TransVoiceLessons Presents:

The Art of Voice Alteration Excerpt

By Zheanna Erose & Clover Grigsby

How to Use:

Listen critically to the audio files in this handout to build your aural recognition and awareness of the corresponding sound quality. The more you develop your ability to hear of these qualities, the easier they will be to control. Ear training is an essential part of vocal training. Developing a better ear for these qualities involves listening to the sounds, imagining the sounds in your head, describing the sounds to yourself, observing the ranges of each quality, and listening for the presence of the sound quality in voices.

After listening, do your best to follow along with the recordings. Take action and try to imitate and realize the sounds you hear. Reflect on the actions you take, how it sounds, how it's different than what you intended, and what you feel. Be mindful, present, patient, and interrogate your experience. Experiment and play freely without harsh judgement of yourself. Always try to learn from your experiments, even when your voice isn't behaving how you want. Observe if there is any strain or overexertion to release and relax between actions.

Have fun, hydrate and take frequent breaks. Avoid frustration and self doubt, as they only serve to undermine your growth. A positive, growth-oriented mindset is just as important as ear training, practice, and proper instruction. "Wrong" attempts are often rich with lessons. Think of "problems" as questions to ask yourself. Always be strategically lazy, and never chase a sound with effort or labor. Listen, mimic, process, reflect, and try again.

If the text or theory intimidates and overloads you, **focus on the experience**: explorations, hearing, and working towards imitating sound. Theory simply supports what we do by providing context and a framework to understand our actions on a higher level. An intellectual understanding is not responsible for driving the voice.

With love <3

Weight

The Spectral Slope

Overview

'Weight' is a perceptual sound quality that ranges from heavy to light. A heavier voice is also often perceived as buzzier, brassier, or more masculine, while a lighter voice is also often perceived as softer, flutier, or more feminine (see video). The sound quality of 'weight' is determined by the distribution of energy in the sound produced by the vibration of the vocal folds, also known as the *spectral slope*. Thicker vocal fold shapes produce heavier-sounding spectral slopes. Thinner vocal fold shapes produce lighter-sounding spectral slopes.

Weight directly influences the ease of different pitches. High pitches become more effortful with greater weight. Low pitches become more effortful with less weight. The lighter you are, the more speechlike high pitches become. The heavier you are, the more speechlike low pitches become. As weight changes, the functional pitch range changes. As such, pitch and weight should be considered together when exploring different vocal qualities.

Additionally, weight and pitch are connected to loudness. For example, if weight stays the same but pitch increases, loudness will increase. If pitch stays the same but weight increases, loudness will increase. Learning to discern and untangle these interconnected elements from each other is key. Namely, it is essential for avoiding common mistakes such as practicing too quietly or losing dynamic range while altering the speaking voice. Care should also be taken to avoid conflating weight with breathiness, which will be discussed in the chapter on purity.

Our goals with weight include improving our ability to recognize and control it and developing an understanding of its relationship to other voice qualities. To do this, we will listen to multiple examples of variation in weight, explore increasing and decreasing weight in our own voices, and explore how other voice qualities might shift in response to changes in weight. Below are several explorations of weight to work with:

Hearing and Exploring

Listening for Weight:

These files will demonstrate the sound of weight. You may hear the heavier examples as full, buzzy, and more intense while hearing the lighter examples as less full, smoother, and more gentle.

1. Hearing Heaviness
2. Hearing Lightness
3. Contrasting Weight
4. Influence on Gender Perception

1. Light Weight & Low Pitch
2. Heavy Weight & High Pitch
3. Examples in singing
4. YouTube Video on Weight

Discriminating Weight from Loudness:

Weight plays a crucial element in altering the perception of loudness but when we are training recognition and control of weight, **we must hear it as separate from loudness.** The examples below illustrate the sound of weight changing while staying the same volume:

- Weight Shifting - Same Loudness
- Weight Gradually Increasing - Same Loudness
- Weight Contrasts - Same Loudness
- Weight Contrasts - Singing - Same Loudness

Weight & Pitch Basic Exercises:

Understanding the relationship between weight and pitch is very important. It is much more difficult to raise the pitch of your voice with a heavier weight due to the thicker vocal fold shape. Inversely, lighter weights (which involve a thinner vocal fold shape) cause higher pitches to become easier to produce. Because of this, exploring weight and pitch at the same time is one of the best ways to gain awareness and control of weight. Here are several valuable explorations of weight and pitch together.

Humming

1. Heavy Up
2. Heavy Up to Light
3. Light Down
4. Light Down to Heavy

Singing

1. Heavy Up
2. Heavy Up to Light
3. Light Down
4. Light Down to Heavy

Accessory Weight Exercises:

Below are several different exploratory approaches to further experiment with weight. There is something to learn from all of these!

Single Pitch

1. Heavy to Light - Single Pitch
2. Light to Heavy - Single Pitch
3. Back and Forth - Single Pitch

Creak

1. Light Creak to Heavy Creak
2. Heavy Creak to Light Creak
3. Creak to Light
4. Creak to Heavy
5. Light down to Light Creak
6. Heavy down to Heavy Creak

Extended

1. Laddering Up
2. Light Up to Lighter
3. Heavy Up and Light Down
4. Light Taps and Heavy Taps

Discriminating Weight from Breathiness:

One of the most common misinterpretations of lighter vocal weight is added breathiness. Breathiness muffles the buzzing sound of weight under a hushed stream of noise. Ensure that as you practice control of weight, you avoid adding breathinness. The files below illustrate breathiness vs lightness. Additionally, the last file is a 10 minute long video discussing breathiness vs lightness.

- Breathiness vs Lightness quick example
- Video Lecture on the Topic

Implementing Different Weight in speech:

In this section we will explore a handful of approaches to implement different weight in speech. These exercises are simple models. The best results will come from organically experimenting with implementation.

1. Basic Vocal Movements While Maintaining Weight
2. Working into Speech Through Sustained Weight
3. Choosing Weight and Counting
4. Laddering up in weight with a word

Common Problems:

- Conflating less weight with breathiness
- Difficulty leaving comfort zone
- Confusion with falsetto
- Applying too much effort / strain to be thin

Theory

Considerations for Weight:

Weight can impact the effort required to produce different pitches—more weight can make reaching higher pitches feel challenging and effortful, while less weight can help make higher pitches achievable with much less effort. Taking lighter sounds to lower pitches can require more finesse. Heavier sounds also tend to be louder than lighter sounds at similar pitches. Vocal weight has a direct influence on vocal range.

Weight, pitch, and loudness are all inextricably connected. When one changes, at least one of the other two qualities will likely change with it. Here are some of the main relationships that are evident:

- If you keep weight the same, an increase in pitch will result in an increase in loudness.
- If you keep pitch the same, an increase in weight will result in an increase in loudness.
- If you keep loudness the same, an increase in pitch will result in a decrease in weight.
- Lighter weight moving to a lower pitch decreases in loudness

Becoming aware of these general relationships between weight, pitch, and loudness provides a foundation for sound production. The stronger and more flexible our foundation is, the easier it will be to modify the speaking voice into the desired form.

Very heavy sounds can be overly taxing on the tissue of the vocal folds. Care should be taken to avoid abusing these extremely heavy weights so that the vocal folds do not sustain injury. Uncontrolled heaviness at higher pitch should also be avoided outside of controlled exploration. In regular day to day speech, weight fluctuates depending on the speaker's emotional state, the context of the conversation, and other factors.

Individuals may find it challenging to maintain a new chosen vocal weight. This challenge is totally normal and expected. To help remedy this, consider slowly increasing the complexity of action with new vocal weight. For example, one can start with just individual tones while trying to preserve a new weight then gently progress to small movements of pitch, then work on speaking a few words, and ultimately progress to fluid speech. Incremental steps nurture behavioral patterns to form more readily.

Some people, especially those with singing backgrounds, may recognize weight as a key quality for vocal registration. Weight contributes heavily to the perception of what register a voice is produced in. A typical degree of weight in a speech range will produce a sound quality known as *modal voice* or *chest voice.* Reducing weight past a point will result in the voice producing a sound quality known as *falsetto* or *head voice*. At more extreme pitch ranges, heavier sounds are often described as calling, yelling, or belting, with lighter sounds often described as whooping, screaming or even whistling.

Sex and Gender Differences in Weight:

Androgenized vocal folds are longer, thicker in shape than non-androgenized vocal folds. This extra vocal fold mass influences the way the voice as an instrument intersects with pitch, weight, and loudness. Additionally, social norms firmly encourage AMAB and AFAB individuals to acquire behavioral patterns which emphasize and bring out the potential effects of greater/lesser vocal fold mass. The developmental thickening of the vocal fold tissue from androgens in conjunction with conditioned behaviors leads to average “male” voices and “female” voices presenting with distinctly different vocal weight and pitch patterns. Control of vocal weight allows an individual to override these developmental and social influences.

Weight is one of the most noticeable self reported vocal elements to individuals struggling with vocal dysphoria. Transfeminine individuals are often acutely aware of the pitch difficulties and buzzy quality created by increased weight. Transmasculine individuals are often acutely aware of the lightness and difficulty in reaching lower pitches with power. Vocal weight is at the heart of these respective challenges.

For voice feminization:

Reduction of weight is a key skill to develop. Reduction of weight liberates the voice to reach and sustain higher pitches more comfortably. When excess weight is carried higher, more tension is required of the vocal folds to produce and sustain the desired pitch. The lighter a voice is, the less physical tension is necessary to exist within the average "female" pitch area (150-300 Hz roughly). In addition, greater weight produces a distinct buzzing quality. The buzzy-ness and subsequent forceful sound at higher pitches is an auditory cue for exposure to androgens.

Weight control grants the user the ability to remove auditory effects of androgen exposure. By reducing weight, higher pitches become more speechlike, lower pitches become more distant, dense buzz is thinned to a lighter sound, and pitch mobility increases. This process should be thought of as core to voice alteration. Regardless if a student seeks a heavier or lighter feminine voice, the weight and pitch relationship is crucial to learn. In many cases, adequate reduction of weight and relaxed speech alone can push a voice into being perceived as "female".

Lighter vocal weight tends to break up into creakiness, breathiness, or gets quieter as it progresses to lower pitches. This "struggle" to produce lower pitch is characteristically feminine. For voices seeking a more butch or feminine androgynous sound, increasing weight within a lighter overall range is desired. Regardless of developmental or behavioral history, voices regularly fluctuate in weight depending on loudness, pitch, emotional state, and many other moving variables. Long term, we are trying to alter the *range* our weight behaviors occur in rather than staying at exactly one unwavering weight. In the short term though, experimenting with new types of weight/pitch while maintaining the sound in speech is necessary to nurture control to allow for long term optimization.

Weight in feminization can be summarized as: be lighter, go higher, and gain fluidity.

For voice masculinization:

Weight control is a primary element of masculinization. Addition of weight liberates the voice to reach and sustain lower pitches more comfortably and characteristically masculine. Greater weight produces a distinct buzzing quality. The buzzy-ness and subsequent forceful sound at higher pitches is an auditory cue for exposure to androgens. For transmasculine voices on testosterone, thickening and lengthening of the vocal folds is expected. However, pre-t or non-t transmasculine voices can still achieve great effect through controlling vocal weight to suit their needs. Regardless of your hormonal status, increased control over heaviness should be thought of as a core to voice masculinization.

Weight control grants the user the ability to add auditory effects of androgen exposure. By increasing weight, lower pitches become more powerful, intense, and active whilst higher pitches become more characteristically effortful as expected of masculine voices. Additionally the buzzing quality of weight is a key characteristic of "male" average speaking voices. The masculinizing buzzy quality emerges in the voice through increasing weight.

Pitch and weight are the most important elements for transmasculine voices to consider. Often it is difficult for transmasculine voices to extend pitch down below 150 Hz without significant weight training. The average "male" speaking pitch tends to sit around ~125 Hz for reference.

In summary, transmasculine voices will gain three primary benefits from increasing weight.

1) Characteristic masculine buzz associated with density of sound
2) Access to low pitches
3) Effortful higher pitches which are more akin to how average "male" behave

Weight in masculinization can be summarized as: be heavier, go lower, and gain sustainability.

For voice androgyny:

Here are a few core ideas of weight for the androgynous voice:

1) the voice user can adjust the voice to an androgynous pitch area (135-175) and maintain a neutral weight
2) fluctuate weight freely,
3) choose a "male" or "female" typical weight/pitch while stacking elements which suggest the opposite characteristic of the chosen weight.

There are numerous additional pathways for androgyny but they typically either involve equally using masculine and feminine cues, stacking opposite cues, or carefully treading the middle ground between average values for the masculine and feminine bimodal distribution.

Balancing in the middle creates a dramatic effect of vocal androgyny but at the expense of narrowing the range. This often creates the most genuinely androgynous voices that tend to avoid getting gendered or sexed by a casual listener.

A different approach can come in the form of gender disruption. This is the process of intentionally choosing a conventional masculine or feminine trait then stacking the rest of the voice with opposing gender cues. This disarms the ear from being able to confidently gender the sound. An example would be heavy weight + feminine resonance or light weight + low pitch.

Additionally, genderfluid, agender, bigender, or plural individuals may find it most appropriate to fluctuate freely in weight depending on the desired expression in the moment. This creates androgyny through inconsistency but tends to still get gendered one way or another by casual listeners depending on the relative balance between masculine, feminine, and androgynous features.

Acoustic Principles of Weight:

The majority of pitched sounds, including voice, are composed of a series of frequencies (harmonics) which are perceived together as one individual gestalt-like sound (video illustration). These harmonics naturally become progressively quieter the higher they go. The change in amplitude of each successive harmonic is the **spectral rolloff** or **spectral tilt**. When the spectral rolloff is steep, sounds become flute-like, mellow, smooth, light, and less intense. When the spectral rolloff is shallow or flat, sounds become metallic, buzzy, dense, and more intense (see image 1).

Heaviness is driven by thicker vocal fold shapes which recruit more vocal fold tissue to actively vibrate. This in turn boosts the amplitude of higher harmonics (especially between 2.4k-5kHz) causing the signature perceptual effect of a buzzy and denser sound. Lighter vocal qualities are driven by thinner vocal fold shapes which disengage more of the vocal fold tissue and subsequently steepen the decay of higher harmonics. As the vocal weight changes, the harmonic spectrum of the voice changes (see video) (see image 2).

Heaviness demands more effort and force as pitch rises due to the relationship between mass, tension, and speed. Objects with greater mass require more energy and/or tension to vibrate at increasingly higher frequencies than a similar object with less mass climbing by the same frequency amount. By reducing the weight of the vocal folds, mass is decreased which frees the tissue to vibrate faster while decreasing intensity. And by contrast, greater mass facilitates voices in reaching lower pitches.

Students can explore this relationship of mass, tension, frequency, and energy requirement by imagining a piano string. In order to get a thicker, longer piano string to sound equivalent to a shorter string at a higher pitch, we have to tension it much harder. However, the heavy string under more tension won't sound like the shorter string because the tension/mass relationship is different. However, if we thin or shorten the longer piano string, we reduce the vibrating mass. and it now requires similar tension levels and produces similar sound to the shorter string.

More to be added :)

Image: 1) Spectral Rolloff / Spectral Tilt Illustrated

Steeper harmonic roll off means less buzzy, less dense, and less heaviness.
Shallower harmonic roll off means more buzzy, more dense, more heaviness.

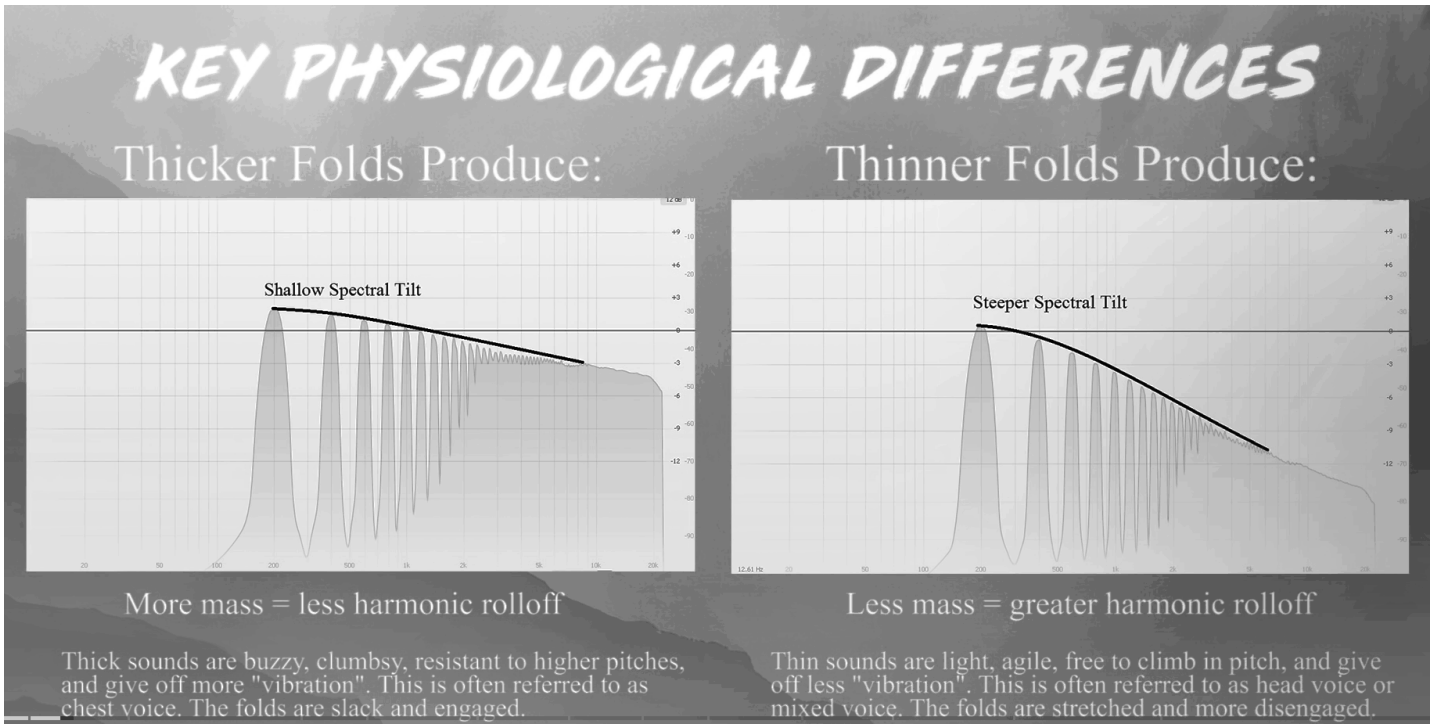
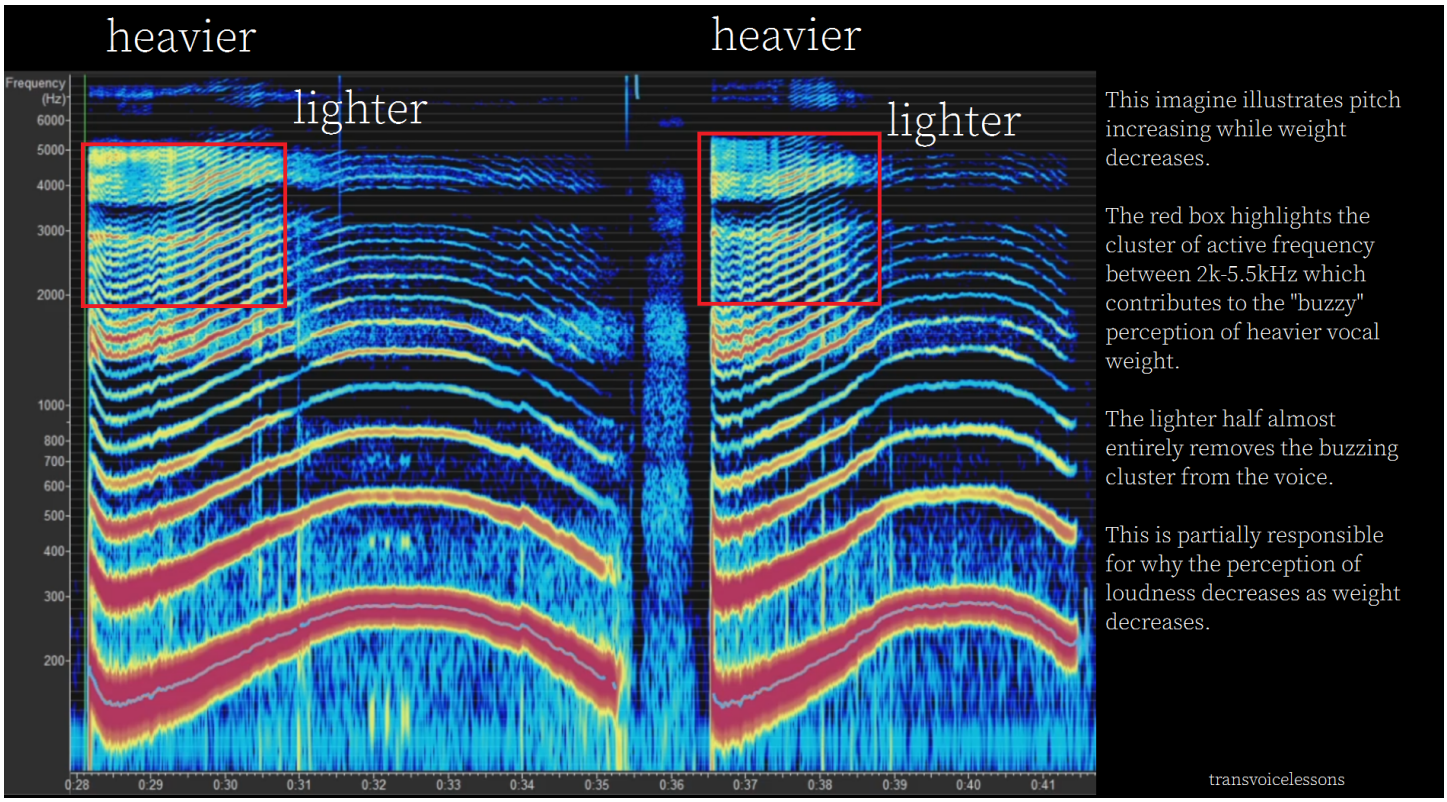


Image 2: Spectrographic Illustration of Heaviness vs Lightness in Changing Pitch



Essential Practice Loops

A practice loop is a pattern of practice that you can repeat over and over again in order to learn or develop a skill. The following practice loops are core to the process of behavioral voice alteration. As you become comfortable with performing each basic practice loop, begin exploring with the advanced version to further develop your ability with voice.

Learn the Sound Quality | Create a Mental Auditory Template

Basic

- Listen closely to examples of a sound quality.
- Observe the potential range of the sound quality.
- Describe how the sound quality changes at different points in its range.
- Practice discerning the sound quality from other sound qualities.

Advanced

- Observe the sound quality in other's voices.
- Notice how and why others shift the sound quality in their voices.
- Compare the degree of the sound quality in your voice and theirs.

Use the Sound Quality | Develop Motor Control

Basic

- Explore shifting a sound quality in your voice.
- Use an exploratory exercise to find a specific degree of the sound quality.
- Carry that degree of the sound quality into speech or song.

Advanced

- Imagine yourself using a specific degree of the sound quality.
- Attempt to use that degree of the sound quality from the very start of speech or song.
- Repeat this, intentionally using less effort to produce the same sound each time.

Normalize the Sound Quality | Establish New Behavioral Patterns

Basic

- Determine what degree of a sound quality best suits you.
- Familiarize yourself with the sound of your voice with that degree of the sound quality.
- Continue to use your voice in this fashion so that it becomes habituated, consistent, and easy.

Advanced

- Repeat this process to develop discrete sets of vocal behaviors, enabling you to have multiple 'voices'.
- Practice with each different 'voice' regularly to maintain your capacity to use them readily.

Always employ active, critical listening. One of the most important parts of training your voice is developing the ability to discern sound qualities of your own voice and to familiarize yourself with what it sounds like to shift those qualities to different degrees. You must be able to accurately and consistently identify sound qualities in order to reliably self-monitor during practice.

When practicing a sound quality, do so by focusing primarily on producing your idea of how shifting that quality sounds rather than focusing on using physical sensations. This will help you to make the skill autonomous, reducing the physical effort you use to produce the sound you want. You may find it helpful to take note of the involved physical sensations as you become more adept at controlling each sound quality.