (remember to check this!)
3) Your “Tuning Partner” CD
4) A stereo system with CD player
5) Your ears
6) Time and willingness to explore this important part of being an outstanding musician

PROCEDURE: 1) Warm up well, and use your portable tuner to check your tuning note. Make any adjustments to the length of your instrument at this time. THIS IS THE ONLY TIME THAT YOU SHOULD ADJUST THE OVERALL LENGTH OF YOUR INSTRUMENT DURING THE PROCEDURE.
2) Select a note on your instrument to use for the assignment, and sound that note on your instrument.
3) Select a track on the “Tuning Partner CD” that matches that note and sounds in the exact same octave as the note you have selected.
4) Adjust the volume of your stereo so that you can clearly hear the CD while playing your instrument.
5) Begin the selected track of the CD (each track lasts for 2 minutes).
6) With the CD playing and using your digital tuner, sound the note you have selected on your instrument.
7) Using the tuner, “pitch bend” the note until it is exactly in tune. Again, do not adjust the overall length of your instrument. Make all adjustments with your embouchure.
8) Listen very carefully to the resulting sound of the CD and your instrument sounding at the exact same frequency. The sound will be entirely free of “waves” or “beats.”
9) Memorize the resulting sound of being exactly “in tune.”
10) Repeat the above process, this time without looking at the tuner. Your ultimate goal should be to perform the note exactly in tune by simply listening to the sound of your instrument and the reference pitch. Make any adjustments (e.g. pitch bend) to remove any “waves” or “beats” in the sound.
11) Finally, repeat the procedure, again without the aid of the tuner, and this time strive to perform the note exactly in tune from its inception (e.g. without any needed adjustments). It will help greatly if you “hear” the note in your head clearly before playing it on your instrument. That process will aid your success in properly “placing the note” in tune from its inception.
12) Repeat the above process, playing one octave above the CD pitch. Again, make no adjustments to the length of your instrument. All adjustments should be with your embouchure.

EVALUATION: Schedule an appointment with Dr. Jones to perform a perfectly in tune unison and octave (step 11 above). You will be evaluated on how exactly “in tune” the note is from its very beginning. Sign-up sheets are posted on his studio door. Questions? Ask Dr. Jones.
Interval Tuning Assignment
Wind Ensemble
Winter Trimester 2003-04

1. Both players should schedule time together (approximately 30 minutes) to prepare these intervals. A quiet environment is essential to success with this exercise.
2. Both players determine a “tonic” pitch against which the intervals will be played.
3. Using a tuner, player 1 plays the tonic pitch. Once it is in tune according to the tuner, player 2 plays the first interval, adjusting the pitch of his/her instrument until the interval is “beat free.” All adjustments should be made with the embouchure and not the tuning mechanism.
4. Once success has been reached on the first interval, the same process is repeated for the remaining intervals in the exercise.
5. Once all intervals have been completed, players switch roles.

<table>
<thead>
<tr>
<th>Intervals to be performed (in the following order):</th>
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<tbody>
<tr>
<td><strong>Perfect Octave</strong></td>
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<tr>
<td><strong>Perfect 5(^{th})</strong></td>
</tr>
<tr>
<td><strong>Perfect 4(^{th})</strong></td>
</tr>
<tr>
<td><strong>Major 3(^{rd})</strong></td>
</tr>
</tbody>
</table>

6. Following the session together, both players should schedule a time to perform these intervals for Dr. Jones. Appointment times are available during lunch and after school.

This assignment is to be completed before the start of the holiday vacation (Friday 19 December 2003).