WHISPERED VOWELS FOR SINGERS

A DISCUSSION AND EXPLORATION

Image courtesy of Michele A. Capalbo

MICHELE A. CAPALBO

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Abstract

The whispered "ah," (represented throughout with the International Phonetic Alphabet symbol /ɑ/) is a traditional Alexander Technique procedure, and has been represented as an effective way to improve functional singing issues, including respiration (Heirich 2011, 85; Kleinman and Buckoke 2013, 101) and phonation (Dimon 2015; Murdock 2009; McCallion 1988, 26–28; Jones 1976, 21). However, the use of whispering as an effective voice-building tool for singers has been consistently challenged over time (Titze and Verdolini Abbott 2012, 264). Due to the scarcity of quantitative findings, and conflicting anecdotal evidence, the tension between the pro- and anti-whispering advocates persists. This article examines current research in conjunction with multiple pedagogical perspectives to explore the whispered "ah" from a singer-centric perspective. Practical adaptations for singers are proposed through the exploration of al-ternate vowels, emotional affect, and shifting vocal color. Specific exercises for the articulators (tongue, jaw, and lips) both for tension release and/or adequate vocal tract tonus reintegration are proposed.

Whispering and the singing voice

The use of whispering in voice work is controversial primarily due to two possibly detrimental effects. The first is the drying of the vocal folds especially when coupled with oral inhalation, and the second is excess pharyngeal constriction that is easily introduced when whispering too loudly (Titze and Verdolini Abbott 2012, 264). There is quite a long tradition of physicians counseling their patients to avoid whispering or aspirate (breathy) phonation as a vocal rest strategy, since it can easily devolve into a constricted or forced stage whisper (Vaughn 2001, 53; Rubin 1966, 25). Vocal pedagogues, guided by medical advice, have also warned of the ill-effects of whispering, even for healthy voices. However, this opinion is not ubiquitous since in the singing world whispering might be used as a marking strategy—a technique used to conserve vocal health and alleviate

wear and tear during long rehearsals (Fleming, Titze, and Fleming 2017, 527; Miller 1990, 14).

When exploring the safety of whispering, it is worthwhile to briefly consider both healthy populations as well as patients diagnosed with vocal pathologies because habits are present regardless of vocal condition. Although whispering patterns have been found to vary widely (Konnai et al. 2017), habitual excess muscle constriction related to whispering has been documented in research studies (Solomon et al. 1989). Based on this, we must reexamine Alexander's 1923 assertion that whispering is desirable because it is "rarely associated with ordinary bad psycho-physical habits in vocalization" (205). The usefulness of whispering remains an active area of research today. Unilateral medical advice to avoid whispering after medical intervention, or for vocal health in general, is being reconsidered. This prevailing hypothesis was recently tested in a pilot study that suggested that a small percentage of patients may actually benefit from whispering (Sataloff et al. 2019, 559). The physicians conducting this study warn that further research is warranted before conclusions can be drawn.

Parsing Alexander's whispered /ɑ/ for singers

Alexander extolled the virtues of the whispered /ɑ/ specifically for training a controlled or extended exhalation (1918, 229). This is not surprising given that he was initially known as the "breathing man" (Carrington 1994, 64). The ability to control the exhalation is the foundation for breath management in singing (Heirich 2011, 85). The preliminary steps for this exercise, recounted by Jones (1976, 21–22), involve indirect tuning of the resonatory and articulatory systems comprising the soft palate, tongue, and jaw before any controlled exhalation occurs. The soft palate is implicated through an instruction to brighten the eyes and it helps to form an inner smile (Alexander 2015, 51; Dimon 2015, 29).

This is reminiscent of the *bocca ridente*, or inhaling through a smile, a direction dating as far back as Tosi's 1723 vocal pedagogy treatise. It is a clear example of pre-phonatory tuning of the vocal tract to enhance specific resonances wellsuited to the demands of classical singing. A higher vaulted soft palate that results from this instruction may not be compatible with more contemporary singing styles that benefit from a different vocal tract shape and lower palate (Popeil 2018, 92). For that reason, this instruction should be applied judiciously. Other specific instructions related to the articulators, including the tongue and jaw, are examined individually below.

Emotional "affect"

Kenneth Bozeman, a contemporary American vocal pedagogue specializing in classical music, advocates for a pharyngeal smile activated by using specific emotional intention for his *chiaroscuro* whispering exercise (2021, 45). This emerging exercise, based on an adapted whisper, uses emotive expression called "affect" (138) to provide a range of concurrent light and dark vocal colors (55). This *chiaroscuro* timbre, produced through complex intervocalic acoustic relationships, will be expanded upon later. It could be argued that Alexander's instruction to think of something funny (Carrington 1994, 148) mirrors the pharyngeal smile. Therefore, one could argue that emotional affect was explored and utilized by Alexander. This exploration has been reinforced by Alexander Technique teachers through the use of mirrors or with partners (Murdock 2009; Dimon 2015, 35). However, beyond the single instruction to think of something funny, the application of emotional affect to alter the perception of sung emotion has not yet been widely discussed. This perception can be affected by musical style, pitch, and even gender (Hakanpää, Waaramaa, and Laukkanen

2019). Bozeman argues that pleasurable emotions encourage brighter sounds and that feelings of tenderness or empathy encourage warmer vocal colors (2021, 33). The whispered /ɑ/ might be adapted to indirectly provide more vocal styles and tonal colors through the varied uses of emotional affect illustrated below.

EXPLORING EMOTIONAL "AFFECT"

Whisper then sing an /ɑ/ while thinking of something pleasurable (AH)

Whisper then sing an /ɑ/ while thinking empathetic thoughts (AW)

Vowel acoustics

Vocal sounds are acoustically complex. Every *sustained* frequency or pitch, regardless of the instrument, is perceptually heard as a vowel (Howell and Ragan 2019). Vowels are defined by the frequency's first two formants (Miller 2008, 123). Vocal pedagogues explain this composite sound in a couple of ways. Bozeman identifies complimentary under- and over-vowels colors that work together for a chiaroscuro or bright/dark timbre typical of a classical sound (2021, 41). A simpler approach is taken by Oren Brown, a former teacher at the Juilliard School of Music, who believes that the neutral schwa [ə] (about) is part of every vowel, which is then formed more precisely by the articulators according to the pitch and desired timbre or singing style (1996, 103). Why is this relevant to the whispered /ɑ/? As one becomes attuned to the complexity in vowel sounds, the ear can begin to differentiate between color and timbre possibilities affecting different musical styles. Vowels are influenced by many things including native accent, pitch, and intention or emotional affect. Educated ears can direct vowel color choices to meet the demands of multiple genres. Subtle alterations in a whispered vowel can tune the vocal tract to affect the desired sound.

To explore the inherent acoustic properties of vowels, extend the whisper on the following words. You should perceive a subtle descending pitch (Ladefoged and Johnson 2010, 22).

EXPLORING EMOTIONAL "AFFECT"

Whisper then sing an /ɑ/ while thinking of something pleasurable (AH)

Whisper then sing an /ɑ/ while thinking empathetic thoughts (AW)

It may be easier to hear the inherent pitch differences between the highest (heed) and lowest (who'd) pitched vowel frequencies when whispered side by side. Notice that if the middle of the tongue (dorsum) is permitted to drop in concert with the lips moving forward between "heed" and "who'd," the pitch differences may be more conspicuous. This phenomenon is not unlike the high/ low European siren. When imitating that sound, the vowels /i/ (heed) and /u/ (who'd) are often the defaults reflecting the natural acoustics of these vowels.

However, it's important to note that tongue, jaw, and/or lip tension can affect the pitch perception of these whispered vowels.

Why an /ɑ/?

Jones' account of the whispered /ɑ/ previously mentioned provides a road map to the exercise, yet the target vowel color remains an open question. Both Dimon (2015, 35) and Murdock (2009)

advocate for a bright /ɑ/. Perceptually, a bright vowel may even lean toward an /æ/ (hat), especially in certain geographical regions. Of course subjective terms like *bright* and *dark* are highly variable. From the above exercise either the "hod" or "hawed" may be characterized as an "ah" sound. Anyone who has observed a group of Alexander Technique teachers or students executing the whispered /ɑ/ will have noticed a variety of timbres and vowel colors on display. We are not carbon copies. It has been argued that an /ɑ/ is used because it is the most open and "left alone" of all vowels (Dimon 2015, 35). To validate that claim, we must consider what, and more specifically *where*, that openness is located. Viewed from the front, the /ɑ/ vowel reveals an open oropharynx with a tongue position that looks relatively flat and relaxed. However, in singing we must consider the whole vocal tract from the glottis to the lips. From this viewpoint, you may notice that an /ɑ/ impinges more in the posterior laryngopharyngeal region in relation to every other vowel (McCoy 2012, 43; Dimon 2011, 88). Stated another way, the /ɑ/ has an open mouth cavity but the tongue mass must go somewhere; therefore, it shifts somewhat into the back of the throat. The commonly held belief that /ɑ/ is the most open-throated vowel, while /i/ (heed) is perceived as more closed, has been called a "perception deception" (Bozeman 2021, 21). In other words, when considering the entire vocal tract from the vocal folds to the lip opening, the perception that /ɑ/ is produced with the most open throat is physiologically false (Bozeman 2021, 11). From a practical pedagogical perspective, this means that if tongue root tension or a depressed larynx is a concern, other more neutral vowels with a higher tongue orientation ought to be considered in lieu of an /ɑ/. Remember the /ɑ/ naturally encroaches on the back of the throat.

Pre-phonatory tuning

Scientifically minded voice teachers have noted the necessity for pre-phonatory tuning especially during the inhalatory phase to facilitate balanced phonation (Brown 1996, 189; Miller 1986, 39–40). Since vocalization requires the coordination of over 100 muscles (Moss Erickson 2021), the glottis, vocal tract, and respiratory system must be appropriately toned and balanced before an intentional sound can be created. The desired pitch, volume, and timbre is created by equalizing vocal fold function with breath pressure, which is then filtered through various vocal tract shapes (Miller 1986, 2; Engelhart 1989).

Ideally, when the intention to phonate in a particular way is present, this occurs automatically. This preparatory phase may not be felt, although a singer can cultivate awareness in certain contributing areas. We know that specific coordination is present in the motor system because the readiness potential can be independently observed through instrumentation like electromyography (Engelhart 1989). To clarify, this does not mean that pre-phonatory tuning is consciously prepared and held—merely that tensional balance must be present before specific phonation demands can be met. It's worth noting that preparation for a more efficient or resonant sound has been shown to be quicker than when producing a strained or pushed sound (Shiba and Chhetri 2016, 1837). Phonation efficiency and awareness of this dynamic balance is honed through practice.

Exploring the whispered /ɑ/

There are a few exercise strategies for incorporating the whispered /ɑ/ into phonation. A typical approach from the Alexander Technique world is to use voiced and unvoiced spoken consonant pairs as a gateway (Dimon 2015, 41). William Vennard, a respected voice teacher from the twentieth century, believed that whispering entire lines of text may indirectly improve singing clarity and projection (1967, 182). In either case, the point is to tune the vocal tract without the stimulus

of sung tones. However, if you are working with a singer, sooner or later you will be exploring sung phonation.

As discussed, terms such as bright or dark are subjective and relate to an individual's accent and habits. A subtle acoustic shift, facilitated by changes in the vocal tract, may be beneficial. I therefore advocate for an exploration of closely related vowels from /ɑ/ (father) to /ʌ/ (up). Switching between /ɑ/ and /ʌ/ will likely reveal subtle changes in tongue, jaw, and even lip orientation. As you shift between /ɑ/ and /ʌ/, continue to notice the quality of the sound. Notice changes in the tonus of the tongue and any downward pressure at the back of the throat and larynx, especially if that is a concern while performing the whispered /ɑ/. Some vocal pedagogues move even farther from the /ɑ/ suggesting that we ought to use the developmental vowel sound /ə/ (above) as the foundation for all vowels (Brown 1996, 103). Notice what your /ə/ sounds like and how it might differ from your /ʌ/ both in sound and vocal tract shape. The difference between these two similar vowels may be related to the emphasis placed on them. The /ʌ/ is stressed or accented, while the /ə/ is not. Notice subtle shifts in tongue and jaw. Reintroduce the thought of allowing the vowel to be bright and clear. Think of something pleasant and notice how a specific emotion changes the quality of the vowel you are exploring.

INCORPORATING VARIATIONS IN THE WHISPERED /ɑ/

Glide between /ɑ/ and /ʌ/

Glide between /ɑ/ and /ə/

So far, we have looked at the /ɑ/ as well as neutral vowel sounds that employ a tongue orientation with greater laryngopharyngeal space at the tongue root, and slightly more tonus in the tongue. Exploring whispers though the relatively neutral vowels /ʌ/ and /ə/ along with the traditional /ɑ/ can be helpful in the initial tension release stages of the technique. However, the functional issue of flexible tonus in the vocal tract and respiratory system must also be addressed when working with singers. When incorporating whispering into voice training, there is no all-encompassing reason for vocal coordination to be trained entirely through an /ɑ/. As we will see, a sustained sung /ɑ/ may actually pose an acoustic disadvantage for some singers.

What changes during sung phonation

One of the differences between speech and singing is the elongation of vowels, which function as the primary sound carrier. Since singing provides a large stimulus, a single note is a sensible place to begin when introducing sung phonation into whispered vowels. Ideally, this simple vocal task would be in the lower middle voice and sung at a fairly soft dynamic. When integrating the whisper into a sustained sung tone, it is helpful to remember that vowels are associated with a perceptual pitch. The fundamental frequencies for cardinal vowels /i, e, a, ɔ, u/ range over an octave from E4 /i/ (heed) and /u/ (moon) to G5 /a/ (McCoy 2012, 45). Therefore, in the lower part of the classical treble voice, an /i/ or /u/ is often more helpful because each is acoustically aligned with these lower fundamental frequencies. It is common for classical female or treble singers to sound weak or unstable on an /ɑ/ in their lower range (Patinka and Nix 2020) because the first formant frequency of an /ɑ/ lies too high to facilitate the easiest phonation. This alignment is important because treble voices rely on a strong fundamental frequency to project. In other words, singing in the most acoustically effective range for an /ɑ/ would not be low in pitch, nor would it likely be soft, unless you are working with an expert-level singer. This suggests that an /ɑ/ is

an imperfect vowel choice for the simple sung vocal task previously defined for classical treble voices. Females singing in contemporary genres, on the other hand, tend to benefit from brighter sounds like /æ/ (cat). Therefore, adjusting the vowel tuning away from the back vowel /ɑ/ and toward a more forward /æ/ may be helpful for singers pursuing these styles.

Tongue

Three articulators hold the most sway over sung vowels. They are the tongue, the lips, and the jaw (Doscher 1988, 120; Brown 1996, 104–106; De Alcantara 2013, 139). We begin our exploration of an active or toned tongue through the introduction of the /i/ vowel. Using /i/ as a foundational vowel for all styles of voice building is a strategy on which a number of contemporary pedagogues rely (Chapman 2006, 276; Brown 1996, 104–106). Alexander Technique teacher Jane Heirich introduces the /i/ into her singing exercises early on in order to contrast the differences in vocal tract space and muscle tone between the /ɑ/ and /i/ vowels (2011, 91).

Australian pedagogue Janice Chapman believes that toning the tongue using an /i/ as the default vowel creates tongue flexibility and results in clearer vowels, especially for classical singers (2006, 276). The tongue must be more than merely relaxed. Brown specifies that the practical functions of an /i/ are to incorporate proper tonus as well as to encourage tongue independence (1996, 104). If the /i/ lacks tone and clarity, a /j/ (yes) can be added before the /i/ to inform the arch of the tongue (Montgomery 2018, 314).

EXPLORING AND DEVELOPING TONUS IN THE ARCH OF THE TONGUE

Whisper gliding between /ɑ/ and /i/, noticing the tongue

Allow the tongue to form a /j/, releasing the tongue into a whispered /i/

When tonus is established, whisper an /i/ then glide to /ɑ/, /ʌ/, /ə/ or /æ/

The tongue dorsum is generally considered to be at its highest when singing an /i/. However, this can vary depending on the style of music that is being sung. You will likely observe a more high-arched tongue in classical singers. As previously noted, /j/ can be helpful to find this height; however, the /i/ shape can also be correlated to a sustained /ŋ/ (sing) sound, which classical teachers rely on to promote the ringing tone required in this style (Jones 2017, 56; Brown 1996, 88). If you explore the /ŋ/, you will note that you are initiating the oral seal position. That is to say the tongue dorsum meets the soft palate and any sound produced exits through the nasopharynx unless the tongue releases the seal.

The /ŋ/ conditions the tongue in a very active way and, coincidentally, seems to be the method advocated by Murdock to begin the whispered /ɑ/ (2009). Notice that if you execute a whispered /ɑ/ while maintaining this vocal tract orientation with a high-arched tongue, the vowel color will tilt toward an /æ/ and is likely to sound much brighter and more open.

USING AN ORAL SEAL TO INITIATE WHISPERED VOWELS

Release the tongue from the /ŋ/ posture to whisper an /i/

Glide between /ŋ/, /i/, and /ɑ/ in various combinations

Try these variations both whispered and sung

Recalling that vowels have specific frequency relationships, we can reasonably state that both female belters and classical males in their higher range phonate in the exact same frequency range and with the same mechanical laryngeal adjustment known colloquially as a chest voice dominant sound (McCoy 2012, 144). That is why these seemingly disparate voice types may benefit from a similar approach by taking advantage of natural vowel acoustics. Brighter, more forward vowel sounds such as /e/ (fade), /ɛ/ (fed), or /æ/ (cat) can be of particular use to female belters or classical male singers developing their high notes (McCoy 2012, 155–6).

EXPLORING BRIGHTER VOWELS TO EXTEND THE CHEST VOICE UPWARDS

From close to open /e/ /ɛ/ /æ/, first whispered then sung

From open to close /æ/ /ɛ/ /e/, first whispered then sung

Whispering and singing brighter vowels between their close to open orientations is one way to explore the acoustics that may benefit a specific singer at a particular stage in their development. Remember, a higher-arched tongue may benefit a classical sound while impeding a contemporary sound, but that is not a hard-and-fast rule.

Jaw

The whispered /ɑ/ instruction pertaining to the jaw is worth discussing since the direction to drop the jaw forward and down conflicts with many current and historical vocal pedagogues who state that when the jaw is released it drops down and in (Jones 2017, 63; Brown 1996, 12). I contend that if direct jaw intervention is judged necessary, it should be assessed on a case-by-case basis depending on the physiognomy of the individual. Identifying a hole at the temporomandibular joint (Davies and Barlow 2002, 106) may be misleading since that void also appears in other jaw configurations. Singers with a naturally retracted mandible, like Alexander displays in sagittally oriented candid photos, may well benefit from dropping the jaw forward and down. On the other hand, the same instruction may not benefit someone with a more forward or neutral mandible.

Alexander Technique teacher and singer Ron Murdock avoids the forward jaw statement, merely indicating that the jaw should hang freely (2009). This mirrors my experience with singers who often find that explicit instruction to move the jaw either forward or backward often introduces or increases tension. A return to indirect means is probably the best course when it comes to the jaw. After all, motor learning theory tells us that an overcorrection of something that is essentially correct for the individual is likely to cause overcompensation and can negatively affect the learning process (Steinhauer and Grayhack 2000).

Since singing is expressed through words, clear text facilitated by articular independence is of paramount importance. Although the tongue is considered the primary articulator for speech (Webb and Adler 2008, 114), jaw opening is another vital component. One way to explore this independence is to play with paired vowels, investigated next. The following exercise alters only the degree of jaw opening while maintaining the arch of the tongue (Montgomery 2020, 305–306).

Alternate slowly between the following paired vowels on an extended whispered tone that sustains the initial vowel. Be careful to avoid diphthongs. Notice as you move from the initial close vowel that the jaw is more closed and it opens for the second more open vowel. Allow the tongue to remain where it is. Notice if you are able to uncouple the tongue from the jaw and how the vowel changes through the movement of the jaw alone. Once you're satisfied that your whisper displays sufficient tongue and jaw independence, add sung phonation using the simple vocal task previously identified.

EXPLORING THE JAW: VOWEL COUPLING EXERCISE

/i/ (heed) to /ɪ/ (hid)

/e/ (fade) to /ɛ/ (fed)

/u/ (food) to /ʊ/ (foot)

/o/ (hotel) to /ɔ/ (hot)

This is admittedly a simplified understanding of the spatial possibilities and flexibility of the vocal tract articulators. Palate raising, a natural consequence of an inner smile, and change in laryngeal height are other articular elements affecting pharyngeal space. Those two elements, however, are more indirectly engaged and are harder for students and teachers to see and sense. This is something to keep in mind depending on the level of singer in front of you, or your own level of expertise. For a novice singer, the invitation to think of something funny while working toward tongue tonus with jaw and lip independence is a helpful place to begin.

Lips

Unlike most other singing pedagogues, Brown uses whispered tones as a precursor to phonation. He organizes his approach into two main categories: vowels formed predominately by the tongue centering around the /i/, which has been previously discussed, and those formed by the lips employing an /u/ (1996, 104–106). On both sides of the /i-u/ continuum, the use of whispered phonation can be an effective method to define articular independence without the distraction of sound. While the lips are not directly addressed in traditional whispered /ɑ/ instructions, this article presents alternative options for training singers, necessitating the inclusion of the lips. The principle articulators (tongue, jaw, and lips) will ideally attain some independence while working interdependently. Articular flexibility affects everything from text clarity to stylistic timbre. For example, a high tongue dorsum divides the vocal tract into two distinct areas, the oropharynx and the laryngopharynx. This vaulted tongue position contributes to the ringing sound desired in classical singing (Bozeman 2021, 22) and is reinforced by a convergent (forward gathered) lip shape to maintain that vocal quality. Contemporary singing styles, on the other hand, tend to use a more divergent mouth orientation, spreading the lips into a megaphone shape, and often rely less on tongue height (Bozeman 2021, 23). There is no ideal shape for all singers. Vocal tract shapes change depending on the individual and stylistic demands of the music.

The lips define the perceived openness or brightness of a vowel and, as noted above, are a significant contributor to timbre and musical style. Lip independence can be explored through the /i/ and /ɑ/, which can both be performed with convergent and divergent lip shapes. As before, begin by whispering each vowel separately on a single pitch, shifting only the orientation of the lips between a forward gathered position and one that is wide and spread. Once you can move the lips independently while whispering, add sung tones. Notice the timbral changes that result from moving the lips alone. You may perceive that an /i/ sounds brighter in a divergent shape while gathering the lips toward the front makes the /i/ sound warmer and darker. Similarly, a convergent /ɑ/ will sound rounder and richer, while the wider /ɑ/ will sound brassier. Remember to move the lips only independently of the jaw and tongue.

CONVERGENT AND DIVERGENT LIP ORIENTATION

/ɑ/ - glide between forward gathered lip and wide lip orientations

/i/ - glide between forward gathered lip and wide lip orientations

This lip exploration addresses articulator independence while developing the ear. Listen to all the possible vowel colors that exist on this continuum. You will likely discover that an optimal sound will involve movement and changes from more than one articulator. However, if the tongue, jaw, and lips can move independently, a singer's timbral choices are expanded.

Conclusion

This article presents a few options for whispered and sung vowel explorations to support tension release and to build tonus while taking advantage of a vowel's inherent acoustics. Emotional affect, akin to Alexander's instruction to think of something funny, can be expanded through the use of other emotions to encourage alternate vocal colors. The /i/ vowel is helpful to tone the vocal tract, most notably the tongue. Independence of the tongue, jaw, and lips may all be aided through the use of a whisper and more fully explored through sustained voice. Adding sung phonation to whispered tones should begin with a simple, trouble-free vocal task in the low to middle voice and sung at a moderately soft dynamic. Not all vowels are as suitable for ease of singing throughout the voice. Explorations using whispered vowels may benefit singers of all styles and can be tailored to meet specific acoustic needs when moving into phonation. Playing with various vowels, with and without the stimulus of a sung sound, can help to educate the ear on possible vowel colors and timbres.

There is one final general word of caution. Singers with a predisposition toward a pressed or pushed phonation may benefit from working from a contrasting whispered vocal onset. However, care should be taken if using whispered tones with a singer who has an inherently breathy phonation, unless an aspirate vocalization is the ideal target sound. This may be the case with some jazz singers who hold their microphones close. Whispering remains an unsettled topic in vocal pedagogy. There is not enough information to unequivocally state that whispering is either helpful or injurious. Few singing pedagogues embrace the use of a sustained whisper in the voice studio. At the present time, its use is very much the exception rather than the rule. Available data indicate

IPA symbol	English equivalent	IPA symbol	English equivalent
/ɑ/	father	/ʌ/	up
/ə/	above	/æ/	hat
/i/	heed	/ɪ/	hid
/u/	moon	/ʊ/	foot
/e/	fade	/ɛ/	fed
/o/	hotel	/ɔ/	hot
/j/	yes		

Table 1: International phonetic alphabet sounds and English equivalents

that the usefulness of whispered tones is likely dependent on the individual.

References

Alexander, F. Matthias. 1918. *Man's Supreme Inheritance*. Rev. ed. London: Methuen.

Alexander, F. Matthias. 1923. *Constructive Conscious Control of the Individual*. New York: E. P. Dutton and Company.

Brown, Oren L. 1996. *Discover Your Voice: How to Develop Healthy Voice Habits*. San Diego: Singular.

Bozeman, Kenneth. 2021. *Kinesthetic Voice Production*. Gahanna, oh: Inside View Press.

Carrington, Walter. 1994. *Thinking Aloud: Talks on Teaching the Alexander Technique*. Berkeley, cA: Mornum Time Press.

Carrington, Walter and Carey, Sean. 2001. *Personally Speaking: Walter Carrington on the F. M. Alexander Technique in Discussion with Sean Carey.* London: Mouritz.

Chapman, Janice L. 2006. *Singing and Teaching Singing: A Holistic Approach to Classical Voice*. San Diego: Plural.

De Alcantara, Pedro. 2013. *Indirect Procedures*. 2nd ed. Oxford: Oxford University Press.

Dimon, Theodore. 2015. *Breathing and the Voice: A Practical Guide to the Whispered "ah."* Rev. ed. uS: Day Street Press.

Dimon, Theodore. 2011. *Your Body, Your Voice: The Key to Natural Singing and Speaking*. Berkley, cA: North Atlantic Books.

Doscher, Barbara M. 1988. *Functional Unity of the Singing Voice.* Metuchen, nJ: The Scare¬crow Press.

Engelhart, Robert James. 1989. "An Electromyographic Study of Preparatory Set in Singing as Influenced by the Alexander Technique." PhD diss., Ohio State University.

Fleming, Rachelle, Ingo Titze, and Renée Fleming. 2017. "The FlemIngo Stance on Marking" *Journal of Singing* 73, no. 5 (May/June): 527–30. Doi: http://dx.doi.org/10.53830/cska8292

Jones, David L. 2017. *A Modern Guide to Old World Singing: Concepts of the Swedish-Italian and Italian Singing Schools*. Self-published.

Jones, Frank Pierce. 1976. *Body Awareness in Action: A Study of the Alexander Technique.* New York: Schocken Books.

Hakanpää, Tua, Teija Waaramaa, and Anne-Maria Laukkanen. 2019. "Emotion Recognition from Singing Voices Using Contemporary Commercial Music and Classical Styles." *Journal of Voice* 33, no. 4 (July 2019): 501–509. https://doi.org/10.1016/j.jvoice.2018.01.012. Doi: http://dx.doi.org/10.1016/j.jvoice.2018.01.012

Heirich, Jane Ruby. 2011. *Voice and the Alexander Technique: Active Explorations for Speaking and Singing*. 2nd ed. Berkeley, cA: Mornum Time Press. Doi: http://dx.doi.org/10.1017/s0265051705256413

Howell, Ian, and Kari Ragan. 2019. "The Special Psychoacoustics of the Singing Voice." nATS Chats. Recorded March 10, 2019. YouTube video, 60 min. https://www.youtube.com/watch?v=Ud3yHDiP42o.

Kleinman, Judith, and Peter Buckoke. 2013. *The Alexander Technique for Musicians*. New York: Bloomsbury.

Konnai, Ramya, Ronald C. Scherer, Amy Peplinski, and Kenneth Ryan. 2017. "Whisper and Phonation: Aerodynamic Comparisons Across Adduction and Loudness." *Journal of Voice* 31, no. 6: 773.e11æ–773.e20. DOI: http://dx.doi.org/10.1016/j.jvoice.2017.02.016

Ladefoged, Peter, and Keith Johnson. 2010. *A Course in Phonetics*, 6th ed. Cengage Learning.

McCallion, Michael. 1988. *The Voice Book: For Actors, Public Speakers, and Everyone Who*

Wants to Make the Most of Their Voice. London: Faber and Faber.
McCoy, S. 2012. *Your Voice: An Inside View*. 2nd ed. Delaware, oh: Inside View Press.
Miller, Donald Gray, and Scott McCoy. 2008. *Resonance in Singing: Voice Building Through Acoustic Feedback.* Princeton, nJ: Inside View Press.
Miller, Richard. 1986. *The Structure of Singing*. New York: Schirmer Books.
Miller, Richard. 1990. "The Technique of Marking." *The NATS Journal* 46, no. 4 (March/April): 14–15, 46.
Montgomery, Cheri. 2018. "The Voice and Diction Connection: A Diction Instructor's Approach to Voice Pedagogy." *Journal of Singing* 74, no. 3 (January/February): 313–21.
Montgomery, Cheri. 2020. "Diction (Still) Belongs in the Music Department." *Journal of Singing* 76, no. 3 (January/February): 301–309.
Moss Erickson, Heidi. 2021. "Biofeedback in Vocal Pedagogy Course: RealTime Success Using Mobile Application Technology." April 15, 2021.
Online Short Course through VoiceWorkshop.co.uk. Replay no longer available.
Murdock, Ron. 2009. "Alexander Technique: The Whispered Ah." Uploaded April 26, 2009. 4:56 min. https://www.youtube.com/watch?v=J1ga2ThmuE8.
Patinka, P. M., and John Nix. 2020. "Changes in Vibrato Rate, Vibrato Extent, and Vibrato Jitter in Soprano Voices in Response to Changes in Mouth Opening: A Pilot Study. *Journal of Singing* 77, no. 2 (November/ December): 213–8. DOI: http://dx.doi.org/10.1121/2.0000067
Popeil, Lisa. 2018. "Baking a Great Belting Sound." In *Voice Teacher's Cookbook*, edited by Brian J. Winnie, 90–92. Delray Beach, fl: Meredith Music Publications.
Rubin, Henry J. 1966. "Role of the Laryngologist in Management of Dysfunctions of the Singing Voice." *NATS Bulletin* (May): 22–27.
Sataloff, Robert T., Susan E. Cline, Karen M. Lyons, Jean Skeffington, and Adam D. Rubin. 2019. "Voice Rest." Journal of Singing 75, no. 5 (May/ June): 557–64. https://www.nats.org/_Library/JOS_On_Point/JOS-075-5-2019-557_-_Voice_Rest_-_Satalof_-_Cline_-_Lyons_-_Skeff¬ington_-_Rubin.pdf. This article was modified from Robert Thayer Sataloff, *Professional Voice: The Science and Art of Clinical Care*, 4th ed. (San Diego: Plural, 2017). DOI: http://dx.doi.org/10.1056/nejmbkrev39595
Shiba, Travis, L., and Dinesh K. Chhetri. 2016. "Dynamics of Phonatory Posturing at Phonation Onset." *Laryngoscope* 126 (August): 1837–1843. DOI: http://dx.doi.org/10.1002/lary.25816
Solomon, Nancy Pearl, Gerald N. McCall, Michael W. Trosset, and William C. Gray. 1989. "Laryngeal Configuration and Constriction During Two Types of Whispering." *Journal of Speech Language and Hearing Research* 32 (March): 161–74. 161.doi:10.1044/jshr.3201.161. DOI: http://dx.doi.org/10.1044/jshr.3201.161
Steinhauer, Kimberly, and Judith Preston Grayhack. 2000. "The Role of Knowledge of Results in Performance and Learning of a Voice Motor Task." *Journal of Voice* 14, no. 2: 137–45. DOI: http://dx.doi.org/10.1016/s0892-1997(00)80020-x
Titze, Ingo R., and Katherine Verdolini Abbott. 2012. *Vocology: The Science and Practice of Voice Habilitation*. Salt Lake City: National Center for Voice and Speech.
Tosi, Paolo F. 1723. *Observations on the Florid Song*. 2nd ed. (1967). Translated by J. E. Galliard (1743). William Reeves Bookseller Ltd.
Vaughn, Susan. 2001. "A Singer's Guide to Vocal Care." *Journal of Singing* 57, no. 3 (January/February): 53–60.
Vennard, William. 1967. Singing the Mechanism and the Technic. New York: Carl Fischer.
Webb, Wanda G., and Richard K. Adler. 2008. *Neurology for the Speech-Language Pathologist*, 5th ed. St. Louis, Mo: Mosby Elsevier.