Vowel Modeling with the *Chiaroscuro* Whisper

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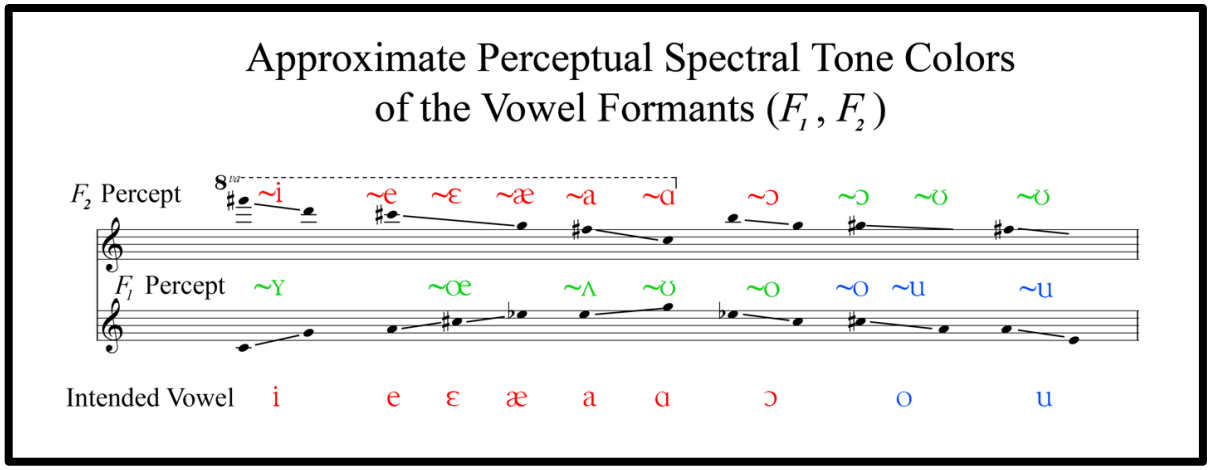
Vowels are composed of two vowel-like tone colors—the tone colors being featured by the first and second resonances of the vocal tract as the first and second formants. Playing with the percentages of those two colors and their perceived locations can lead to best resonance shaping as well as improved functional efficiency. Voicing is then motivated by the impulse to express a feeling, as well as the auditory targets made of these two vowel-like tone colors. In general, the target vowel guides vocal tract and mouth shaping, through which the complementary vowel is increasingly imagined with pitch ascent. Also, the brighter "over-vowel" is conceived as in the "back room" and the warmer "under-vowel" as out front. The over-vowel (f_{R2} or F_2) pitch of vowels can be rehearsed using the *chiaroscuro* whisper. When well-tuned, its bandwidth is sufficiently narrow to yield the clear auditory pitch targets listed below.

Intended Target Vowel	**Probable pitch of F_2 "over-vowel"**	**Complementary Vowel (allowed, not shaped) as perceived in context**	**The Literal Complementary Tone Color**	**Affective Motive**
Over-vowel as the bright target shape	**The pitch of F_2 dominates the whisper**	**Under-vowel** as the co-present, passive, warm, modifying complementary color	If **isolated** or heard spectrally as a single harmonic	**Possible Helpful Affects** (there are other options)
Tune this in the "back room"	The clearer the sense of pitch, the better tuned the resonance	Imagine this sound high & out front *without* shaping it as if it were the target vowel	The literal tone color of the harmonic(s) being featured by the first resonance	These affects help one to avoid excessive orality and sense pharyngeal locus
~ i	B6	~ ʏ	~ u	Skepticism
~ e	A6	~ ø	~ u-o	(what?!)
~ ɛ	G6	~ œ	~ o	possible acceptance
~ æ	F#6	~ œ	~ o	(hmm…maybe)
~ a	E6	~ ʌ	~ o	knowing agreement
~ ɑ	D6	~ ʌ-ɔ-ʊ	~ o	(duh, I knew that)
~ ɒ	C6	~ ʊ	~ o	Sweet empathy
~ ɔ	B5	~ ʊ	~ o	(aw, cute puppies)
Under-vowel as target shape; warm, close, in front		**Over-vowel** as passive, brightening complement; brightening, in "back room;" keep the "top corners" high with a pharyngeal grin.	The literal tone color of the harmonic(s) being featured by the second resonance	These affects tone, firm, and comfortably stabilize the pharynx across pitch change
Make this shape in front and as close as feasible		Imagine this brighter sound in a tall "back room," using an affect like amusement to tune and tone the pharynx		Keep the percept of front-to-back distance short.
~ o	A5	~ ʊ	~ ɔ	Amused agreement
~ u	G5	~ ʊ	~ ɔ-o	Flirting tease, mischief

Chiaroscuro Whisper Description

As a proponent of this training device, I can report that students have found it to be extremely helpful, both in freeing their production and in finding best resonance tuning, with the qualification that it needs to be done well, and takes some exploratory practice and judgment. When most useful, its characteristics include:



- a **comfortably low, clear, internalized pitch-centered noise** for F_2, but without resorting to pulling down or laryngeal depression--it should actually seem the easiest way possible to get an effortless low-pitched noise, feels unarticulated, very soft or neutral in the neck.
- a **specific pitch** set per vowel: /i e ɛ ɑ ɔ o u/-- B6 A6 G6 D6 B5 A5 G5 (for classical); B6 A#6 G#6 D#6 B5 A#5 G#5 (for brighter CCM genres)
- **minimal but sufficient articulation change** between vowels, almost like a ventriloquist, to achieve a bright, focused, pharyngeal orientation rather than a "spread" fore-mouth orientation
- then **moderately noisy** with gentle, easy airflow, not hollowed at all, so it is a clear, fronted depth, a bright low-pitched noise
- an **internalized, centralized turbulence sensation**, unlike in the typical whisper, which is more effortful, mouthier, and has a higher larynx and some throat constriction.
- use of some **internalizing affect** (naughty mischief; mildly concerned skepticism; disgust, distasteful scorn; warm empathy)
- **calming, soothing, sincere, internalized sensations**, as if reassuring yourself, not like you are broadcasting
- the more open the vowel type, the more you will notice the warming, neutralzing **complementary vowel color** as well as the target color. For example, when you go from /e to ɛ/, minimize opening the front of the mouth but continue to use expression. You will hear some passive (unshaped) /œ / warming the /ɛ/. And on /ɑ / you will notice some /ʌ-ʊ/ mixed in with the /ɑ/, keeping it lower and internalized rather than "spreading" it into the mouth.

***Chiaroscuro* Whisper YouTube Demonstrations**

Chiaroscuro Whisper Explanation & Demonstration (6 minutes, 47 sec)
https://www.youtube.com/watch?v=wrAreeFauok

Chiaroscuro Whisper Use for Active Vowel Modification (12 minutes)
https://youtu.be/9AO8XbgImCY

Chiaroscuro Whisper in a Treble Voice (32 sec)
https://www.youtube.com/watch?v=KVCbLzHWlXI

Unfiltered *Chiaroscuro* Whisper, by Ken Bozeman (Complete VV Whisper File; 9 sec)
https://www.youtube.com/watch?v=GAFSyjmR218

A *chiaroscuro* whisper filtered for the F1 "under-vowel" contribution, by Ken Bozeman (F1 filtered VV File; 9 sec)
https://www.youtube.com/watch?v=tSxmfDxPUlI

A *chiaroscuro* whisper filtered for the F2 "over-vowel" contribution, by Ken Bozeman (F2 filtered VV file; 9 sec)
https://www.youtube.com/watch?v=Df4NezmmdO8

Singer's formant cluster filtered from a *chiaroscuro* whisper, by Ken Bozeman (SFC filtered VV file; 9 sec)
https://www.youtube.com/watch?v=Uw1mIwpaNyk

The Challenge (a brightness bias and forward brightness percept)
Since we motor learned to whisper from childhood, retraining that coordination into this specialized *chiaroscuro* version takes some exploration and training. The typical whisper tends to have these characteristics:

- exaggeration of the higher end of the spectrum (high white noise content) in order to highlight the second formant "over-vowel" tone colors where most vowels target colors are located.
- Over-articulation of the target over-vowels
- Exaggerated percept of bright to the front, elimination of any darkness or depth
- A raised larynx and divergent, mouthy, "spread" resonator shape
- Turbulence felt out in the fore mouth
- Minimal to no under-vowel contribution

To overcome and retrain this behavior we need relax the neck and articulation system to facilitate an increase in lower frequency spectral content and use light affect to activate just enough articulation to retain high spectral content for a balance between the *chiaro* and the *oscuro* components, the over- and under-vowel contributions. The following tips may help in that exploration.

More Exploration Tips

- do nothing that doesn't feel good! This should feel easier and better than the typical whisper: comfortable, at ease, internalized, calm, soothing, settled, lower but *not* muscularly lowered larynx.
- sustain the *chiaroscuro* whisper *as if* inhaling, drawing air in, drinking the air, *not* as if blowing air out (imagined, not real—it is actually exhalatory, though ingressive whispering can be explored)
- seek a clearly tuned, tubular noise, like jug resonance, not a spread, mouthy noise
- merely think the intended vowels, don't feel yourself actively *do* them (in other words, hardly feel any movement from vowel to vowel
- use very minimal mouth opening, and then don't open further for the open vowels
- imagine you are furtively whispering code and don't want anyone to notice; like ventriloquism, except for the lip rounded vowels which need subtle help from the lips, but not jaw lowering
- in using affect, seek to use simple, naïve, uninhibited, child-like, unselfconscious affects; be creative, exploratory
- it must feel good, soothing, effortless, not at all pulled down in the neck, rather released, though internalized
- the turbulence will seem to be at or behind the dorsum/palatal narrowing and both above the palate (as if in the center of the head) and below the mouth (sternum), *not* out front in the fore mouth.
- the pitches will tune clearly; attempt to expressively audiate the *pitches* more than the target *vowels*
- learn to listen for the color of the complementary vowel along with each target vowel, but without shaping the complementary vowel as if it were the target vowel: expression and the target vowel guide the light shaping, the complementary vowel is passively built into a comfortably shaped target vowel
- seek to lightly release the tongue dorsum *up* & back, & the larynx down (no effort, merely imagined release)
- keep the sense of distance from front (lips) to back (throat wall) comfortably short—no yawn sensation.
- imagine the sensations below the larynx (sternum) and above the palate (center of the head) rather than feeling any of the oro-pharyngeal sensation of a yawn
- Use touch to orient the contrast: point at the lips for mouthy; put two fingers in the sternal notch and two fingers above the TMJ for chiaroscuro balance.
- explore contrasting short, gentle ingressive glottal clicks (strokes) with gentle egressive clicks—you may notice the under-vowel (first formant) pitch more with clicks. If sufficiently gentle, these clicks relax and soothe the vocal folds.
- remember, always use some light expressive affect along with the vowel's pitch target
- negative to positive practice: go from a higher-pitched, mouthy, fronted over-vowel low in the mouth to the lower, proper target pitch for the over-vowel felt more centrally and above the palate.
- Once properly and comfortably tuned, you should be able to move the head around without changing the F2 pitch percept to make sure there is no muscular articulatory bracing.