

Acoustic Vocal Pedagogy Workshop Self-Assessment Quiz

Please take this brief quiz on the fundamental terminology and concepts of acoustic vocal pedagogy (AVP). This is a self-assessment (answers start on page 8) to help you decide if you would benefit from the Bootcamp for Beginners: The Basics of Voice Acoustics. The bootcamp will be a hands-on, exploratory primer designed for those who are new to voice acoustics, those who would like a refresher, or those who would like new ideas about how to demonstrate the basics of voice acoustics to their own students. The material covered in this self-assessment is representative of what will be taught in the Bootcamp for Beginners: The Basics of Voice Acoustics sessions. If you would like to study, please read *Practical Vocal Acoustics* by Kenneth Bozeman.

- 1) In most speech and song, the human voice creates complex periodic sound. That complex periodic sound is comprised of:
 - a) placement
 - b) harmonics
 - c) one frequency without any additional frequencies or noise components
 - d) a pitch, which is the same thing as a frequency

- 2) Which harmonic has a frequency equivalent to the pitch of a musical tone?
 - a) first harmonic (H1 or f_0)
 - b) second harmonic (H2 or $2f_0$)
 - c) third harmonic (H3 or $3f_0$)
 - d) fourth harmonic (H4 or $4f_0$)

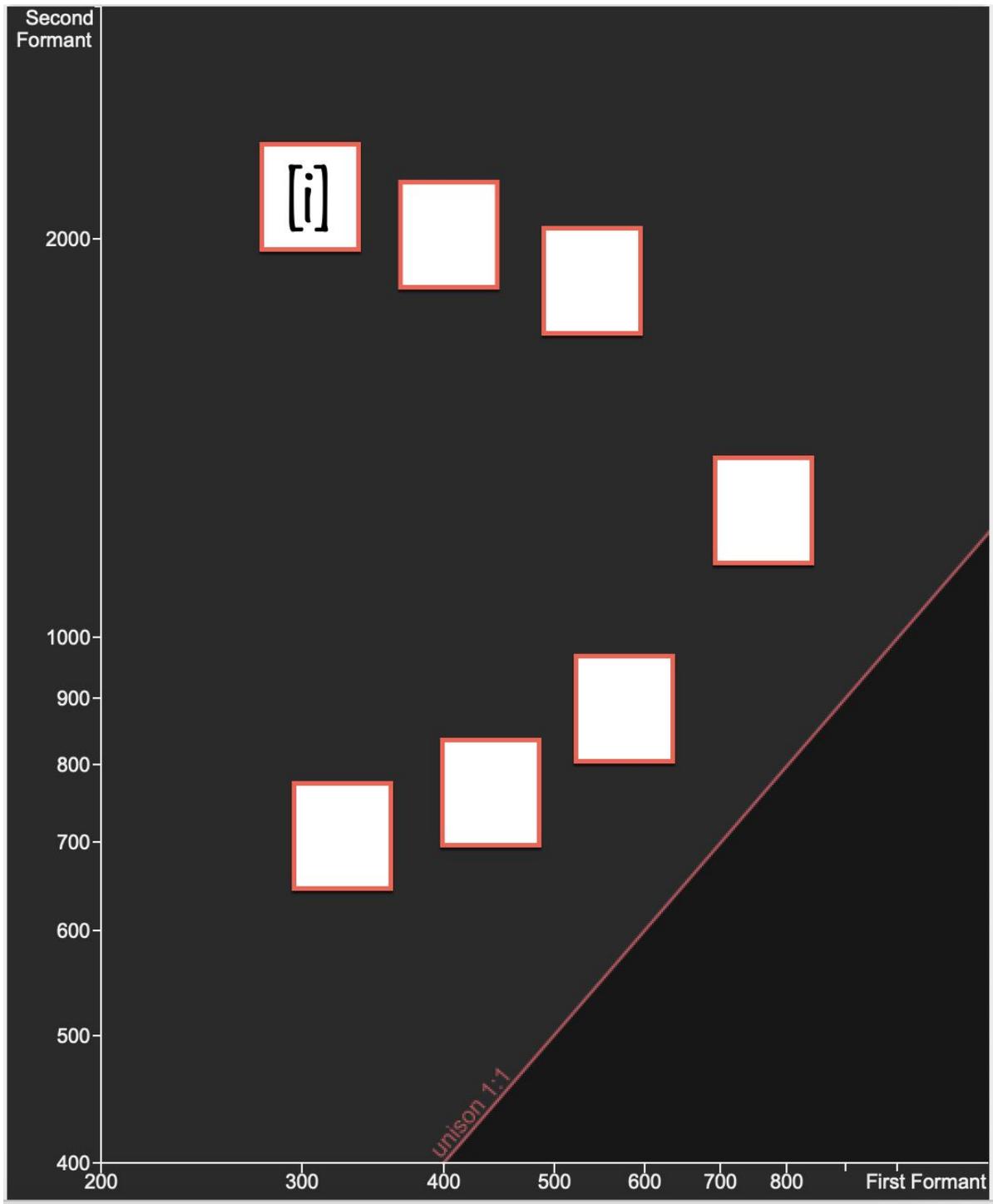
- 3) What is another name for this harmonic?
 - a) best harmonic
 - b) belting
 - c) fundamental frequency
 - d) vocal tract

- 4) If the musical note G1 has a frequency of 100 Hz, what are the frequencies for the following harmonics:
 - H1 (or f_0): _____
 - H2 (or $2f_0$): _____
 - H3 (or $3f_0$): _____
 - H4 (or $4f_0$): _____

- 5) Which two sets of muscles primarily control laryngeal registration?
 - a) Tongue and Lips
 - b) Sternocleidomastoid and masseter
 - c) The cricothyroids (CT) and the thyroarytenoids (TA)

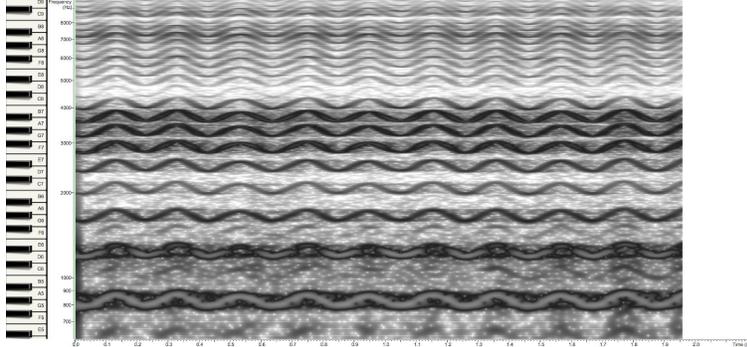
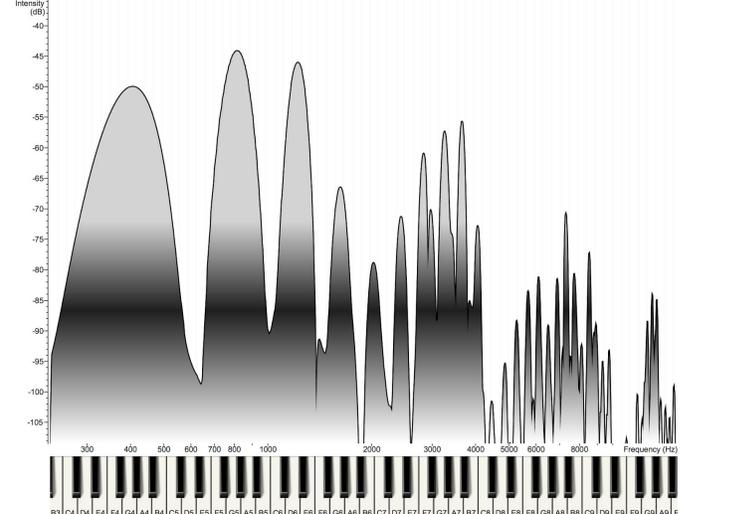
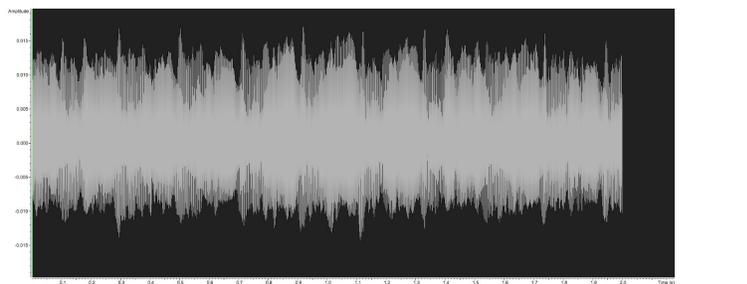
- d) Biceps and triceps
- 6) "Chest voice" and "head voice" are traditional terms used to describe which laryngeal modes (as the term mode is used by Heinrich, Titze, McCoy, Bozeman, and others).
 - a) Mode 1 and mode 2, respectively
 - b) On and off
 - c) pressed and breathy
 - d) acoustic registration
- 7) If the human voice is thought of as a source-filter model:
 - a) What is the source that creates the sound?
 - i) Articulators
 - ii) The phonating vocal folds
 - iii) Nasal resonance
 - iv) The mask
 - b) What is the filter?
 - i) Chiaroscuro
 - ii) The vocal tract
 - iii) The mask
 - iv) The rib cage
- 8) The human vocal tract is what kind of resonator?
 - a) A quarter-wave resonator
 - b) Optical resonator
 - c) Crab cavity
 - d) Microphone
- 9) The vocal tract is a resonator with multiple resonances. The resonances of the vocal tract can selectively amplify source harmonics. These strong harmonics create peaks in the complex sound wave. These peaks are called:
 - a) Harmonics
 - b) Chest voice
 - c) Formants
 - d) Articulators
- 10) The tendency of higher frequency source harmonics of a complex sound to drop off in power relative to lower frequency harmonics can be called the:
 - a) Spectral slope
 - b) Voice source
 - c) Resonator
 - d) Voce Vista
- 11) An F_1/F_2 plot graph is used to represent the frequency of which two formants? (Which are also known as the vowel formants)

12) On this F_1/F_2 plot graph, place the following vowels (IPA symbols for Italian vowels) into the appropriate boxes: [i] [e] [ɛ] [a] [ɔ] [o] [u]



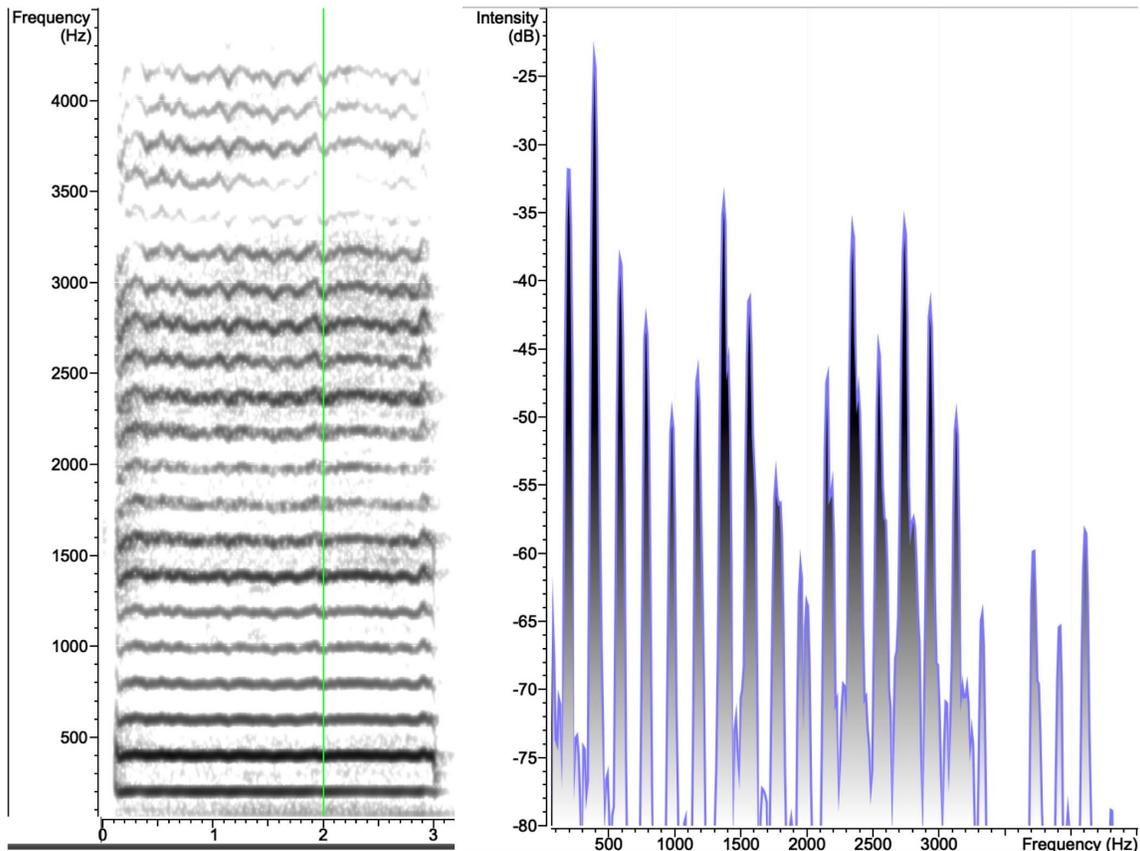
13) Sounds can be represented visually and analyzed with software like Voce Vista Video. Pair the following terms to the different displays available in Voce Vista Video:

- a) Spectrum
- b) Spectrogram
- c) Waveform

14) Identify and label the following elements in the display from Voce Vista Video:

- In the spectrogram, circle the fundamental frequency (f_0) and the 4th harmonic ($4f_0$)
- In the spectrum, circle and label the first formant (F_1), the second formant (F_2) and the Singer's Formant Cluster (SFC)



15) What causes acoustic registration events?

- Interactions between the source harmonics and the first formant (F_1)
- The Singer's Formant Cluster
- Chiaroscuro*
- Breathing

16) Which formant-harmonic tracking creates whoop coupling?

- 1st formant (F_1) tracking the 1st harmonic (f_0)
- 1st formant (F_1) tracking the 2nd harmonic ($2f_0$)
- 2nd formant (F_2) tracking the 3rd harmonic ($3f_0$)

- 17) Which formant-harmonic tracking creates yell coupling?
- a) 1st formant (F_1) tracking the 1st harmonic (f_0)
 - b) 1st formant (F_1) tracking the 2nd harmonic ($2f_0$)
 - c) 2nd formant (F_2) tracking the 3rd harmonic ($3f_0$)
- 18) Which acoustic events cause the opening and closing of timbre?
- a) The crossing of $2f_0$ above (closing) or below (opening) F_1
 - b) Chest voice and head voice
 - c) Flow phonation changing to pressed phonation
 - d) Inhaling and exhaling
- 19) When maintaining a stable resonator shape while changing pitches, the resulting change in vowel quality could be described as:
- a) Hooking
 - b) Belting
 - c) Active vowel modification
 - d) Passive modification or vowel migration
- 20) In Western classical singing, which formant-harmonic coupling should primarily be tracked by treble voices?
- a) First formant and first harmonic
 - b) $F_1:f_0$
 - c) Whoop timbre
 - d) All of the above
- 21) In Western classical singing, non-treble male voices must learn to avoid yell timbre when singing through and above the *zona di passaggio*. Acoustically, how is yell avoided?
- a) By allowing the second harmonic to pass above first formant
 - b) By allowing $2f_0$ to cross above F_1
 - c) Maintaining a stable vocal tract length and shape
 - d) Covering/turning over/closing
 - e) All of the above

ANSWER KEY FOLLOWS

Acoustic Vocal Pedagogy Workshop Self-Assessment Quiz

Use this answer key to grade your self-assessment quiz. **If you felt lost, missed more than a few questions, or the correct answers do not make sense, we would suggest that you register for the Bootcamp for Beginners: The Basics of Voice Acoustics.** This two day course can be taken on its own, but we would encourage you to take it ahead of, and also register for the main Acoustic Vocal Pedagogy workshop. This will give you the best chance to consolidate this important information before diving into faster paced practical applications. The Acoustic Vocal Pedagogy workshop will also offer ongoing review sessions to help you further consolidate what you learn.

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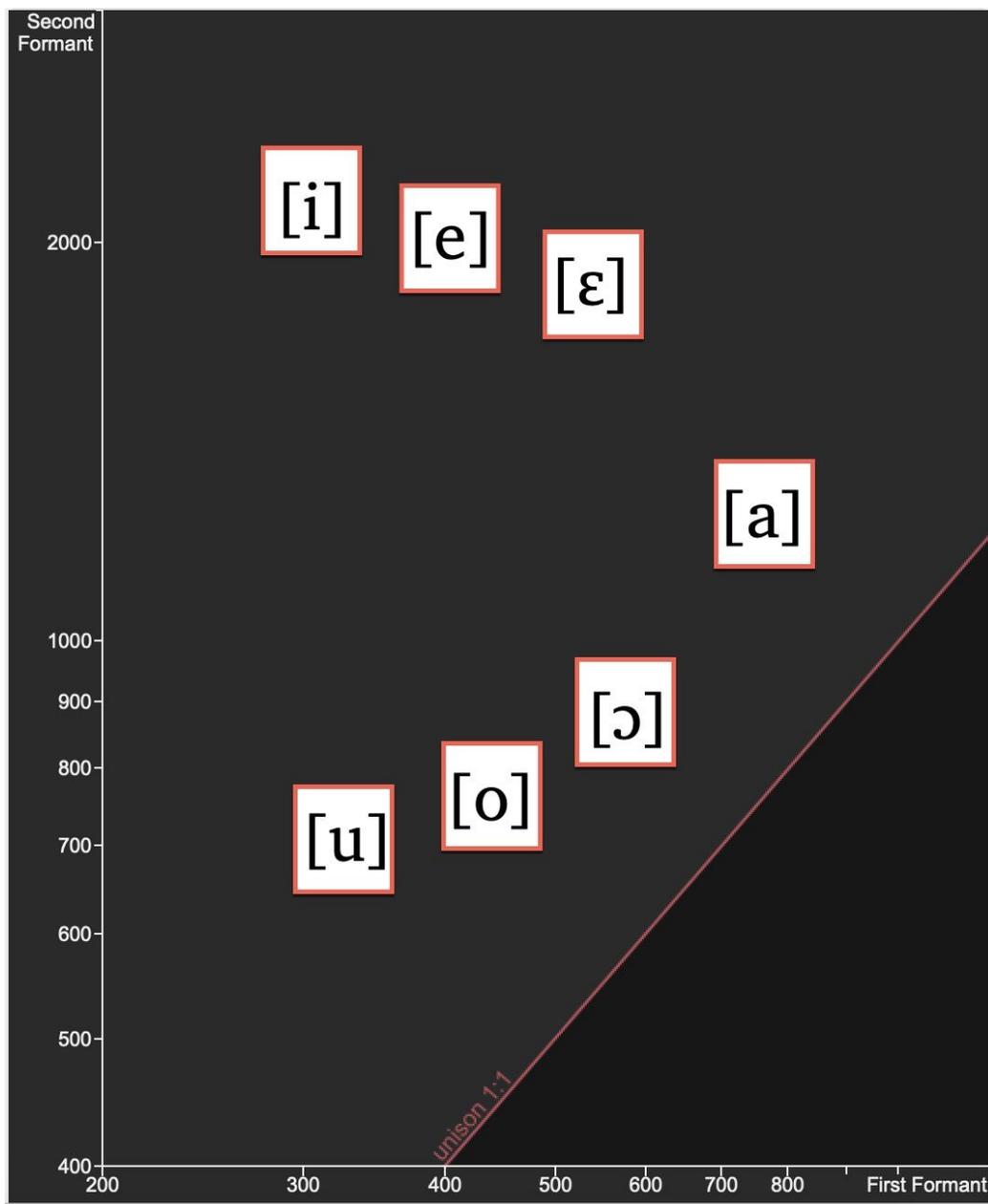
- 4) If the musical note G1 has a frequency of 100 Hz, what are the frequencies for the following harmonics:
 - H1 (or f_0): **100 Hz**
 - H2 (or $2f_0$): **200 Hz**
 - H3 (or $3f_0$): **300 Hz**
 - H4 (or $4f_0$): **400 Hz**

- 5) Which two sets of muscles primarily control laryngeal registration?
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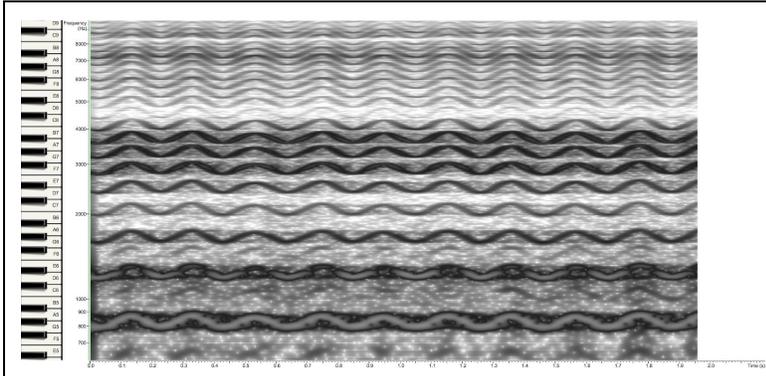
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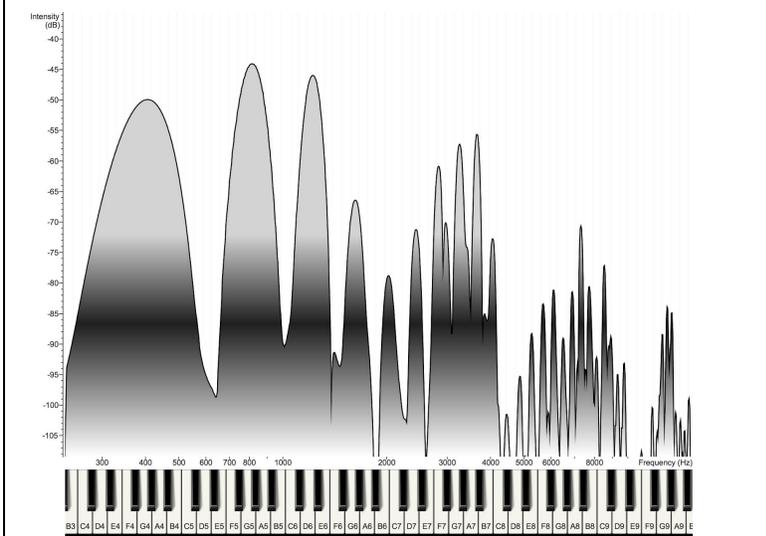
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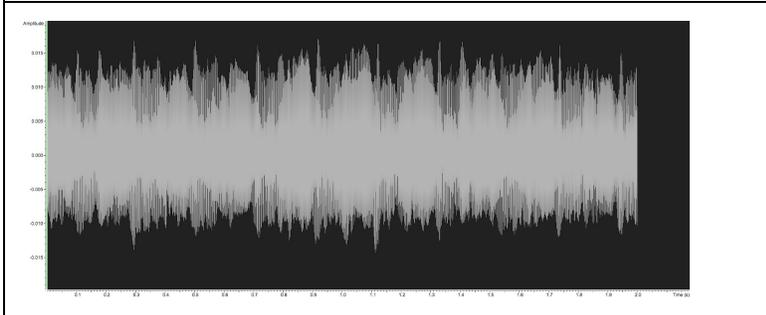
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Spectrogram



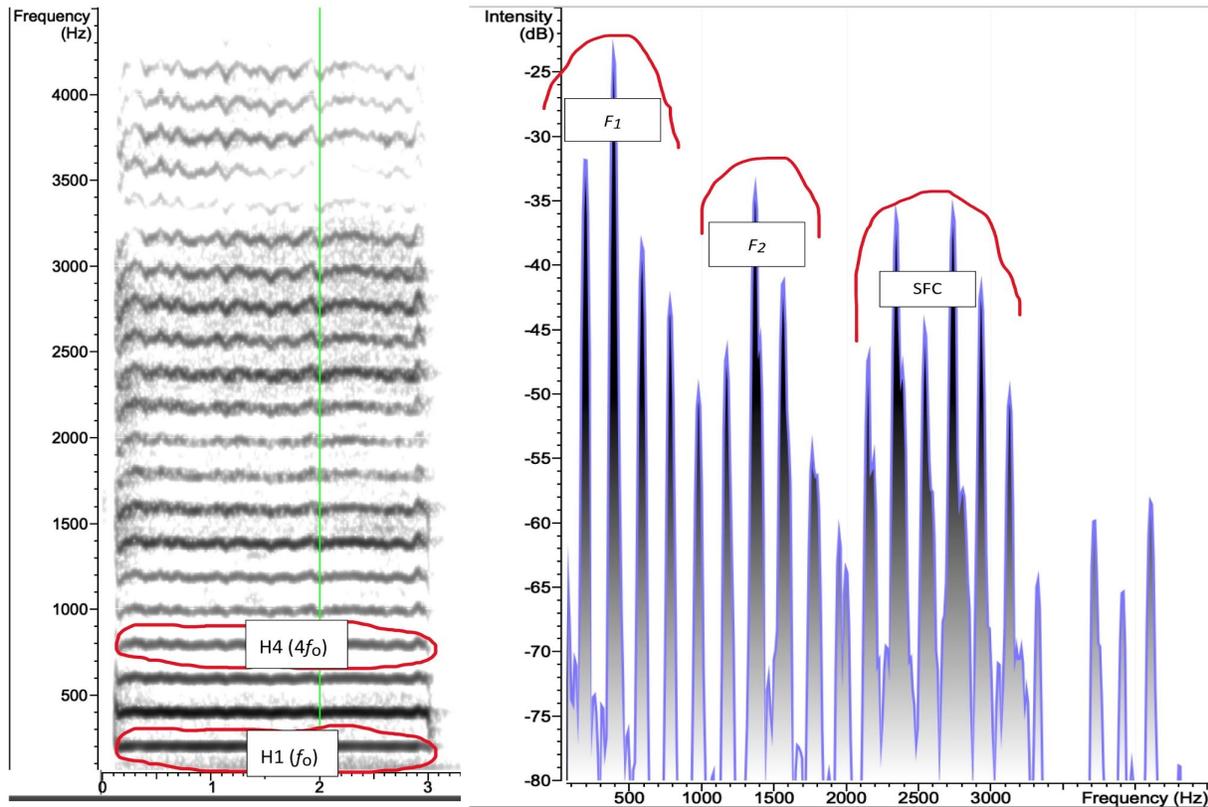
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Waveform

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