




2018

THE LANGUAGE OF MUSIC: LINGUISTICS IN TRUMPET PEDAGOGY

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Digital Object Identifier: <https://doi.org/10.13023/ETD.2018.162>

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Recommended Citation

Youngs, Marisa B., "THE LANGUAGE OF MUSIC: LINGUISTICS IN TRUMPET PEDAGOGY" (2018). *Theses and Dissertations--Music*. 115.

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THE LANGUAGE OF MUSIC: LINGUISTICS IN TRUMPET PEDAGOGY

Doctor of Musical Arts Project

A DMA project submitted in partial fulfillment of the
requirements for the degree of Doctor of Musical Arts in
the College of Fine Arts
at the University of Kentucky

By

Marisa Beth Youngs

Lexington, Kentucky

Co-Directors: David Elliott, Associate Professor of Horn
and Dr. Jason Dovel, Assistant Professor of Trumpet

Lexington, Kentucky

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ABSTRACT OF MUSICAL ARTS PROJECT

THE LANGUAGE OF MUSIC: LINGUISTICS IN TRUMPET PEDAGOGY

For decades, many brass teachers have relied heavily upon speech as a means of conveying pedagogical concepts. Additionally, a significant number of teachers in the brass community continue to use speech sounds to teach specific kinesthetic responses (i.e. using specific vowels for tone production, particular consonants for articulation, and variations of vowels for different pitch registers). These teaching concepts have been perpetuated over time, though many intricate aspects of human anatomy were yet to be understood at the inception of these methods, including the physiological processes used during speech. As technology has evolved, researchers in the field of linguistics have made significant discoveries regarding the production and perception of speech. As a result of these innovations, researchers now understand more about individual languages than ever before. This document aims to critique popular beliefs regarding speech directives often utilized in trumpet pedagogy, such as guiding a student by saying “tah,” “too,” “tee,” etc. to produce a desired sound concept.

A significant portion of this document also outlines an ultrasound experiment conducted by the author in the Phonetics Laboratory at the University of Kentucky, in which exercises were designed to determine if speech vowels are in fact used during trumpet playing. During this study, subjects wore a lightweight headset with an ultrasound probe placed under the chin. The ultrasound probe allowed the researcher a midsagittal (side) view of the subject’s oral cavity, displaying vowel placements and articulatory phenomena. While using the ultrasound imaging technology, subjects played a short selection of musical exercises on B-flat trumpet and then read aloud a pre-selected list of English words, designed to display multiple combinations of vowel and consonant pairings. Both the trumpet exercises and reading of the word list were audio recorded and simultaneously paired with the corresponding ultrasound video data. After playing the selected exercises, subjects completed a brief written questionnaire of personal language history to ascertain possible influences upon dialect. The ultrasound videos were then analyzed with the audio recordings to map each individual’s tongue placements during speech as compared to the placements utilized during trumpet playing. The author concluded that a majority of participants did not use the specific placements of speech vowels while playing the trumpet, although some participant data displayed a slightly

stronger correlation than others. While many conclusions could be drawn from this research study, the corresponding data is intended for a purely observational understanding of the influence of linguistics upon trumpet performance and pedagogy. This document is presented in two parts: Part I contains introductory research material, as well as the process, analysis, and conclusions from the experiment outlined above. Part II contains recital programs and corresponding program notes in fulfillment of the degree of Doctor of Musical Arts in Trumpet Performance, as well as a personal vita.

KEYWORDS: Trumpet, Brass, Linguistics, Phonetics, Ultrasound

Marisa Beth Youngs

April 24th, 2018

THE LANGUAGE OF MUSIC: LINGUISTICS IN TRUMPET PEDAGOGY

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April 24th, 2018

To the multitude of music educators in my life, who inspired and encouraged me to follow my passion. To all current and future music educators, who will continue to change lives and make the world a more human place through music.

Acknowledgements

This research would not have been possible without the assistance of my vast support system, both personal and professional. Thank you to my parents and family, who have supported my every endeavor. Your love and support gave me the courage to pursue my dreams and continue to be the foundations of my life. Thank you to Dr. Jason Dovel, for three years of musical inspiration and your vast pedagogical knowledge, which came to me at the exact moment in my performance career when I needed it most. Thank you to Dr. Kevin McGowan, for agreeing to work on such a time-consuming research project. Without your tutelage during my independent study and many hours spent in the lab, this research would have been a fleeting idea on a page. Thank you to the other members of my committee and outside reviewer, Professor David Elliott, Dr. Michael Baker, Dr. Noemi Lugo, and Dr. Fabiola Henri-Martin, for your guidance throughout my studies and your feedback on my document. Thank you to the University of Kentucky Linguistics Department, for the use of the Phonetics Lab and equipment necessary for my experiment. Thank you to all of the participants in my experiment. Without you, there would be no data at all. Thank you to my previous trumpet teachers, Carl Miller, Robert Dolwick, Kevin Eisensmith, and Terry Everson. I am reminded of your teaching, performance, and compassion every time I pick up the trumpet. Lastly, thank you to my friends both near and far, many of whom gave feedback on my research and all of whom have endured my endless discussions of music pedagogy, though these are far from finished.

"This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."¹

– Winston Churchill, 1942

¹ "The End of the Beginning," The Churchill Society, accessed April 12, 2018, <http://www.churchill-society-london.org.uk/EndoBegn.html>.

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CHAPTER ONE

INTRODUCTION TO LINGUISTICS AND TRUMPET PEDAGOGY

In many circles, music has been deemed a “universal language.” However, individual native languages and dialects have the potential to significantly affect the way music is performed and taught. Specifically, the physical production of vowels and consonants differs widely among the many diverse languages of the world and is measurably different when comparing various dialects within the same language. This is especially relevant to the topic of music pedagogy, as wind and brass musicians not only use speech to convey pedagogical concepts, but also use the muscles of speech production during performance. This unique relationship gives language the potential to directly impact aspects such as articulation and the varying tongue positions that wind players associate with register changes, especially on brass instruments, which require the use of purely physiological elements to ascend in the harmonic series, without the aid of an octave key. Teachers often describe these tongue positions using speech vowels in many traditions of brass teaching. A plethora of published trumpet method books contain prefaces in which the authors discuss tongue position and oral cavity formation using the written equivalent of spoken directives. These are often in the form of consonant and vowel combinations (commonly “tah,” “too,” “tu,” “doo,” etc.), which are intended to direct the student toward proper sound production. These instructional books range in difficulty from beginning books for novice students to the most difficult studies intended for advanced players and professionals. The discussion of these various method books is directly relevant to linguistic research, as many teachers and performers utilize these

resources daily, yet virtually no definitive linguistic research has been found that verifies the efficacy of one particular speech directive over another.

The study of linguistics is a rather broad field, containing a multitude of highly specific sub-fields of study. In its most basic definition, linguistics is the study of language and encompasses all studies of the development, learning, adaptation, context, social ramifications, and other aspects relating to language. For this research, phonetics is the most relevant sub-field of linguistics, as it is the study of the sounds of human speech.² More specifically in this research, the further sub-field of articulatory phonetics is employed to analyze data. Articulatory phonetics is the study of *how* speech sounds are produced, by analyzing the physiological structures used during speech.³ This field is directly related to trumpet playing, as wind and brass musicians utilize the muscles of the throat, tongue, and face during the playing of even a single note, yet the majority of these processes cannot be viewed by the naked eye alone.

While consciously changing the position of the tongue was once hotly debated in the brass community, it was objectively proven in the studies using cinefluorography (X-ray videos) in the late 1960s that the tongue does in fact shift for different pitch registers.⁴ In another more recent example, Sarah Willis, horn player with the Berlin Philharmonic, was recently part of an observational study using a Magnetic Resonance Imaging (MRI) machine at the Biomedical Nuclear Magnetic Resonance Lab at the Max Planck Institute

² Peter Ladefoged, *A Course in Phonetics* (Boston: Wadsworth, 2010), 2.

³ Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), xxii.

⁴ Lyle C. Merriman and Joseph A. Meidt. "A Cinefluorographic Investigation of Brass Instrument Performance." *Journal of Research in Music Education* 16, no. 1 (1968): 31-38.

in Göttingen, Germany.⁵ This study produced videos that clearly show tongue movement during register changes, even to the untrained eye.

In addition, the majority of current brass teachers often use some type of spoken suggestion to direct students for articulation or register changes, sometimes even if it is not a conscious pedagogical decision. This has been a common phenomenon for decades, corroborated by the surveys of Dr. Lewis Edward Hiigel in the late 1960s. These questionnaires surveyed more than 80 band directors, nearly all of whom responded that they taught speech vowels and consonants to direct their young students to articulate properly.⁶ In the majority of cases, even teaching the first note on the trumpet often requires the teacher to verbally direct the student, especially when attempting to teach articulation in a simplistic manner.

In addition, some teachers advocate the use of specific vowels for corresponding registers. A common belief in the brass community is that the simplified form of vowels from “low to high” would be produced as “AH-OO-EE” or “OH-AH-OO-EE,” which some believe correspond directly to the register of the pitch.⁷ A number of brass teachers and method books tend to reference these “simplified” written vowel sounds, instead of the vowels used in the International Phonetic Alphabet (IPA) during instruction. For a more definitive linguistic analysis, this research will reference IPA vowels in addition to

⁵ Sarah Willis. “Sarah’s Music - Music and Science.” Duration 12:05. Posted September 2016, <http://www.dw.com/en/sarahs-music-music-and-science/av-18404705>.

⁶ Robert F. Noble, “Review: The Relationship of Syllables to Pitch and Tonguing in Brass Instrument Playing.” *Bulletin of the Council for Research in Music Education*, no. 18 (1969): 44.

⁷ To the author’s knowledge, a definitive survey has not been conducted regarding specific vowels for various registers in brass playing. However, the author has come across numerous blogs, articles, and method books that display this common belief. The author has also personally encountered many teachers in private lessons and masterclasses who advocate for the use of syllables to change registers.

the common spoken directives found in method books. While using basic vowel information with a student may yield the desired result, this research aims to highlight that speech vowels and the tongue placements used in trumpet playing are significantly more complex and variable than the simple spoken directives of “AH-OO-EE” that some teachers utilize in brass instruction. The following chapters outline method books and articles on the subject of vowels in brass pedagogy and the majority of this research outlines an experiment performed by the author, involving ultrasound images comparing the oral cavity during speech and trumpet playing.

CHAPTER TWO

OVERVIEW OF TRUMPET METHOD BOOKS

The purpose of surveying method books is to highlight the significant use of speech vowels in trumpet pedagogy. Not only are these directives used in verbal communications between teacher and student, but pedagogues found these to be of such vital importance that many authors took great care to “spell out” the exact vowel and consonant formations that each considered to be the most beneficial for sound production. The following overview of trumpet method books is not intended to be a complete collection of all existing methods, but rather to highlight a number of well-known sources and compare the suggested directions outlined in each.

Jean-Baptiste Arban – *Complete Conservatory Method for Trumpet*

J. B. Arban’s method is arguably one of the most in-depth and influential sources in the history of trumpet pedagogy. Comically referred to as the “trumpet Bible” among students, this method was first published in 1864 and continues to be used in brass studios throughout the world. Including pages of nearly every possible technical and musical demand, Arban took great care in crafting a rather lengthy preface to his collection of technique exercises, short melodies, and characteristic studies. In the English translation from the 1982 edition by Edwin Franko Goldman and Claude Gordon, the preface specifically states Arban’s opinion that trumpeters should use the articulation “tu” for proper tone production during single-tonguing (often striking with just the tip or blade of the tongue) and “tu-ku” for double-tonguing (alternating between tonguing with the tip/blade of the tongue and the middle of the tongue body striking the roof of the

mouth). Arban even goes so far as to stress that other articulation patterns are inferior, giving examples of “ta-da,” “ta-de-de,” and “te-ta” for incorrect single-tonguing and “ta-de-gue-da” for incorrect multiple tonguing.⁸

Claude Gordon – *Tongue Level Exercises for Trumpet*

A student of Herbert L. Clarke, Claude Gordon’s technical method books have significantly added to pedagogy in the trumpet community. His book *Tongue Level Exercises for Trumpet* is designed to aid students in understanding the role of tongue movement throughout the various registers of the trumpet. The opening of Gordon’s preface states:

“One of the most vital elements of playing a brass instrument is the tongue. If you did not have a tongue, you would be unable to produce more than one tone. It is the tongue that channels the pitch, just as in talking the tongue shapes the different sounds of the syllables.”⁹

In addition to discussing the movement of the tongue, Gordon also appears to advocate the technique commonly referred to as “anchor tonguing” or “dorsal tonguing.” His preface states:

“Place the tip of the tongue against the back of the lower teeth, *lightly, not rigidly*. Keep the tip there. Play the following exercise. Notice the movement of the tongue...The center of the tongue (not the tip) is now striking behind the upper teeth.”¹⁰

Gordon then goes on to state that this technique is also advocated by Herbert L. Clarke in his *Characteristic Studies* published in the early 1900s.¹¹

⁸ Arban, Jean-Baptiste. *Complete Conservatory Method for Trumpet* (New York: Carl Fischer Inc., 1982), 8.

⁹ Gordon, Claude. *Tongue Level Exercises for Trumpet* (New York: Carl Fischer Inc., 1981), 2.

¹⁰ Ibid.

¹¹ Ibid.

In a separate note regarding this tonguing technique, it may be more accurate for brass players to utilize the term “anchor tonguing” rather than “dorsal tonguing.” The term “dorsal” refers to the “dorsum” or body of the tongue (points of articulation shown in Figure 2.1). Many use these terms interchangeably when referencing spatial regions of the tongue, however, in the text *Articulatory Phonetics*, Brian Gick et al. make a distinction in this area of the tongue. The authors discuss the types of “constrictions” made by the tongue, causing impedance in the air stream, which helps distinguish between various vowels and consonants. This text divides the tongue body/dorsum area into two sections, the anterior portion being the “body” (antero-dorsum) and the posterior as the “dorsum” (postero-dorsum). The authors state that “dorsal” constrictions can occur as far back as the uvula and the soft palate.¹² As many wind players will know, an articulation placed as far back as the soft palate (known as the “velum” in phonetics) would be nearly impossible to produce with a clear articulation and good quality of sound on most instruments, although glottal articulations are known to be used by some instrumentalists on very low pitches.¹³

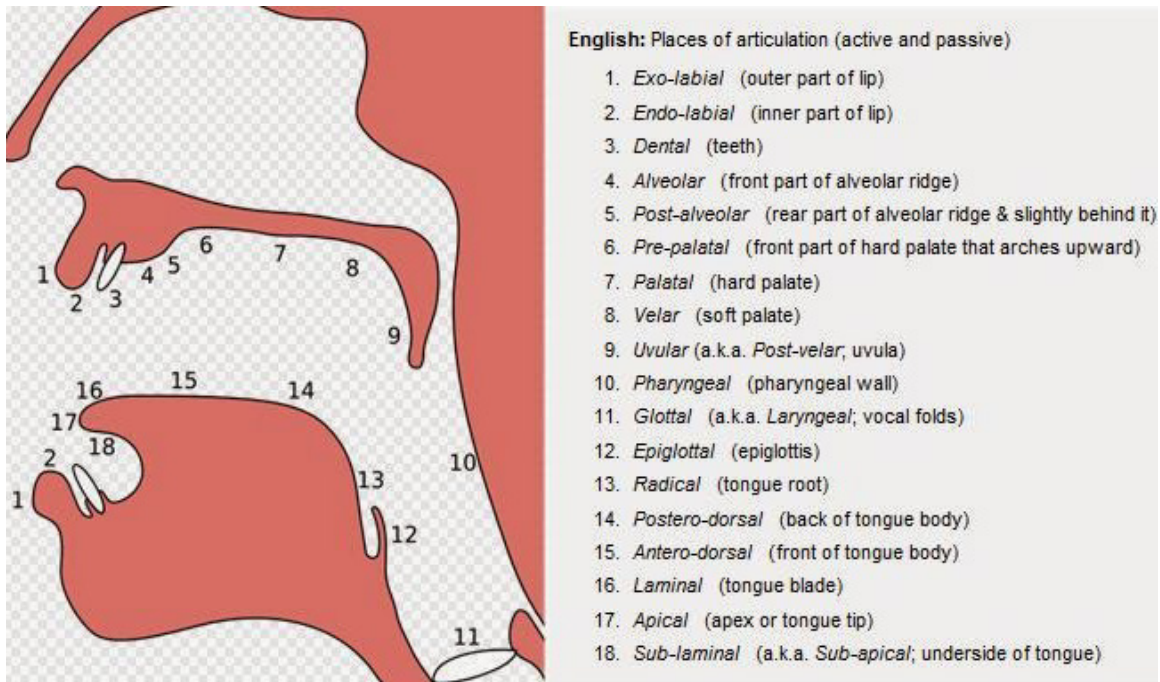
Due to this distinction in sections of the tongue, the term “dorsal tonguing” may be less accurate than the term “anchor tonguing,” which involves the tongue tip remaining behind the front teeth for articulation purposes. Some brass teachers may have an aversion to the term “anchor tonguing,” due to the nature of the word “anchor,” which

¹² Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), 179.

¹³ Douglas Yeo, “Seeing the Unseen: Trombone Playing Through the Eye of a MRI Scanner with the MRI Brass Repository Project,” *The Last Trombone*, August 22, 2017, accessed October 18, 2017. <https://thelasttrombone.com/2017/08/22/seeing-the-unseen-trombone-playing-through-the-eye-of-a-mri-scanner-with-the-mri-brass-repository-project/>.

implies a lack of freedom. To remedy the phonetic and pedagogical issues with both of these terms, it may prove beneficial to view the graphic in Figure 2.1, which displays the possible points of contact between the tongue and oral cavity. After one reviews this model, a better term for “anchor tonguing” may be “laminal-alveolar” tonguing, as the “laminal” portion, or “blade,” of the tongue often strikes some portion of the alveolar ridge (convex, ribbed area behind the top teeth) when attempting this form of articulation. It is also possible that a “laminal-dental” articulation is occurring, if the blade of the tongue contacts the upper teeth. In the graphic in Figure 2.1 on the following page, the portion of the tongue making contact would occur between reference points 15-16, while the contact on the teeth or alveolar ridge would occur between points 3-5. This articulatory placement is not a main focus of this research, nor is it being analyzed in a conclusive nature during this particular study, but is rather a suggestion for further research in both the brass and phonetics communities.

Figure 2.1 – Model displaying points of contact between the tongue and portions of the oral cavity. (<http://conlang101.blogspot.com/>)



In addition to Claude Gordon’s technical discussion of the tongue, another interesting aspect of his preface to *Tongue Level Exercises for Trumpet* presents itself. Following the original English edition, the preface of the book has been translated to German, French, and Spanish. It is unknown to the researcher if these translations were approved/overseen by Gordon or if the publishing company, Carl Fischer, added the translations without approval or at a later date. These translations are fascinating, as the vowels indicated by Gordon vary between the translations.

In the English preface, Gordon specifically indicates a slurred octave leap from written C4 to C5 should be performed with the vowels “Taw-Eee-Aw-Eee.” Gordon’s other well-known method book, *Systematic Approach to Daily Practice*, also outlines

similar vowel formations for register changes.¹⁴ The German preface displays the same exercises as “Ta-I-A-I.” The French preface shows “Tâ-I-Â-I.” These translations appear to be as similar to the English vowels as possible, although there are slight variations in these vowels between the languages from a phonetic standpoint. Interestingly, the Spanish translation is very different from the English, German, and French. The Spanish preface displays “To-I-O-I.” This seems to be quite an interesting choice, as the Spanish language does in fact employ variations of the /a/, /ɑ/, or /æ/ vowels (generally pronounced “ah”), yet this sound was not indicated by the translation. From a phonetic analysis, variations of the “ah” sound are considered to be some of the lowest or most “open” vowels produced, but vary in placement from front, central, or back in relation to the oral cavity. In comparison, the /o/ or /ɔ/ vowels (generally pronounced “oh”) are placed in the back of the oral cavity, but range from open-mid to close-mid, which is higher in the mouth than the family of “ah” sounds. The following International Phonetic Alphabet chart in Figure 2.2 displays the placement of these vowels and Figure 2.3 gives English words as a reference for the pronunciation of each vowel in context.

¹⁴ Claude Gordon. *Systematic Approach to Daily Practice for Trumpet* (New York: Carl Fischer Inc., 1965), 6.

Figure 2.2 – The International Phonetic Alphabet (IPA) vowel placement chart. (<https://www.internationalphoneticassociation.org/content/full-ipa-chart>)

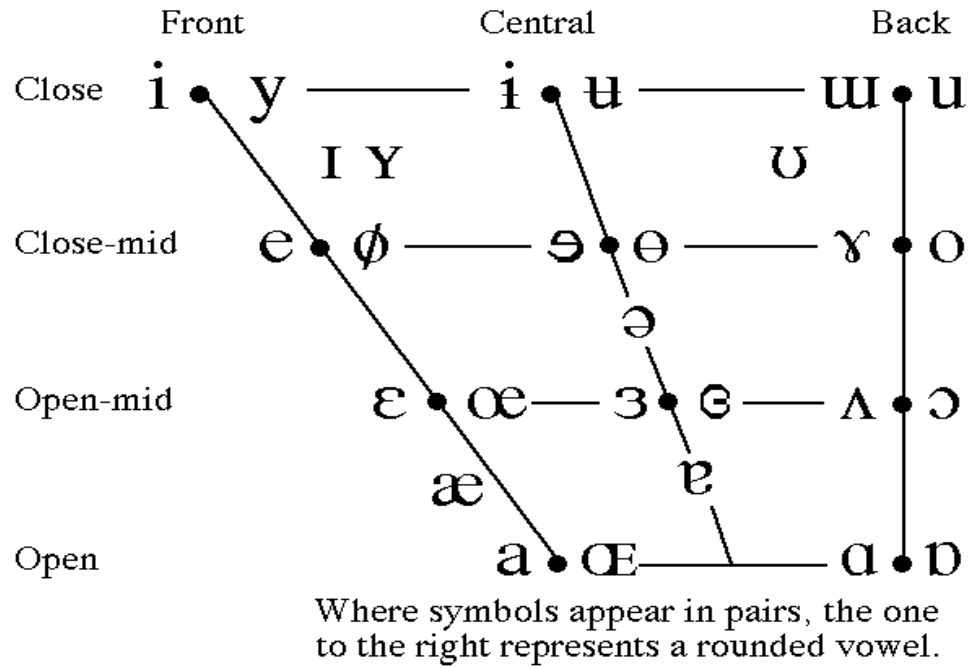
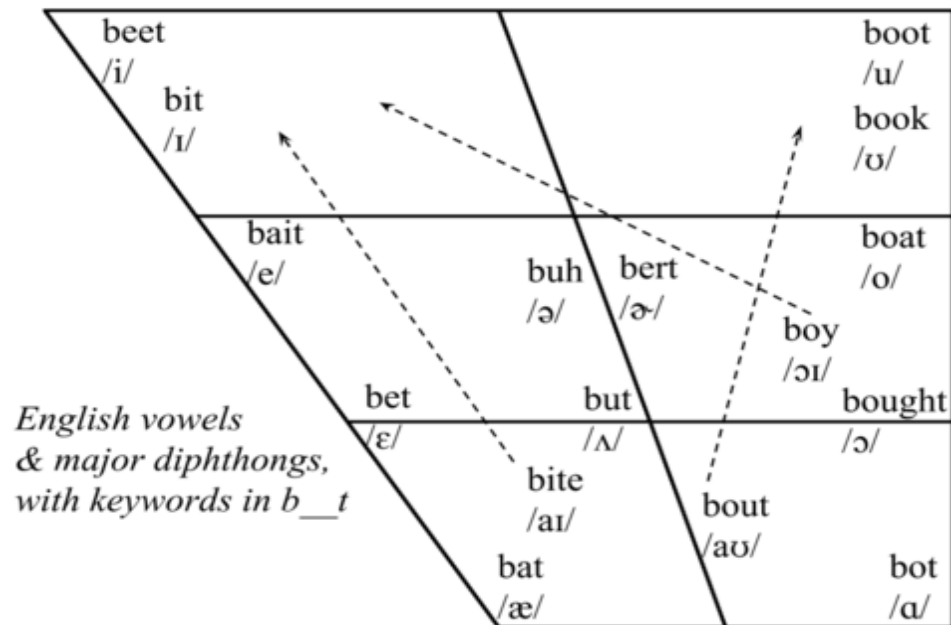


Figure 2.3 – The IPA vowel placement chart with English words for pronunciation reference. (<https://www.speechmodification.com/online-practice-free-trial/how-to-pronounce-american-english-vowel-sounds>)



Earl Irons – *Twenty-Seven Groups of Exercises for Cornet and Trumpet*

In an approach similar to that of Claude Gordon, the well-known method *Twenty-Seven Groups of Exercises for Cornet and Trumpet* by Earl Irons advocates the tongue position of “ah” for low notes and “ee” for higher notes. Irons also adds drawings of the oral cavity, which display a low, concave tongue position for “ah” and a high tongue position for “ee.”¹⁵

Richard Shuebruk – *The Complete Shuebruk Tongue Trainers for Trumpet*

Another widely used method, Richard Shuebruk’s *The Complete Shuebruk Tongue Trainers for Trumpet*, not only discusses single tonguing, but also the syllables used for double-tonguing and triple-tonguing. Shuebruk states: “For double and triple staccato we must practice using the back part of the tongue as fluently as the tip. The tip of the tongue uses the syllable “tu,” and the back of the tongue uses “ku.”¹⁶ Shuebruk’s approach is very similar to that of J. B. Arban, but more specifically indicates placing the “ku” syllable at the back of the tongue. As previously mentioned in the discussion of the term “dorsal tonguing,” referring to this portion of the tongue as the “back” may be slightly inaccurate in phonetic analysis.

Victor Salvo – *240 Double and Triple Tonguing Exercises*

In another innovative discussion of multiple tonguing, Victor Salvo’s *240 Double and Triple Tonguing Exercises* gives a very detailed set of preliminary exercises to master the concept of multiple tonguing before playing the trumpet. Salvo outlines a ten-

¹⁵ Earl Irons. *Twenty-Seven Groups of Exercises for Cornet and Trumpet* (San Antonio: Southern Music Co., 1938), 3.

¹⁶ Richard Shuebruk, *The Complete Shuebruk Tongue Trainers for Trumpet* (New York: Carl Fischer Inc., 1925), 14.

step process, which begins with setting a metronome to 60 beats per minute and whispering “KU” on each beat. Another step involves speaking “KU” aloud. Salvo states, “You will notice that it is a little more difficult to say the syllable “KU” out loud than it is to whisper it.”¹⁷ This is one of the only resources found during this research that delineates the difference between voiced speech and a whisper, which is likely intended to more accurately represent the sensation of playing the trumpet with an unvoiced formation in the vocal tract. Salvo then adds the suggestion of “TU-KU” on a whispered air stream, then directs the student to do the same pattern blowing air through the mouthpiece. The final preliminary steps involve whispering “TU-KU” while buzzing into the mouthpiece, then finally adding the trumpet to create the desired tone.¹⁸

John O’Reilly and Mark Williams – *Accent on Achievement*

As an example of a method book intended for beginning students, *Accent on Achievement* by John O’Reilly and Mark Williams is intended for use by individual instruction as well as with an entire beginning band. In the preface under the title “Producing Your First Tone,” the authors indicate using the syllable “Tah” to produce the first buzz on the mouthpiece.¹⁹

John O’Neill and Steve Waterman – *The Jazz Method for Trumpet*

Outside of the realm of the above classical and beginning methods, *The Jazz Method for Trumpet* by John O’Neill and Steve Waterman advocates utilizing a “doo”

¹⁷ Victor Salvo, *240 Double and Triple Tonguing Exercises* (Van Nuys, CA: Alfred Publishing Company, 1969), 3.

¹⁸ Ibid.

¹⁹ John O’Reilly and Mark Williams, *Accent on Achievement (Bb Trumpet)* (Van Nuys, CA: Alfred Publishing Co., 1997), 4.

articulation. The authors also direct the student to first sing a pitch using “doo,” then producing a note on the trumpet in the same way. At the end of the preface, the authors then introduce the “too” syllable as an alternative for producing a “harder attack.”²⁰

²⁰ John O’Neill and Steve Waterman, *The Jazz Method for Trumpet* (London: Schott & Co. Ltd, 1995), 18.

CHAPTER THREE

REVIEW OF PREVIOUS STUDIES AND ARTICLES

While there is significant literature within the individual fields of phonetics and brass playing respectively, there are a select few studies that directly assess the relationship between these specific fields. The journal article by Robert F Noble, “Review: The Relationship of Syllables to Pitch and Tonguing in Brass Instrument Playing,” is an observational study with relevant data from college band directors in the 1960s. This data was collected by Dr. Lewis Edward Hiigel by surveying educators at the 1967 College Band Directors National Association. Hiigel’s survey specifically asked directors which speech syllables were most commonly used in teaching various articulations on brass instruments. Noble’s review states the following:

Eighty-seven percent of the respondents indicated they used syllables in teaching articulations and that, in the four registers (low, medium-low, medium high, and high), the most commonly used staccato syllables were “taw,” “tah,” “too,” and “tee.” Most frequently used legato syllables were “daw,” “dah,” “doo,” and “dee” in the same four registers.²¹

Additionally, Hiigel performed x-rays on six brass players, including two trumpet players. First, the participants played the written score with no instructions. Next, subjects spoke indicated syllables from a script. Finally, participants played the written music and were instructed to “think” of using the syllables while performing. Hiigel discovered ten conclusions from this research, the most significant of which for the

²¹ Robert F. Noble, “Review: The Relationship of Syllables to Pitch and Tonguing in Brass Instrument Playing.” *Bulletin of the Council for Research in Music Education*, no. 18 (1969): 44.

purposes of this research was that the method of “thinking” of creating a syllable in the oral cavity during playing had no noticeable effect.²²

In a related study, Paul Budde’s PhD thesis “An Analysis of Methods for Teaching Middle School Band Students to Articulate” outlines the various directives given to young students to articulate on wind instruments. In the study, Budde pared the data pool down to three main groups of seventh-grade band students, each given a different method of instruction regarding articulation. The first group included students that were given a written “articulation guide” containing information about the oral cavity, including a computer-generated graphic showing the tongue in the oral cavity. The guide also advocated the use of “TAH” to begin a note and even contains information about phonetics and uses IPA vowels in conjunction with the more common spoken directive.²³ The second group was a “practice group,” in which students regularly practiced articulation exercises during band rehearsals. The third group was deemed the “audio group,” in which the students were exposed to recordings of articulations modeled by professionals playing the same exercises given to the students.²⁴ The analysis of data concluded that the written “articulation guide” group had the lowest performance on the articulation exercises. While there was not a significant statistical difference between the “audio group” and the “practice group,” both of these performed at a higher level than those given the articulation guide.²⁵ This conclusion is important for the author’s current

²² Robert F. Noble, “Review: The Relationship of Syllables to Pitch and Tonguing in Brass Instrument Playing.” *Bulletin of the Council for Research in Music Education*, no. 18 (1969): 45.

²³ Paul Budde. “An Analysis of Methods for Teaching Middle School Band Students to Articulate” (PhD diss., University of Minnesota, 2011), 276.

²⁴ *Ibid*, iv.

²⁵ *Ibid*, 234.

research, as it suggests that written directives were not as effective of a tool in teaching articulation. While the current research topic discusses vowels more specifically than articulations, all of the aforementioned method book prefaces display detailed written instructions on vowels and articulation, yet Budde's research proves this to be rather ineffective within the scope of his study.

One other study relating linguistics and brass playing was performed by Mathias Heyne and Donald Derrick and presented in a conference paper, "Trombone Players Seem to Use Different Tongue Positions While Playing Sustained Notes, Depending on Their Native Languages." The authors begin by highlighting previous research, including the ways in which a performer's first language affects performance on the trombone. The study involve six amateur to professional trombone players, three of which were native New Zealand English speakers, one native speaker of Tongan (South Pacific origin), one Japanese, and one Mexican Spanish. Using ultrasound technology, the researchers found that these players did in fact have different tongue placements while playing specific pitches and these differences appeared to correlate to native language.²⁶

Another notable study referenced in the paper by Heyne and Derrick is a 2014 dissertation by Katie A. Cox, which compares speech and trombone playing between American English and British English speakers. One interesting conclusion found that listeners were unable to determine the nationality of various recorded performers playing the same piece of music, yet when asked which interpretation they preferred, participants

²⁶ Mathias Heyne and Donald Derrick, "Trombone Players Seem to Use Different Tongue Positions While Playing Sustained Notes, Depending on Their Native Languages." Paper presented at Ninth Triennial Conference of the European Society for the Cognitive Sciences of Music (ESCOM), At Manchester, England, August 2015.

more often chose the recordings by performers of their same language background.²⁷

While the research of Cox, Heyne, and Derrick discusses differing native languages, the finding that tongue positions noticeably vary among performers is relevant to this current research.

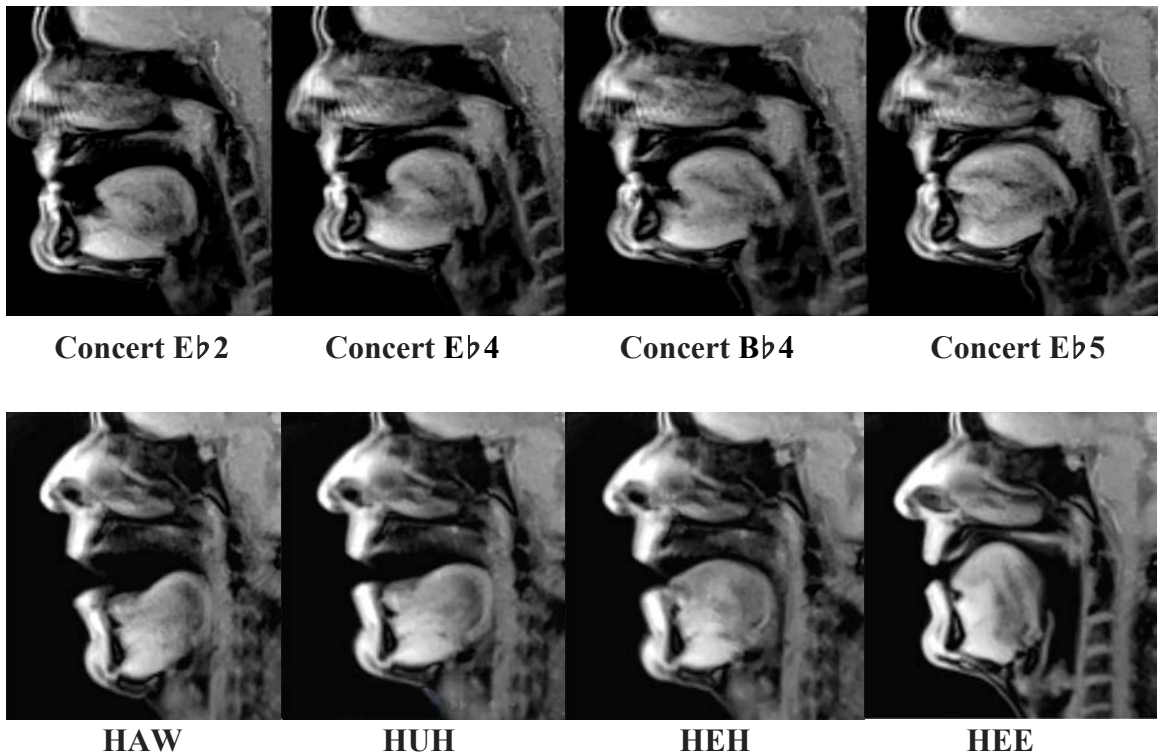
In further recent data, various instrumentalists and researchers have utilized MRI technology to view the oral cavity and throat while performing. In February 2018, *The Horn Call* published an article by Dr. Peter Iltis, Professor of Horn and Kinesiology at Gordon College, and Eli Epstein, former Second Horn of the Cleveland Orchestra and Professor of Horn at New England Conservatory. The article focuses on a study the two authors performed, in which a professional plays various pitches and exercises on the horn and later speaks the specific vowels of “HAW,” “HUH,” “HEH,” and “HEE” in a sustained manner while the images are captured via MRI. This article then compares the performer’s tongue positions during the playing of pitches on the horn within the ranges deemed “low, middle, middle-high, and high.” The article reaches the conclusion, “the tongue positions for playing in these ranges are remarkably similar to the positions that occur in speaking these syllables, though the tongue is in a more retracted position when compared to speaking.”²⁸ Figure 3.1 displays the MRI images of playing and speaking taken from a singular performer during the study. Epstein then uses this data to explain his use of vowels to teach register changes and breathing to his horn students by utilizing such corresponding vowel positions. This is in direct contradiction of the previous study

²⁷ Katie A. Cox. “Connections Between Linguistic and Musical Sound Systems of British and American Trombonists” (PhD diss., The University of North Carolina at Greensboro, 2014).

²⁸ Peter Iltis and Eli Epstein. “MRI Horn: Brass Pedagogy Informed by Science!” *The Horn Call* (February 2018): 44.

by Hiigel (1967), in which the researcher concluded that a performer “thinking” of using a particular vowel while playing had no noticeable effect upon performance.

Figure 3.1 – Saggital (side) view of oral cavity while playing four pitches in low, middle, middle-high, and high registers on the horn. Compared to speaking four vowels of varying tongue heights. (MRI images courtesy of Peter Iltis and Eli Epstein)²⁹



This particular study by Iltis and Epstein is an important resource and reaches other important conclusions regarding successful breathing and performance on a brass instrument. When viewing the images from this study, however, it is important to consider that the spoken syllables shown during the MRI are not formed in the context of natural speech patterns, but are rather isolated vowels prompted to the speaker in some way by the researcher. This invites the possibility that the speaker would normally use

²⁹ Peter Iltis and Eli Epstein. “MRI Horn: Brass Pedagogy Informed by Science!” *The Horn Call* (February 2018): 44.

those vowels in a different manner during natural speech, such as within words used in his/her native language. This caveat is important for this author's current research, which aims more specifically to compare brass playing to natural speech patterns found in the English language.

Additionally, in terms of the specificity utilized in phonetic analysis of vowel placement, tongue positions displayed in this study during speaking and playing may not appear as similar as initially indicated, especially to the trained eye of a phonetician. While visualizing these vowel positions may be a valuable pedagogical tool and aid a student in tone production on the horn, the data produced shows significant variation between the spoken vowel and the corresponding register of pitches referenced during the study. Specifically, the first images of each set in Figure 3.1 (E♭² as compared to the vowel "HAW") look remarkably different in not only the contour of the tongue surface, but also in the amount of retraction created by the tongue root. During the spoken vowel "HAW," the antero-dorsum (front portion of the tongue body) is visibly concave and the apex (tip) is nearly touching the bottom front teeth. In the corresponding image of "E♭²" (nearly two octaves below "middle C"), the antero-dorsum is no longer in a concave position and the apex of the tongue is quite retracted from the bottom front teeth. The remaining corresponding images of playing and speaking can be analyzed in the same manner. If one were to determine which images appear the most alike in tongue shape and retraction, it appears that the vowel "HEH" is the most similar to the images of horn playing, especially when comparing the overall height of the tongue body and the small amount of retraction shown in the "E♭⁵ Concert" image. In further variables, the head/neck positions shown while speaking and playing appear to be quite different in the

images taken from this specific performer. Such a position change could significantly vary the shape of the tongue between performance and speech.

After reviewing previous studies, it is clear that many researchers are interested in how language affects and is related to brass playing. The study most similar to the current research is the Heine and Derrick study, as the researchers were able to link the variations of tongue positions for sustained notes in players of different native languages. However, this study involved six participants with four different native languages among the data pool, making it difficult to determine if this is consistent throughout larger cross sections of these populations.

CHAPTER 4

EXPERIMENTAL DESIGN AND DATA COLLECTION

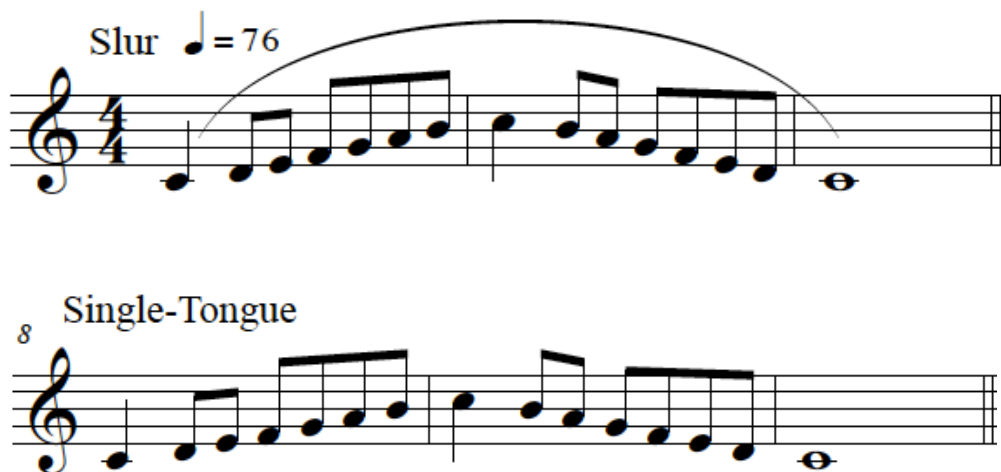
Experimental Design

At present, the limited number of known research studies relating the pedagogical use of phonetics in the brass community indicates a wide chasm in the understanding of the specific relationship between the two fields. It is clear from the previous review of articles and method books that many brass teachers and researchers are interested in tongue placement and many have used speech to convey these concepts for decades. This information then leads to the following questions: 1) Can tongue movements during speech relate to those made during trumpet playing? 2) Are the specific vowel formations referenced in various method books utilized while producing sounds on the trumpet? 3) If so, which vowels are utilized and do these correspond to particular pitches or registers on the instrument? To answer these questions, the following interdisciplinary experiment was designed to provide observational data for both the linguistic and brass communities.

Before beginning data collection, it was necessary to determine the exact exercises to be performed during the trumpet-playing portion of the study. As the goal of the research was mainly to observe any and all phenomena, the list of exercises was designed to be as thorough as possible, in hopes of identifying further hypotheses and observations not previously identified. The exercises were to be played only on the B-flat trumpet and ranged from the lowest note on the instrument, written F-sharp (concert E-natural), to written C-natural (concert B-flat) above the staff (“E3” to “B♭5” in ASA pitch labels). The exercises were designed to display many facets of playing in various registers within a defined range, including slurring, single-tonguing, double-tonguing

(using the tongue to quickly alternate between contacting the front of the mouth and the hard palate), lip slurs (utilizing only the open partials of the trumpet without depressing any valves), and using the lips alone to begin a note without the tongue (commonly known as “poo” attacks). This list of exercises was intended to be as comprehensive as possible, without including tasks that would be considered unmanageable by a majority of trumpet players. These exercises were also given a tempo indication as a suggestion of a tempo range but a metronome was not used, in the event that some players would not be capable of performing particular tasks at specific tempos. Not all exercises were utilized for analysis and the span of techniques required for the list of exercises were intended to keep the participant from assessing a pattern or attempting to determine the analytical goals of the study. See Figure 4.1 for an example of the format of the trumpet exercises. The full exercise list is attached in Appendix A.

Figure 4.1 – Example of the first two trumpet exercises performed by participants.



In addition to trumpet exercises, the study also utilized a list of English words to be read while ultrasound data was collected. This word list (Figure 4.2) is designed to incorporate many different vowel and consonant pairings, the majority of which are single-syllable words that all occur within the English language. While words from other languages or words created using so-called “nonsense syllables” could have been used to find other vowel and consonant pairings outside of identifiable English words, this study specifically aims to compare trumpet playing to natural speech patterns found in the English lexicon. This is an important distinction, as the author wished to have participants pronounce these words as naturally as possible and without hesitation. The words were then placed in a randomized order to deflect the participant from associating any patterns and the word order remained the same for each participant. In addition to single-syllable vowel and consonant pairings, the researcher also included words such as “arrow,” “purr,” “eerie,” and “aura” to determine each participant’s pronunciation of the /ɹ/ consonant. This data was not used for this particular research, but merely for observation and possible future research questions regarding “retroflex” and “bunched” tongue positions for /ɹ/.

Figure 4.2 – Word list spoken by each participant in exact order as shown. Words listed on-screen and displayed and recorded separately.

Hay, sue, shy, zoo, show, pie, arrow,
bee, so, pew, lie, doe, lay, hue, hoe,
sigh, purr, dew, say, chew, high, knee,
eerie, poe, too, day, pee, low, cue, die,
lee, shoe, wee, woe, tie, cay, toe, pooh,
she, foe, way, aura, by, sea, who, tea,
coo, key, pay, do, fee, loo, he, boo

Data Collection

After obtaining approval from the University of Kentucky (UK) Institutional Review Board, data was collected from 12 subjects over 18 years of age in a timespan of approximately two weeks. Participant ages ranged from 18 to 38. To narrow the pool of data in relation to vowel formation, the subject pool was limited to native English speakers of varying dialects. The experiment was conducted in the UK Phonetics Lab at the and overseen by an experienced phonetician. A sound-attenuated booth was utilized to reduce ambient noise during data collection. While other researchers have viewed the oral cavity of musicians using cinefluorography and MRI technology, ultrasound imaging is most commonly used in phonetics research. It is also one of the safest and least invasive technologies, as well as one of the least expensive methods, making it the most suitable technology for data collection in this research.³⁰ This particular study utilized the EchoB model of ultrasound machine. To allow as much comfort and range of motion as possible, subjects were fitted with an adjustable, lightweight aluminum headset. Figure 4.3 displays the headset alone and Figure 4.5 shows the author wearing the headset while playing trumpet.

A small ultrasound transducer or “probe” (shown in Figure 4.4) was then attached to the headset under the participant’s chin, where it pressed lightly on the skin of the flesh found directly under the tongue (also visible on the researcher in Figure 4.5). During the design phase of the experiment, the researcher personally attempted performing with the transducer attached to an adjustable microphone stand with a moveable arm and also with another researcher holding the transducer under the chin.

³⁰ Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), 162

Figure 4.3 – Front view of aluminum headset.



Figure 4.4 – Ultrasound transducer.



Figure 4.5 – Author playing trumpet with headset. Transducer attached under chin.



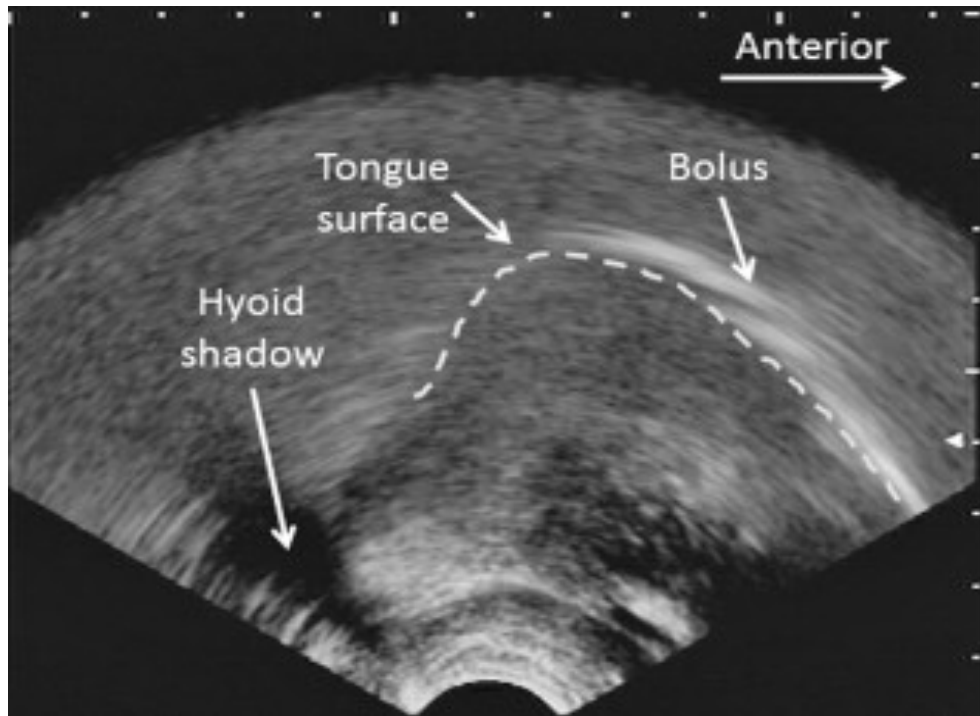
The researcher found that utilizing the aluminum headset was a significantly more useful option than the adjustable microphone stand or hand-held by another researcher. The headset allowed for more movement during breathing and gave the performer a more natural range of motion, keeping the transducer stable during any natural pivots of the head and neck while playing. When fitting the transducer to each participant, the researcher placed ultrasound gel directly on the transducer, to create a smooth bond between the transducer and the skin. Without gel, tiny air pockets can form between the transducer and the skin, disrupting the ultrasound waves and reducing image quality. The experiment utilized Aquasonic gel by Parker Laboratories, Inc., composed mainly of propylene glycol and water. For audio data, a small clip-on microphone (Audio-Technica 831 model) was then attached to the headset to record both trumpet-playing and speech data. The researcher later used audio data to determine the specific pitch played during the corresponding segments of the ultrasound video.

After adjusting the headset and fitting the transducer to each participant, the author utilized the software “Articulate Assistant Advanced” (AAA) to view the oral cavity and collect and analyze data. This software gives a midsagittal (side) view of the oral cavity in real-time and allows for simultaneous recording of the ultrasound video with the audio recording of the trumpet exercises and speech. Between participants, the researcher found it necessary to adjust the viewing settings to gain a clearer image of the tongue and oral cavity. This was especially important, as participants varied widely in head and oral cavity measurements, which drastically changed the image produced by the ultrasound software. The goal of manipulating the technological settings was to unify the field of view in the oral cavity from participant to participant as much as possible. This

allowed for a more uniform analysis after data was collected. An important note regarding the recording of ultrasound data: ultrasound technology is incapable of recording images through bone. Within the portion of the oral cavity utilized in phonetics, several bones are within the field of view, including the front teeth and jawbone, the hard palate at the roof of the mouth, and the hyoid bone at the back of the oral cavity. These bones are shown as dark grey or black patches in the ultrasound image and give a frame of reference when determining the appropriate field of view and depth settings for each participant.

The limitations of viewing through air pockets using ultrasound technology make it nearly impossible for researchers to distinguish the hard palate (roof of the mouth) from the air above the flesh of the tongue. This entire region of air often appears dark grey or black, much like the bone itself. In phonetics, however, it is necessary that researchers know the exact location of a participant's hard palate, as it is the only way to determine the tongue height of each vowel and various articulatory placements of the tongue. Due to this lack of clarity in the image, it is necessary in phonetics research to have each participant swallow a liquid before speech data is collected. The purpose of this procedure is to fill the air space in the oral cavity with a liquid, which, unlike air, the ultrasound can distinguish from bone. As the participant holds the water in the mouth and then swallows, the ultrasound is able to capture a clear outline of the tongue and roof of the mouth as the liquid passes under the flesh covering the hard palate. This image is then used during the analysis process and allows the researcher to map a line for the roof of the mouth, giving more precise measurements of vowels and the articulatory placements of the tongue. A labeled image from a published study is displayed below in Figure 4.6.

Figure 4.6 – Ultrasound image of participant swallowing water. The right side of the image is the anterior (front) of the oral cavity. The dark shadow of the hyoid bone is seen the lower left of the image. The tongue surface is shown as a dashed line, and white area above the tongue surface is the bolus (pocket of water) as it enters the mouth. (Source: https://www.researchgate.net/figure/A-Sagittal-View-B-Mode-Ultrasound-View-Taken-with-the-Transducer-Placed-Beneath-the_fig2_268691403).



In this study, subjects swallowed water for the above purpose while the ultrasound machine collected video data. This process took place before subjects played exercises on the trumpet, and was repeated one additional time after playing and before reading the word list, to ensure accuracy. Subjects were asked to play the list of musical exercises on their own personal trumpet in the key of B-flat. The exercises were shown as individual images on a computer screen using the AAA software program (shown in Figure 4.7). The playing of these exercises was audio recorded while the video of the ultrasound display was simultaneously recorded, with the researcher controlling the start

and stop of each recording using the program interface. While still monitored by the ultrasound, subjects then read the list of English words, which were displayed as individual words on the computer screen and recorded as separate events, controlled by the researcher in the same manner (shown in Figure 4.8). The reading of this word list was also audio recorded simultaneously with the ultrasound video recording, showing vocal tract movement during speech.

Figure 4.7 – Screenshot of user interface during data collection of trumpet exercises

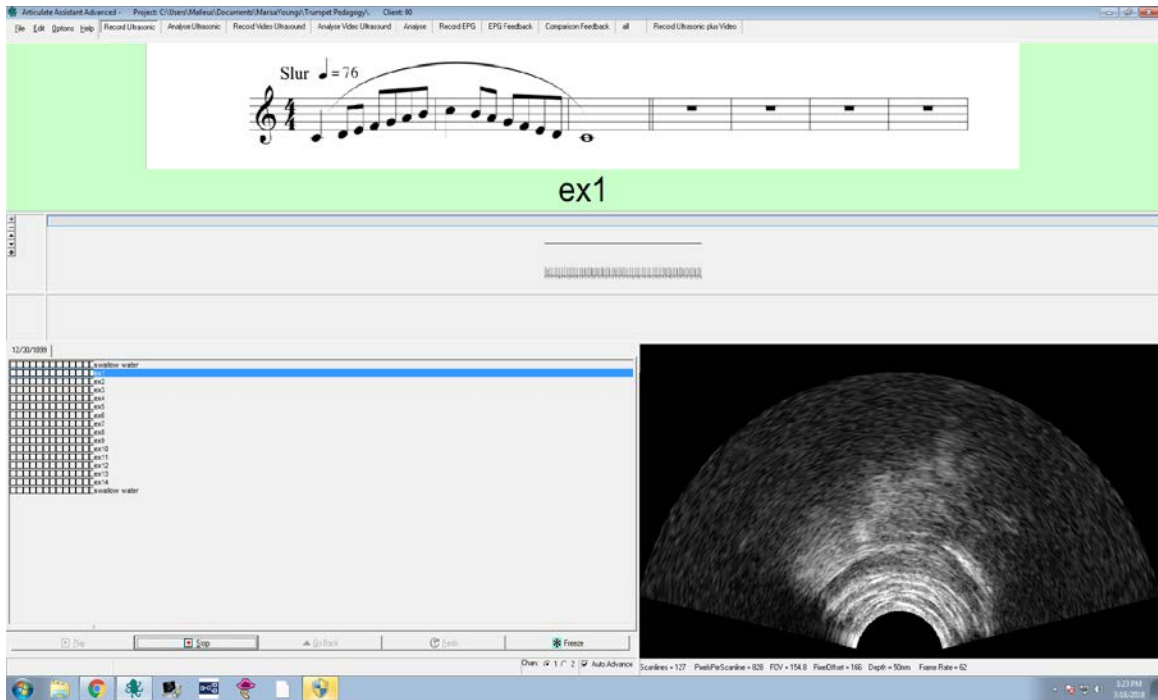
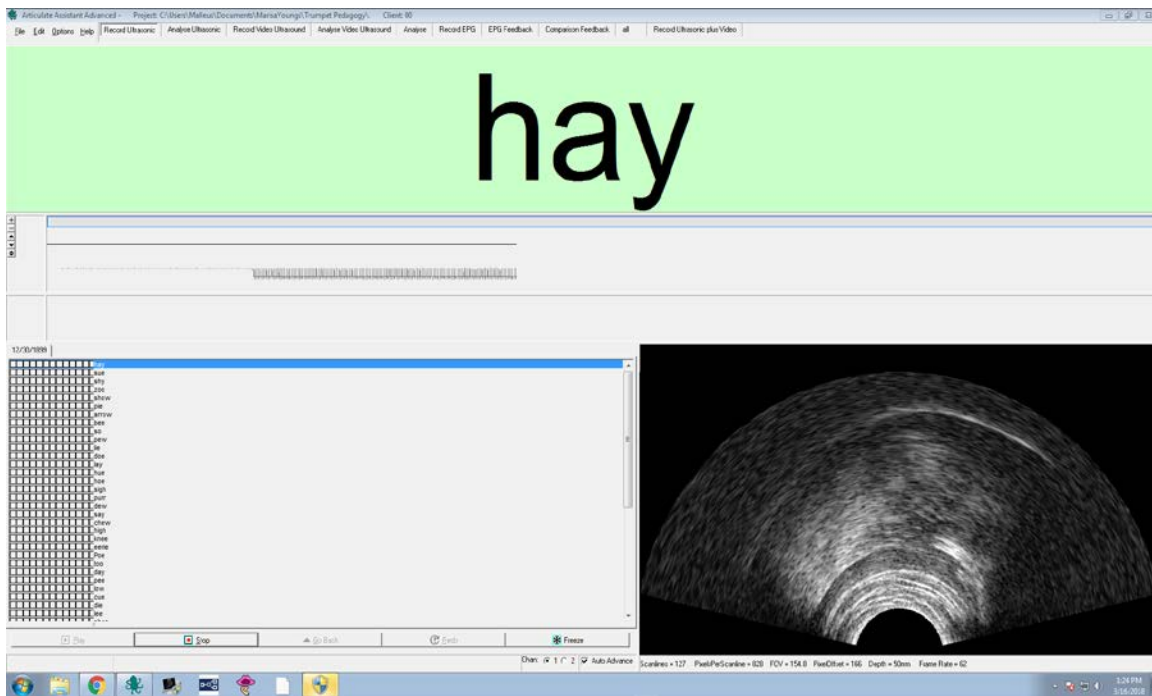


Figure 4.8 – Screenshot of user interface during data collection of word list.



Data Collection Problems

During the data collection process, several problems were encountered by the researcher. As mentioned above, the aluminum headset used in this study had significant advantages over the other modes of securing the transducer. In some cases, however, the headset was difficult to fit to several participants. In participants with head measurements nearing the very large or very small ends of the size spectrum, it proved difficult to fit the headset at the appropriate angle for the transducer to collect the proper field of view in the oral cavity. The researcher fixed this issue by placing small pieces of foam in the clamp area that holds the transducer under the chin. The foam pieces gave another level of adjustment to the angle of the transducer, making data collection more reliable on participants of various sizes.

Another related issue was encountered with participants that had varying amounts of flesh under the chin. More flesh under the chin creates more interference for the ultrasound, making it difficult to gain a clear view of the oral cavity. Even with a small amount of visible flesh under the chin, some participants appeared to have larger tongue muscles or more flesh in the oral cavity than other participants. Again, this caused more interference in the ultrasound images, making it more difficult to gain a clear image the surface of the tongue and roof of the mouth.

Other problems encountered were equipment or software related. Several times during the experiment, the computer system or AAA software would not recognize either the ultrasound or the audio input. At times, both were recognized, but the software could not synchronize the ultrasound video with the audio. This synchronization was necessary for data collection, as the researcher must utilize the audio to precisely determine the position of vowels or the pitch being played on the trumpet during data analysis. This problem was often fixed with a simple reboot of the computer system, but in other instances required further manipulation of the software drivers. In a further related issue, several instances occurred in which the ultrasound image would freeze or the audio recording would “flatline,” causing the researcher to re-record the particular exercise.

One final consideration in data collection is participant error. Occasionally, participants would play a trumpet exercise incorrectly, either by playing the incorrect rhythm or simply missing pitches while playing. Participants also occasionally began speaking words from the word list too quickly, before the microphone began recording. This was remedied by re-recording that particular excerpt or word, while the previous recording was discarded and not utilized in data analysis.

CHAPTER FIVE

DATA ANALYSIS

Initial Processes

During the experimental design phase, the researcher included as many exercises as possible, in the event new hypotheses may be discovered. The amount of data gathered was significantly more than necessary for this research, creating the need to narrow the scope of the data to be analyzed. To determine which data to analyze, the research questions were referenced, to determine if these questions can be answered by the data:

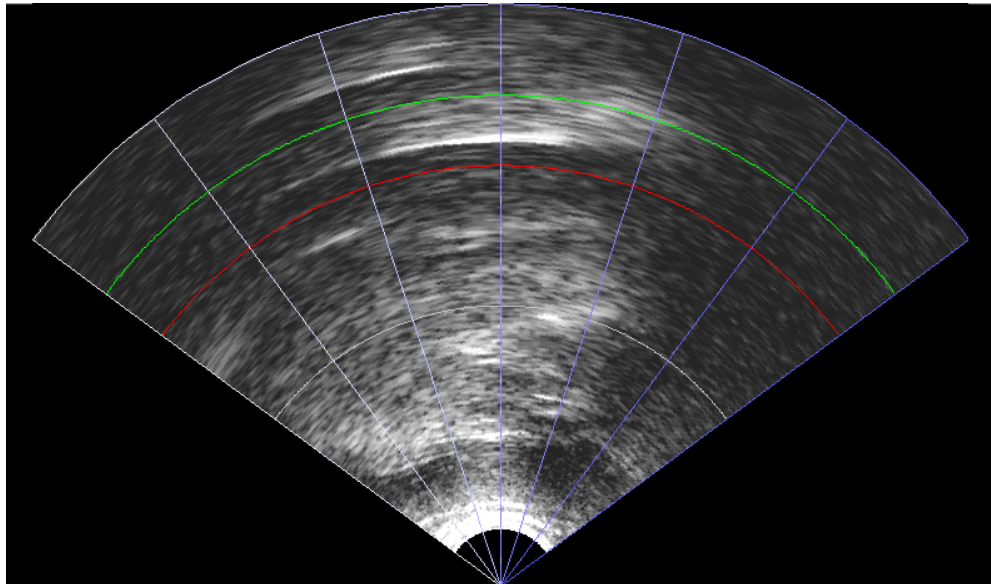
1) What is the relationship between the movements of the tongue during speech as compared to trumpet playing? 2) Are the specific vowel formations referenced in various method books utilized while producing sounds on the trumpet? 3) If so, which vowels are utilized and do these correspond to particular pitches or registers on the instrument?

Related to these questions are the previous chapters, which focused on the specific vowels advocated by some brass teachers, as referenced in method book prefaces and articles. The structure of the article by Peter Iltis and Eli Epstein regarding the use of vowels during horn performance proved to be a beneficial model for this current study, as it compares the vowels thought to be used in various registers on the horn. As participants in the current study played pitches covering the majority of the trumpet's usable register (excluding the extreme upper register), a similar approach was taken by the researcher to assess a correlation between specific vowels and notes within specific registers of the trumpet range.

In addition, the researcher chose a practical approach to analysis, in which only tongue shapes were analyzed. In the initial stages of analysis, the AAA software program

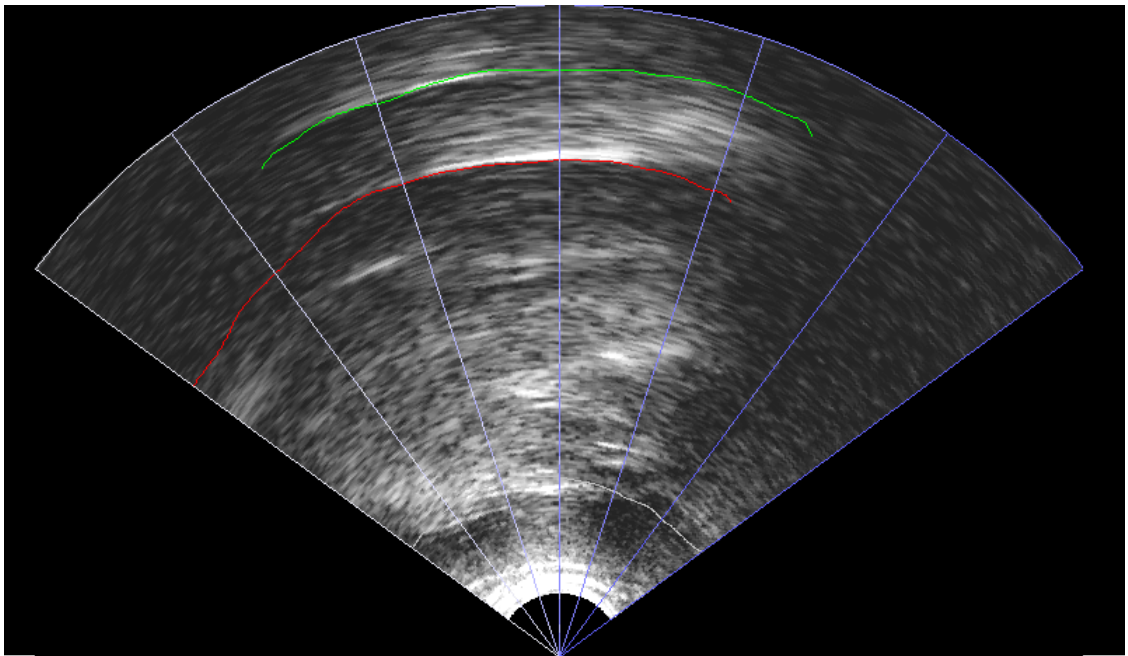
was utilized to map the surface of the tongue, as well as the roof of the mouth and the minimum height (lowest possible point) of the tongue. The program initially displays these height lines as a generic map known as a “fan spline” (shown in Figure 5.1). A fan spline simply creates a fan-shaped grid from which the actual tongue height and roof of the mouth can be mapped. In Figure 5.1, the red, green, and white curved lines are the “splines.” From this basic image, the researcher is able to manipulate the splines into the proper position by selecting an area of the spline and dragging the line into the proper position. This particular image is from the recording of a participant swallowing water. As previously referenced in the discussion of the purpose of swallowing water, the position of the water bolus determines the position of the roof of the mouth, as well as the surface of the tongue.

Figure 5.1 – Initial fan spline created by AAA software program. Image of water bolus positioned above tongue as participant swallows water. Green line – roof of mouth. Red line – tongue surface. White line – minimum tongue height.



In Figure 5.1, it is quite clear that the initial fan spline created by the AAA program does not accurately map the position of the tongue or location of the roof of the mouth based on the visual location of the bolus. The researcher must edit the splines to accurately indicate the actual location of each position in the oral cavity. Figure 5.2 displays an example of the fan spline edited by the author, which was created simply for reference purposes, not analysis of data. The researcher's edited version can then be utilized by AAA to allow the program to map the remaining splines throughout all of the participant's image data, including all trumpet exercises and spoken words.

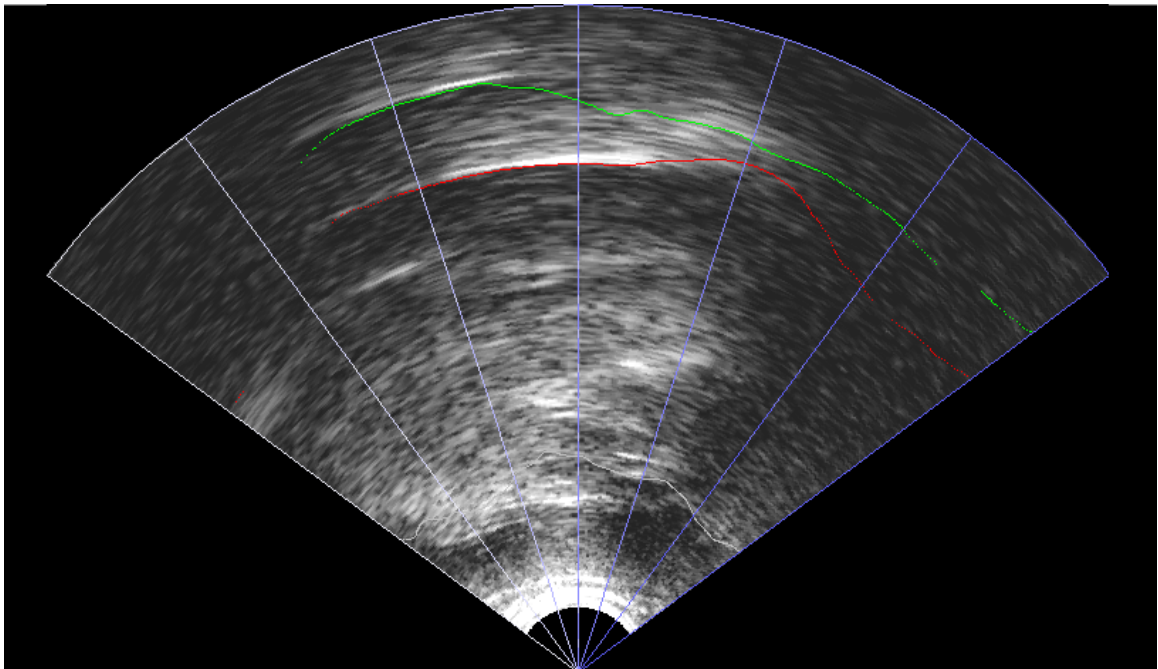
Figure 5.2 – Fan spline edited by researcher. Researcher can choose to edit splines to disregard areas in which splines cannot accurately map the visible area (such as the darker shadows in the posterior and anterior portions of the image, typically indicating air pockets or bone mass).



Unfortunately, the mapping ability of the AAA program was initially less accurate and its use for this research was deemed unnecessary by the author and supporting phonetician. It is unclear if these inconsistencies with the software were due to image

clarity, the program itself, or another issue. An example of the program's attempt at analysis during the same water swallowing recording can be seen in Figure 5.3. This image displays the inaccuracies of the software, specifically noticeable in the green line indicating the spline for the roof of the mouth. The roof of the participant's mouth is the hard palate, an immobile object (unless the ultrasound probe were to be shifted drastically), yet the software's mapping indicates drastic motion of the corresponding spline. Therefore, the mapping of the AAA software appears to be inaccurate. Due to these inaccuracies, the researcher chose to map the splines by hand for the remainder of the data analysis.

Figure 5.3 – Fan spline mapped by AAA software program.



After determining to map the splines by hand, the author found the splines to be much less visible when viewed in the AAA software program. It proved to be much more visible when the spline image was placed in the Microsoft “Paint” program and the spline was traced with a much more visible, highlighted red line. One issue with importing the images to Paint, however, was the ultrasound image quality was slightly reduced. This makes the corresponding Paint images slightly more “grainy” in appearance, but the original image was used by the researcher to visually map each spline. For the purposes of this research, it was determined to be the most beneficial to only map the shape of the tongue surface for data analysis. The roof of the mouth and minimum tongue height were not mapped by the researcher and are not used in the subsequent data analysis. These tongue surface shapes are compared between the images of participants playing various pitches and speaking vowels.

Data Analysis

Out of the 12 participants, four subjects were chosen for analysis, due to the higher quality of the ultrasound images produced. A clearer image has the possibility of a more reliable analysis and more accurate conclusions. For the images analyzed, the researcher adjusted the quality of each image by enhancing the percentages of contrast and brightness displayed. In addition, the depth of the ultrasound image remained the same within all of the data for each participant. However, the depth was often adjusted between participants during data collection, due to the varying sizes of oral cavities among the subjects. Changing the depth of the ultrasound will change the appearance of the tongue height; therefore, tongue heights are not compared between different participants, but rather within each participant’s set of data. Additionally, the field of

view among the participants varied slightly, as the ultrasound probe collected data at varying angles for each participant, to capture the best quality of picture. For some participants, the probe was angled back toward the posterior portion to view the full oral cavity, creating a slightly different view. Each of the four analyzed participants displayed tongue shape characteristics that were shared by a portion of the entire subject pool, which will be further discussed in Chapter 6: Experimental Conclusions.

To analyze a tongue shape during one vowel or one trumpet pitch, it was necessary to narrow the analysis to specific words and trumpet exercises. For the following data from the four chosen subject examples, the vowels were extracted from the words “doe,” “do,” and “tea.” These words were chosen because the images were clearest throughout the four participants for these three words. In addition, the researcher would have preferred to also include a word with the “ah” sound, but the chosen word list did not contain significant examples (also discussed in the conclusions). To extract only the vowel from these words, the researcher listened to the recording while viewing a spectrogram of the participant’s speech created by the AAA software program. A spectrogram is a visual representation of an acoustic phenomenon, and can be oversimplified as a “graph of sound,” with time on the horizontal axis and the sound’s frequency on the vertical axis.³¹ A spectrogram of the word “doe” can be seen in Figure 5.4 as an example.

In speech, the visual image of the spectrogram heavily relies upon the word being analyzed, including the exact positioning of the vowels and consonants within the word. These positions are very important during analysis, as a phenomenon known as “co-

³¹ Peter Ladefoged, *A Course in Phonetics* (Boston: Wadsworth, 2010), 310.

articulation” can heavily affect the analysis of even a single-syllable word. Co-articulation is defined as the temporal overlap of articulations belonging to neighboring speech sounds. Meaning that when one speech merges with an adjacent sound, co-articulation occurs.³² While co-articulation was not the focus of this research, it is important to note that vowels and consonants can be easily manipulated in the vocal tract in such a way that is nearly undetectable to the ear, especially during rapid speech. For this reason, it is necessary to analyze the speech with a visual spectrogram in conjunction with the speech recording. Interestingly, the spectrograms of the trumpet exercises appear in a much more systematic “bar graph” format. Even during slurred exercises, the spectrogram shows very clear demarcations for each note, displayed in Figure 5.5.

Figure 5.4 Spectrogram image of Participant No. 6 speaking the word “doe.”



Figure 5.5 – Spectrogram image of participant No. 6 playing Trumpet Exercise No. 1, a slurred, one-octave Concert B-flat major scale ascending and descending. Dark areas are sustained pitches, white vertical lines mark a change in pitch.



After analyzing the spectrogram of each spoken word to determine the specific placement of the vowels, the vowel area can be selected in the AAA program by clicking on the exact location in the spectrogram. The program then automatically displays the

³² Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), 218.

corresponding tongue shape at that exact point in time. The following data was collected in this manner for each of the four participants. The tongue shapes for trumpet pitches were extracted only from the pitches in Trumpet Exercise No. 3. In the exercise, the following pitches were analyzed for each participant: the first Concert B \flat 3 played, the first Concert B \flat 4 in the ascending portion of the scale, and the high Concert B \flat 5.

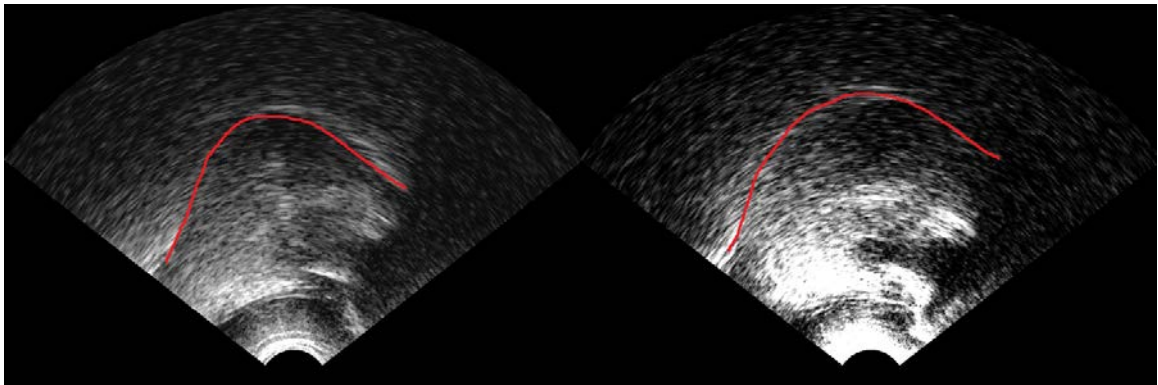
Trumpet Exercise No. 3 is reproduced in Figure 5.6 below.

Figure 5.6 – Trumpet Exercise No. 3: Two-octave Concert B-flat major scale, ascending and descending.



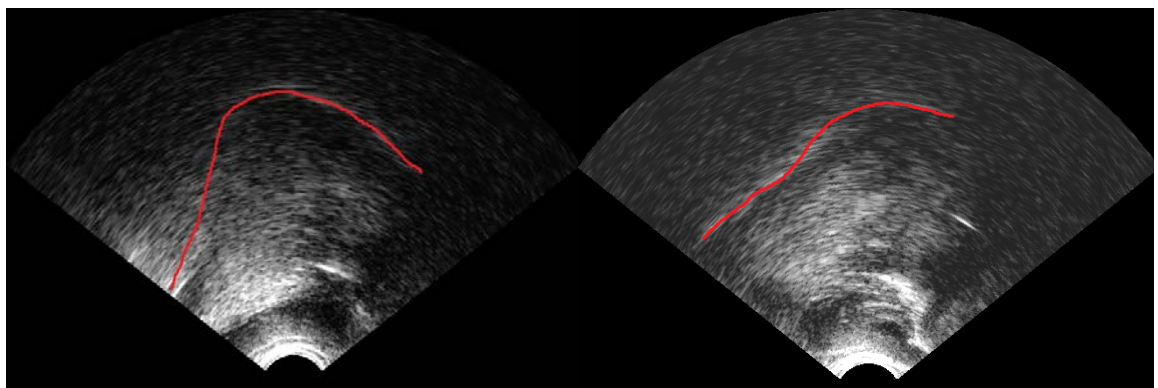
The ultrasound image data is displayed in Figure 5.7 with a particular vowel displayed next to a specific pitch. This is used purely for display purposes with vowels typically referenced as “low to high” in some of the brass community, as placed next to pitches in the low, middle, and high register on the trumpet. This display is not intended to form any correlation between tongue shapes of specific vowels and pitches, which will be discussed in the experiment conclusions. The data in Figure 5.7 is sorted by each participant’s separate data for each vowel and pitch. The vowel tongue shapes were extracted from the words “doe,” “do,” and “tea.” Figure 5.7 appears on the following page to allow for visual continuity of each participant’s individual images.

Figure 5.7a – Participant No. 6 (image placement not intended to demonstrate correlation).



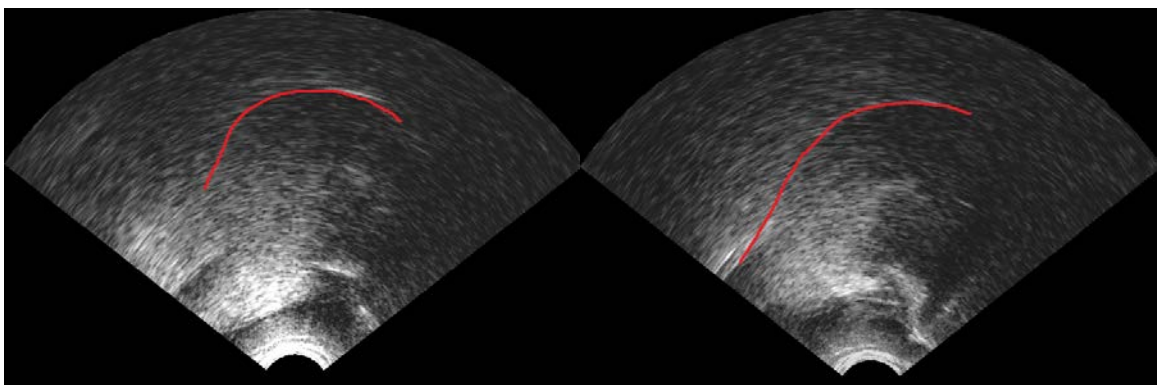
/o/ (as in “doe”)

Bb3



/u/ (as in “do”)

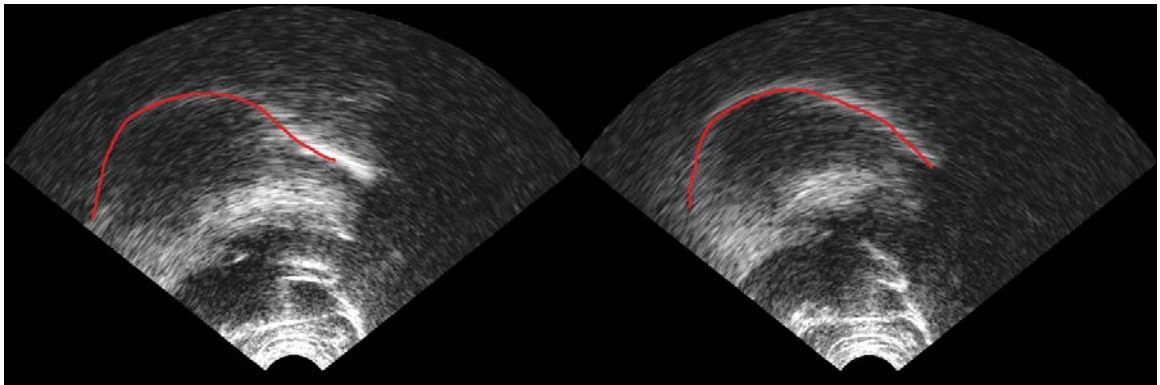
Bb4



/i/ (as in “tea”)

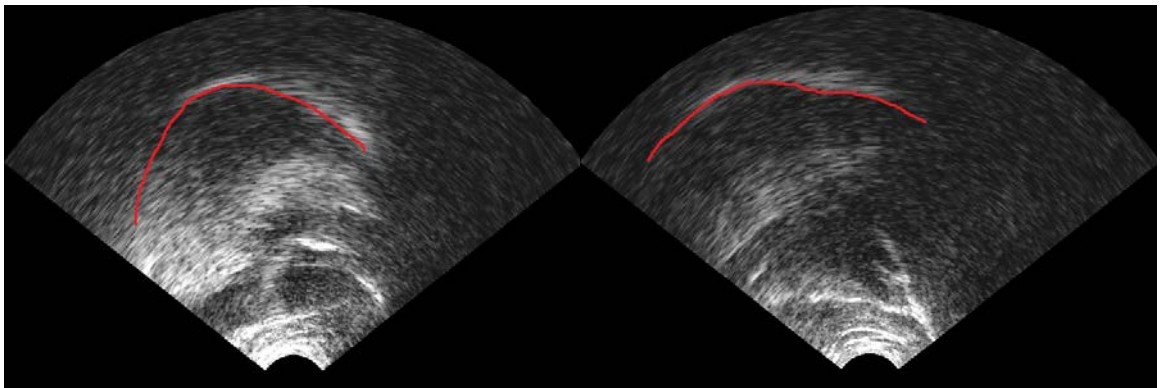
Bb5

Figure 5.7b – Participant No. 11 (ultrasound probe angled toward anterior portion of oral cavity, displaying tongue farther to the left of the image than other data)



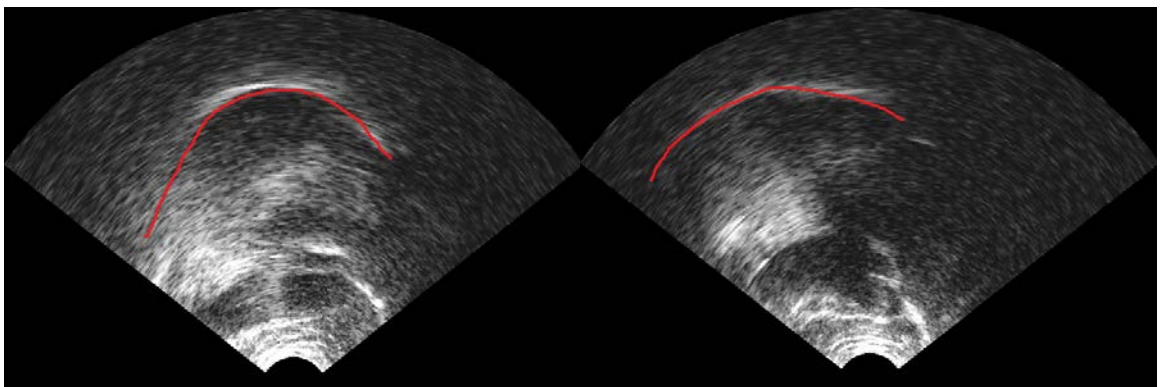
/o/ (as in “doe”)

Bb3



/u/ (as in “do”)

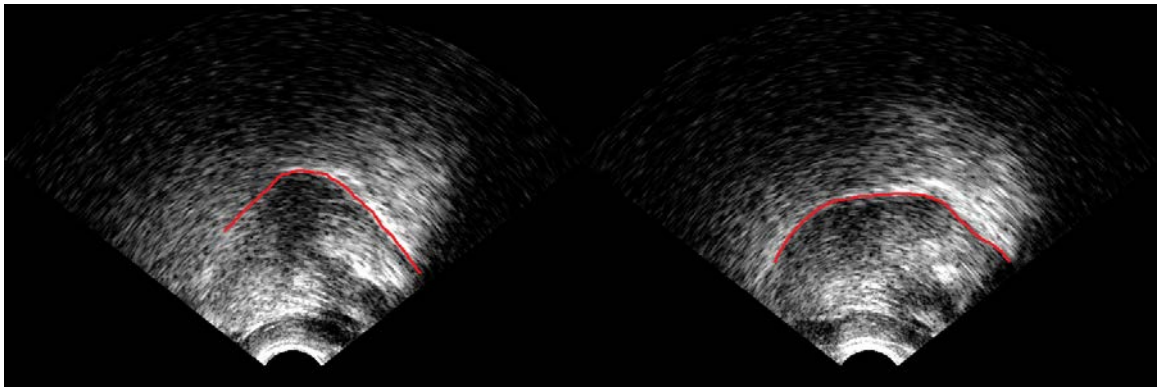
Bb4



/i/ (as in “tea”)

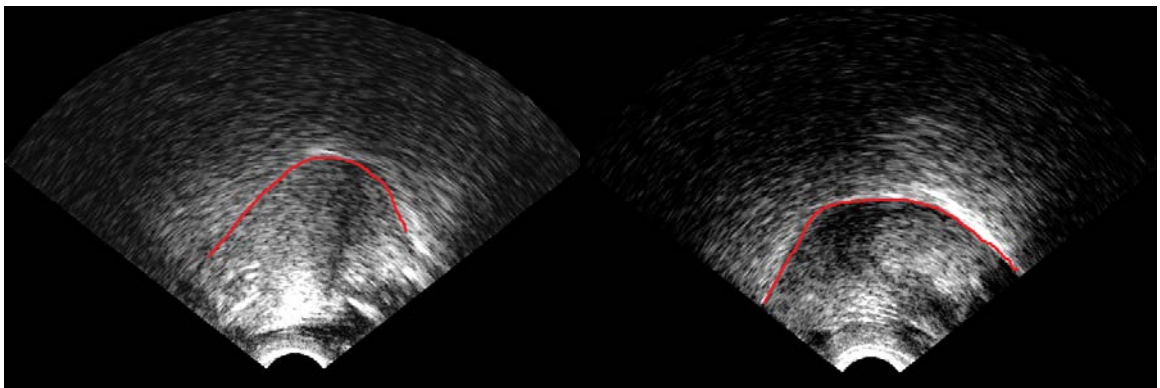
Bb5

Figure 5.7c – Participant No. 12



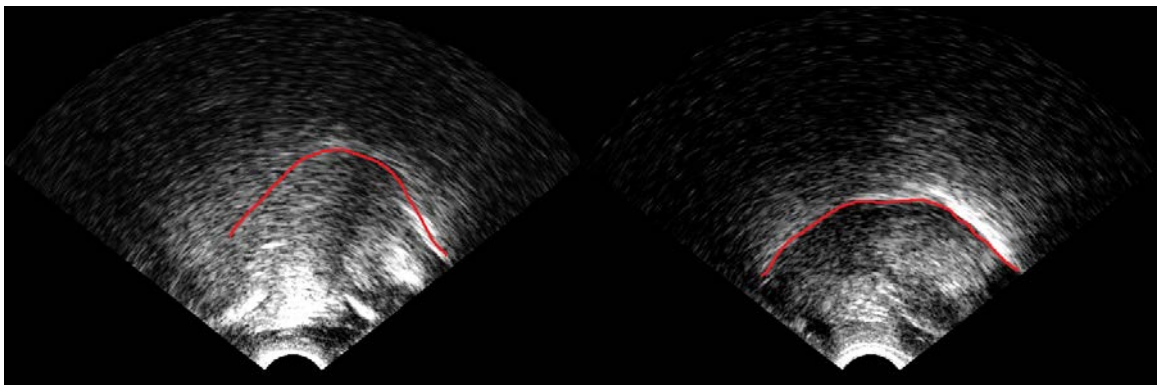
/o/ (as in “doe”)

Bb3



/u/ (as in “do”)

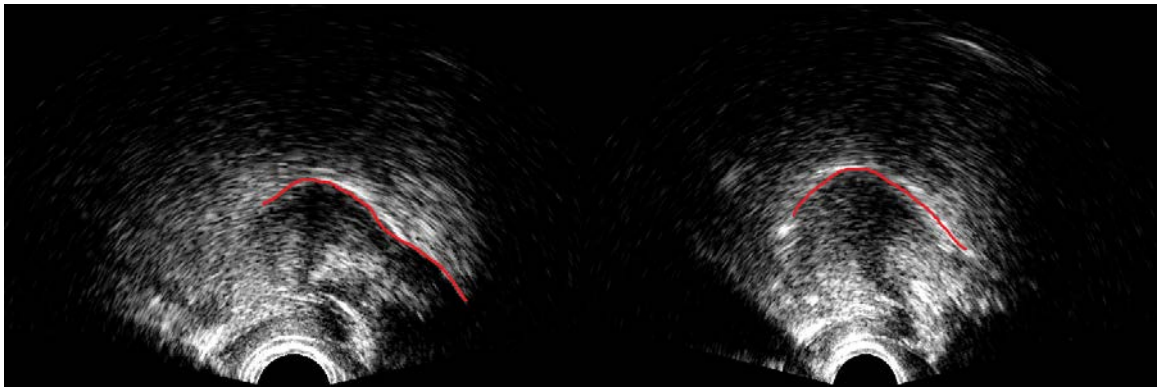
Bb4



/i/ (as in “tea”)

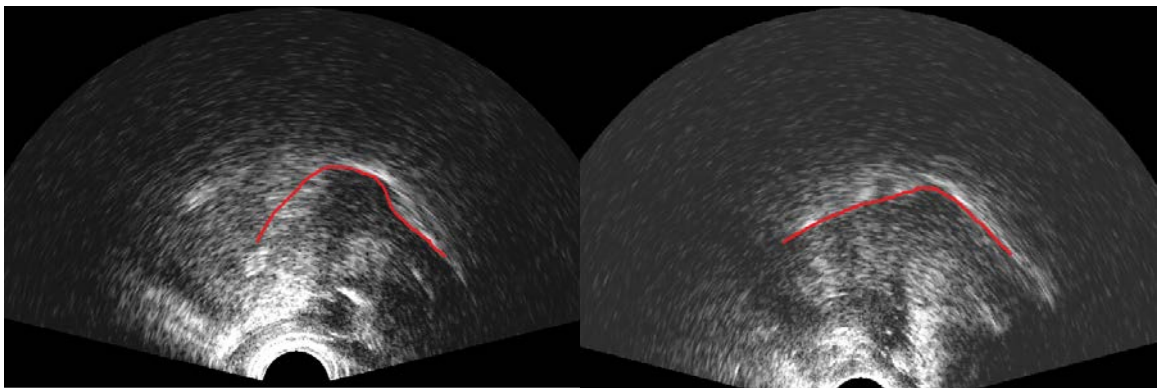
Bb5

Figure 5.7d – Participant No. 20



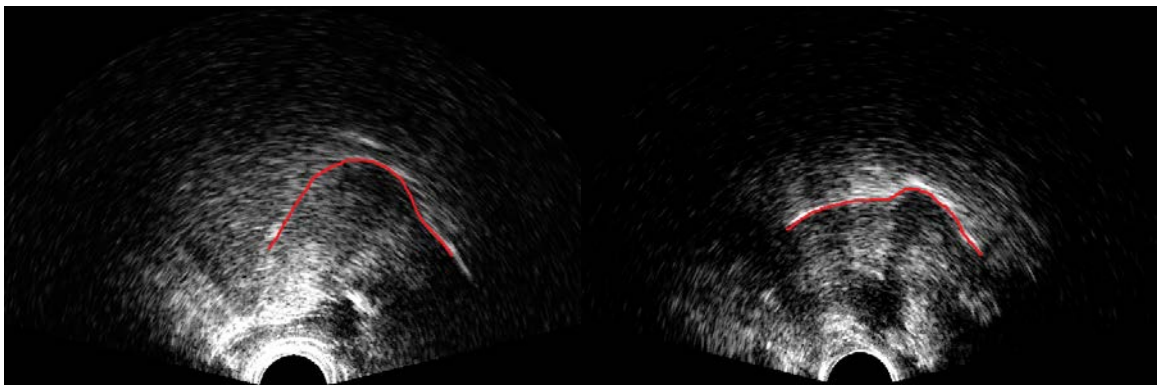
/o/ (as in “doe”)

Bb3



/u/ (as in “do”)

Bb4



/i/ (as in “tea”)

Bb5

Variations in Analysis

As with any study, variations in the data collection and analysis processes are to be expected, although every attempt is made to reduce this variability as much as possible. In the case of this experiment, several variations were either unavoidable or preferable to the alternatives, which the author deemed more disruptive to the goal of uniform data collection. The most obvious variation is that each player was introduced to a foreign environment and expected to play wearing a headset. Each player was given time to play a short warm-up to acquaint themselves with the sensations of headset and the contact of the transducer under the chin. However, this situation is hardly normal for a musician, which could have produced abnormal variations in physical production habits.

One other variation is each participant's years of experience playing the trumpet. Subjects ranged from 18 to 38 years of age and with a wide variety of years of experience playing the trumpet. While amount of experience can often equate to level of proficiency in a task, this correlation does not always hold true, especially in the case of learning a musical instrument. This can be observed simply by the comparison of child prodigies and virtuosos to older students and adults with lower ability levels in some or all areas of performances. In addition, "ability" is a subjective term that relies heavily upon personal opinions, which are uncontrolled variables in themselves. Therefore, this research does not intend to take each participant's age or experience into account for the purposes of data analysis.

Another important variation is the stipulation that participants use their own personal trumpet and mouthpiece. While the study indicates the trumpet exercises are to

be played exclusively on B-flat trumpet, participants used a wide variety of models by various manufacturers. The same is true for personal mouthpiece choice. While this could create possible variations, the alternative solution of all participants performing on the same instrument and mouthpiece has the potential to introduce even greater variability. As with any instrument, performers gain kinesthetic memory and consistency when using the same trumpet and mouthpiece for years or even decades. If a completely foreign set of equipment were to be introduced, many performers may lose a great deal of natural consistency and automatically change playing habits to adapt to the new equipment. The researcher determined that the variations created by an unfamiliar instrument or mouthpiece would exceed those created by the use of individualized equipment.

It is also worth noting that each participant played the set of exercises at slightly different times of day and also with varying levels of warm-up and/or fatigue. It is possible that some participants were not as physically warmed up to play the trumpet and conversely, some participants could have been fatigued from a full day of practicing and rehearsing. It is difficult to empirically analyze a player's level of warm-up and fatigue, although these do factor significantly into sound production on the trumpet. This variable could affect the response of the lip muscles and tissue, which could cause changes in the oral cavity to compensate for these variations.

In addition, due to the various shapes and sizes of each participant's facial structure and oral cavity, the corresponding ultrasound data has the potential to vary from person to person. Some images gathered were less clear than others, creating a greater possibility of researcher error during analysis. On the subject of researcher error, all of the tongue surfaces in the images were mapped by hand, creating further margin for error.

The researcher was assisted by an experienced phonetician during much of the data collection and analysis process, yet researcher error still remains a significant possibility in this form of analysis.

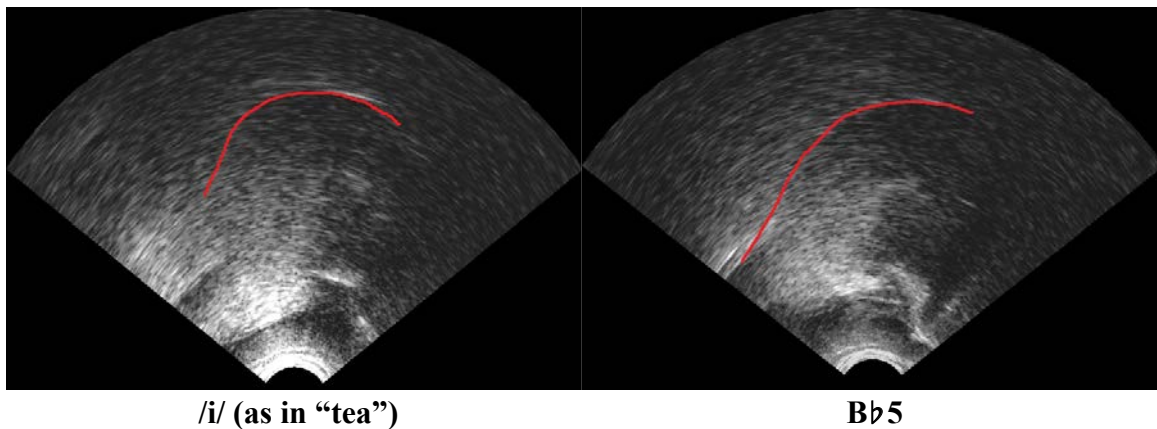
CHAPTER SIX

EXPERIMENT CONCLUSIONS

Question 1

Can tongue movements during speech relate to those made during trumpet playing? After analyzing the above data, it appears that the movement of the tongue relates to speech in some participants more than others. For example, the data collected from Participant No. 6 appears to display a weak correlation between the tongue position during the /i/ vowel and the playing of Concert B♭5, shown in Figure 6.1. The tongue height and shape of the antero-dorsum are very similar to the eye, while not exactly the same (the postero-dorsum is not as visible in the /i/ vowel image).

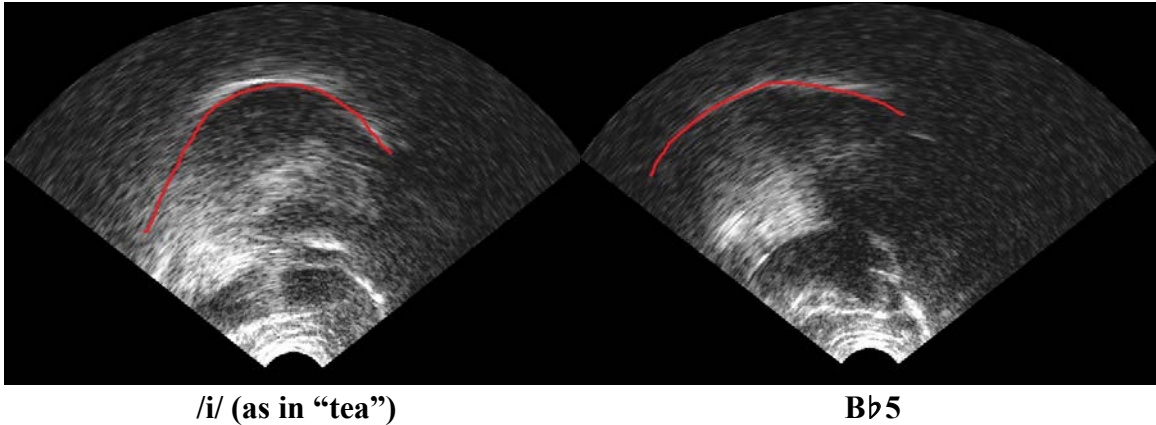
Figure 6.1 – Participant No. 6



However, the same vowel and pitch look very different for Participant No. 11, shown in Figure 6.2. The tongue appears significantly more curved during the /i/ vowel, with the root and tip of the tongue both pull toward the bottom of the mouth. In the B♭5

image, the tongue tip appears to be much farther toward the posterior of the oral cavity and displays significantly less curvature.

Figure 6.2 – Participant No. 11



While differing production tactics were not compared in the same participant, these two varying approaches to playing the same pitch indicate that some performers utilize formations similar to speech during trumpet playing, while others do not. Although this data is not a large cross section of the trumpet-playing population, it is important to take all possibilities into account as an educator. The author believes that viewing such opposing images for only two participants demonstrates the need for teachers to pursue all possible pedagogical angles regarding tongue position, as each student's needs are significantly individualized.

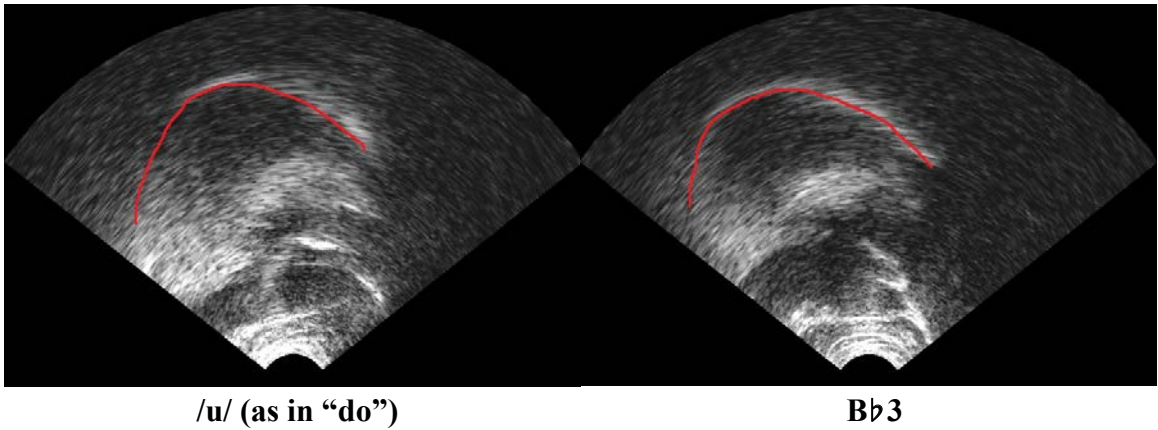
Question 2

Are the specific vowel formations referenced in various method books utilized while producing sounds on the trumpet? The conclusion that can be drawn from the two examples above is that some players utilize tongue positions that are somewhat similar to the specific vowels referenced in method books, while others do not appear to use

remotely the same vowel shape to play the same note. Many of the method books referenced in Chapter 2 discuss utilizing “EE” (/i/) in the upper register to create a tongue arch or to raise the tongue height in general. In Figure 6.1 above, it appears that Participant No. 6 is using a tongue position for Concert B♭5 that is somewhat similar to the /i/ vowel found in the word “tea” as spoken by the participant. However, in Figure 6.2 above, Participant No. 11 has a very different tongue position for Concert B♭5 than for the /i/ vowel, yet both participants successfully produced B♭5 in the upper register. This successful production of the pitch is important to note, because it is possible that some performers could utilize vowel formations and not successfully produce particular pitches. The author believes the fact that Participant No. 6 successfully produced B♭5 with a tongue position similar to /i/ indicates that teaching vowel positions to a student could remain a successful tactic in a brass studio and should not be abandoned altogether. However, results may vary from student to student, as indicated by the opposing tongue position image for Participant No. 11’s B♭5, which does not correlate to the participant’s /i/ vowel (or any of the participant’s three specific vowels analyzed for this study).

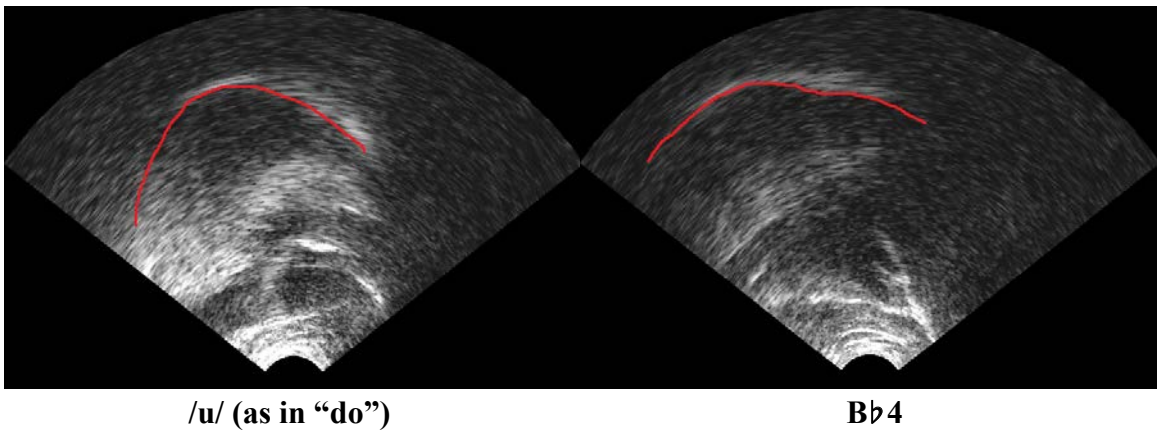
In further discussion of vowel usage, J. B. Arban’s text advocates the use of “TU” for an appropriate consonant and vowel pairing, but does not seem to suggest different vowels for particular registers. As shown in Figure 6.3 below, Participant No. 11 appears to utilize a somewhat similar positioning of the tongue to produce the /u/ vowel and Concert B♭3, although there are noticeable differences. The tongue tip is in a similar location and the root of the tongue is low in the mouth, yet the surface contour varies between the two images.

Figure 6.3 – Participant No. 11, /u/ compared to Concert B♭3.



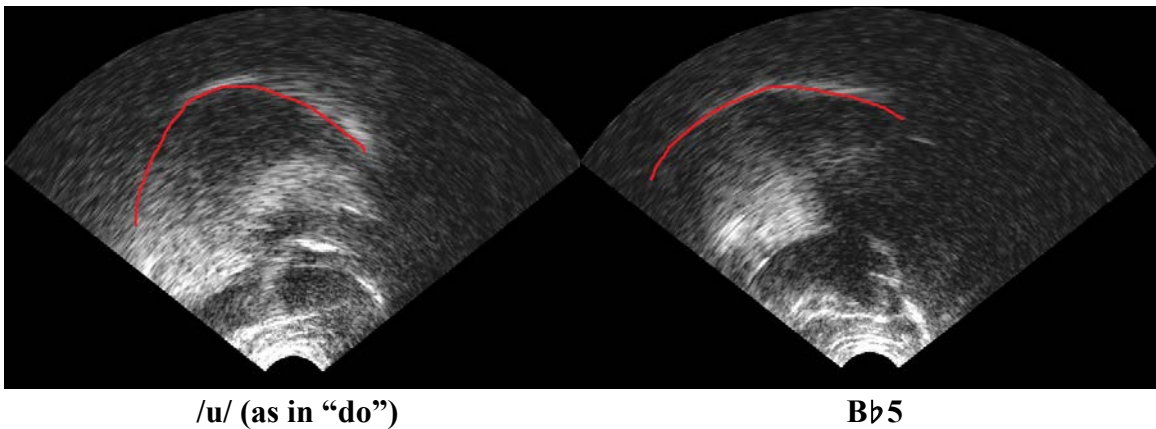
The Concert B♭3 imaged above is considered to be a relatively low note in the usable register of the trumpet. For a different pitch, such as Concert B♭4 in the middle register, the tongue position for the /u/ vowel looks extremely dissimilar to the tongue position while playing Concert B♭4, as shown in Figure 6.4.

Figure 6.4 – Participant No. 11, /u/ compared to Concert B♭4.



The same holds true when comparing /u/ to Concert B♭5 in the high register. As displayed in Figure 6.5 below, the tongue shapes appear drastically different when comparing /u/ to B♭5. These images are very similar to the findings in the article by Iltis and Epstein regarding the use of vowels in horn playing, except the conclusion from the data of this author’s current study does not display a strong correlation of vowel usage while playing the trumpet, as it is not fully supported by the corresponding tongue shapes. This is an important pedagogical note, as teachers may need to incorporate approaches other than spoken vowel shapes for all pitches or for particular pitch registers on the trumpet.

Figure 6.5 – Participant No. 11, /u/ compared to Concert B♭5



Question 3

If specific vowels are used, which vowels are utilized and do these correspond to particular pitches or registers on the instrument? As stated in the conclusions of Question 2, participants used tongue shapes slightly similar to some vowels while playing, but the images from the study’s analysis were not similar enough to form a strong correlation.

Therefore, specific vowels cannot be definitively used for every performer to effectively play specific pitches or registers on the trumpet.

While the pedagogical implications for this conclusion have been discussed above, it is interesting that a very similar conclusion was reached by Dr. Hiigel in his research in the late 1960s, yet the use of vowel formations continues to be perpetuated in modern brass teaching. If a similar conclusion of this inefficacy appears to hold true nearly 50 years later, why are brass teachers continuing to utilize vowels in brass teaching? In the author's opinion, a portion of this perpetuation is caused by a well-deserved reverence for early brass pedagogues and their method books (many of whom are referenced in Chapter 2: Overview of Trumpet Method Books). These early teachers did not have access to advanced technologies, yet their methods produced and continue to produce fine brass players in each generation. This may cause current teachers to believe that all aspects of each method book, including the preface, are pedagogically accurate.

Additionally, the use of vowel formations may continue in brass teaching because it appears effective for some students. This is displayed in part by Participant No. 6's utilization of a tongue position similar to /i/ for a Concert B \flat 5. It is also possible, however, that many successful professionals and students *believe* they are utilizing vowel positions, when in fact corresponding ultrasound imagery could prove otherwise. This thought process is contingent upon kinesthetic awareness and reinforcement. For example, a student struggling with a particular pitch is told to create a vowel formation in the oral cavity. The student makes his/her best attempt to recreate the vowel and over time improves the sound of that pitch. The teacher then reinforces this acoustical improvement, although it has not been visually assessed if the student is producing that

particular vowel in the oral cavity. This could cause the teacher to perpetuate this thought process to future students, due to the resulting perception of acoustical improvement. This phenomenon could also cause the student to perpetuate the use of vowels to future students, as he/she believes that this process caused the acoustical improvement as well. In reality, the student could have easily formed a significantly different tongue position to produce the successful pitch, but came to this result through personal trial and error. The author believes this reliance on kinesthetic awareness and perception has successfully guided many students and professionals, but can produce misleading results if visual assessment is purged from the equation. This concept of kinesthetic perception versus visual analysis of the oral cavity could be a significant topic for further research for brass players and the entire music community.

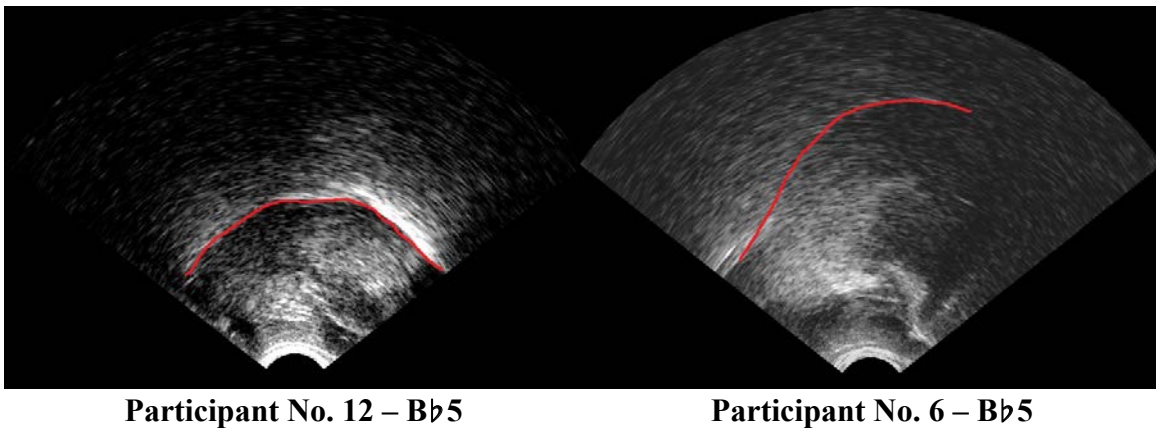
Other Experiment Observations

As previously stated, the four participants selected for analysis in this study were chosen due to image clarity and also the fact that each represented tongue positions found within particular factions of the research pool. More specifically, participants varied widely in the performance of Trumpet Exercise No. 3 (two-octave ascending and descending Concert B-flat major scale, displayed in Figure 5.6 of the previous chapter). Several participants struggled to produce pitches in the upper register, either by “cracking” notes (losing the initial response of a pitch) above the staff or creating a weak, pinched sound (as assessed subjectively by the researcher). The subjects that struggled significantly in the upper register were Participants No. 5, No. 12, No. 15, and No. 20. During the analysis process, the researcher analyzed No. 12 and No. 20 out of this group. Participants that struggled in the upper register comprised 25% of the data pool and

Participants No. 12 and No. 20 provided representative data similar to the other two participants that struggled with range.

The author found in general that subjects struggling with range had “flatter” tongue positions while playing Concert B♭5 than those that performed notes above the staff with ease. Figure 6.6 displays Participant No. 12 playing Concert B♭5, compared to Participant No. 6, who did not struggle with range. Participant No. 12’s tongue position is noticeably more flat in the contour of the tongue surface and appears to occupy much less space in the oral cavity, although as previously mentioned, tongue height is not being compared between subjects in this specific analysis.

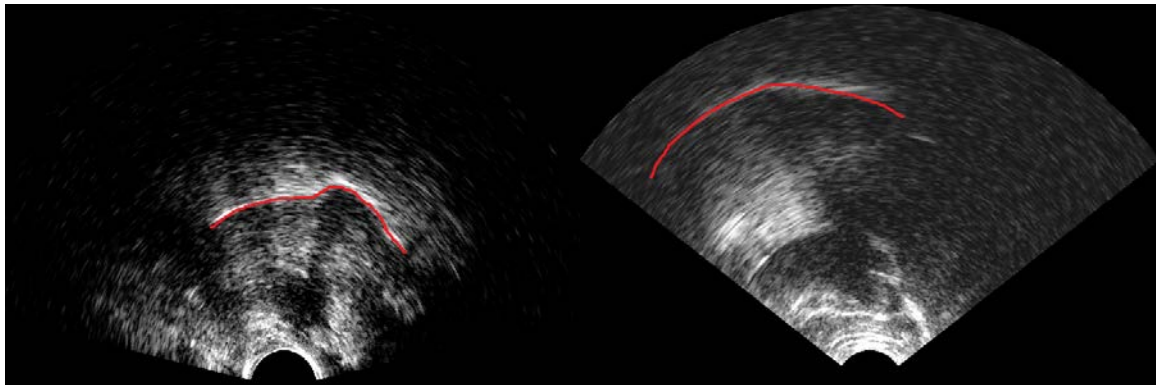
Figure 6.6 – Participant No. 12 (struggled with range) and Participant No. 6 (did not struggle with range) performing Concert B♭5 in the upper register.



Similarly, Figure 6.7 compares Participant No. 20 and No. 11 performing Concert B♭5. Participant No. 20 struggled with range, with a very small, pinched sound above the staff, while Participant No. 11 had a significantly stronger upper register. Once again, Participant No. 20 appears to have a lower tongue position (also with less variation between images for different pitch registers), while Participant No. 11 has a noticeable

arch to the tongue, with significantly more of the postero-dorsum raised in the oral cavity. Additionally, both Participant No. 6 and No. 11 (successful with range) appear to have a larger portion of the tongue filling the oral cavity, although this is inconclusive without fully mapping the roof of the mouth.

Figure 6.7 – Participant No. 20 (struggled with range) and Participant No. 11 (did not struggle with range) performing Concert B♭5 in the upper register.



Participant No. 20 – B♭5

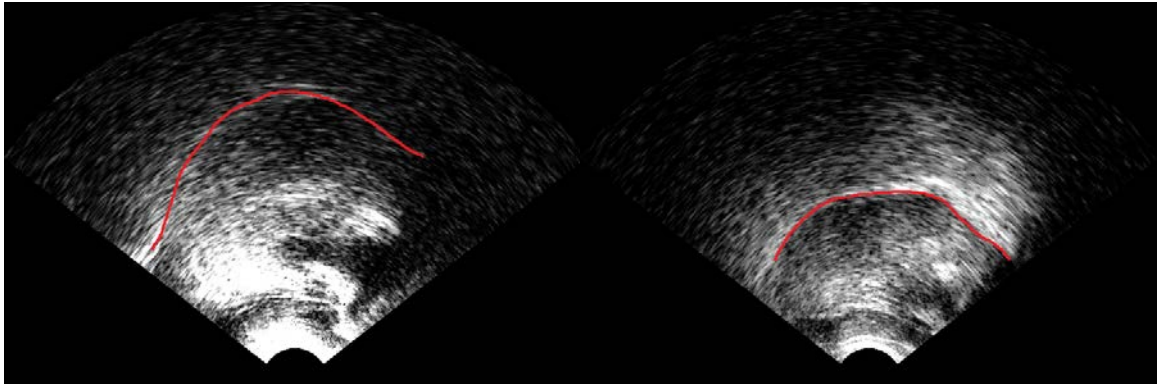
Participant No. 11 – B♭5

In addition, participants with more ease in the upper register also appeared to display a more arched and higher tongue position throughout all registers. This included visual data from other participants with ease in the upper register, which were not directly analyzed for data. In fact, some participants with exceptional range had tongue positions that were high enough in the mouth that the ultrasound software was unable to accurately capture the surface of the tongue. While these images were not of sufficient quality to be mapped for data, it was visually clear that the surface of the tongue moved very high in the mouth. For some of these same participants, the tongue appeared to begin in a high starting position in the oral cavity, even for Concert B♭3 in the low register. In contrast, participants that struggled with range had very clear ultrasound images, with the tongue surface clearly visible. This would imply that players with a smaller amount of empty air

space in the oral cavity may be more naturally inclined to play easily in the upper register. This hypothesis is merely conjecture and requires further study.

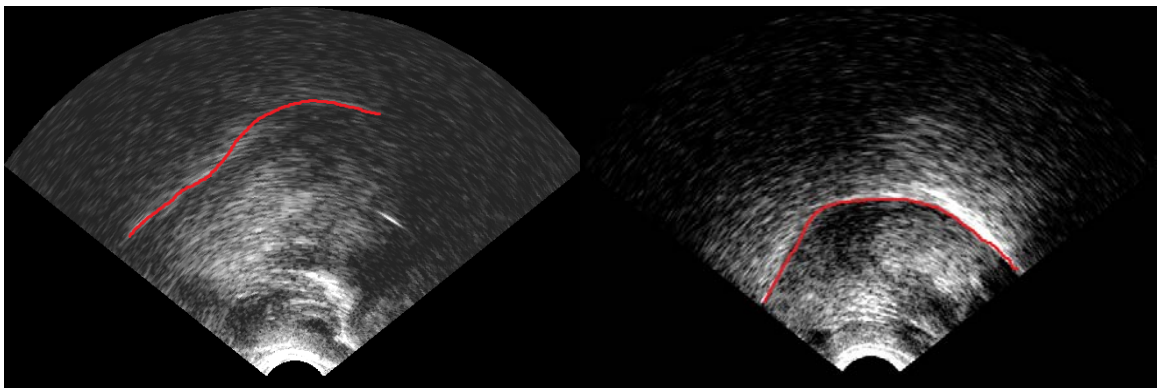
When directly comparing tongue shapes, Participant No. 6 utilizes a significantly arched tongue shape for all three pitches, while Participant No. 12's tongue remains in a low, slightly rounded arch for all three pitches (shown in Figure 6.8). In a related observation, participants that struggled with range also appear to have less variation in tongue shape when changing registers on the trumpet. Both Participant No. 12 and No. 20 maintain a similar, low arch that does not vary in the octave displacements present between Concert B \flat 3, B \flat 4, and B \flat 5, and both participants struggled significantly to produce Concert B \flat 5 in the high register. Participant No. 6 and No. 11 show a wider variation in tongue shape, including the position of the tongue tip, but especially in the position of the postero-dorsum (far back) visible portion of the tongue. While this is only a portion of the subject pool, these observations regarding range could be valuable teaching tool when attempting to teach range to a struggling student.

Figure 6.8 – Participant No. 6 with a more drastic tongue arch in all registers, compared to Participant No. 12 with flatter tongue arch. Participant No. 12 struggled significantly in the upper register.



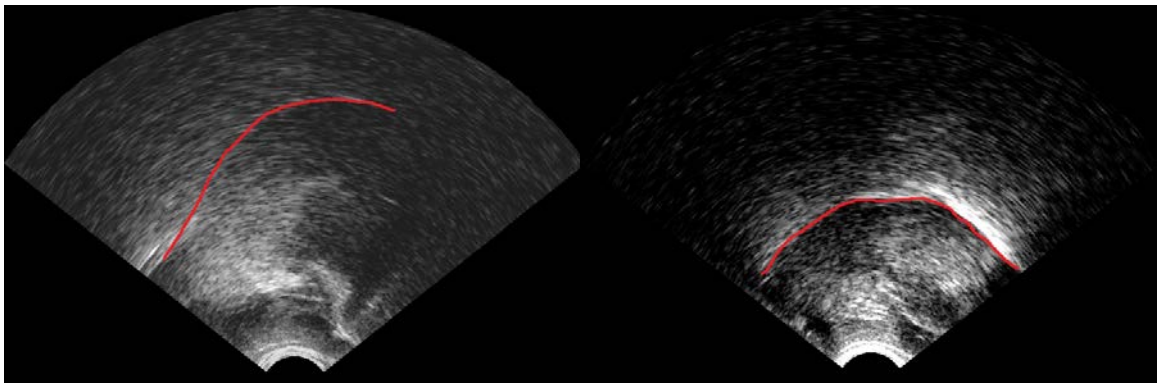
Participant No. 6 – Bb3

Participant No. 12 – Bb3



Participant No. 6 – Bb4

Participant No. 12 – Bb4



Participant No. 6 – Bb5

Participant No. 12 – Bb5

Pedagogical Alternatives

After reading the above conclusions, many teachers may find it difficult to create alternatives to vowel formations when directing a student to produce an acoustic goal. Throughout the research process, the author has attempted to find additional pedagogical tools that aid in personal performance, as well as in the teaching of young brass students. The author has found the use of “wind patterns” to be a particularly effective alternative to vowel formations. These can be accomplished by the teacher displaying the perceived air speed for a particular note by blowing only the “wind” through the lips without the trumpet and without creating a buzz. The teacher can then ask the student to replicate the acoustic phenomenon with his or her wind. Similar to the previous issue with vowels in the brass community, the efficacy of this pedagogical practice has not yet been visually assessed in a conclusive manner. However, in a specific example for young students, the author has found that the analogy of a target (such as those used in archery or the game of darts) can be an effective tool for displaying the change in air from the low to high registers. In this exercise, students are told to make a large circle with both hands in front of the mouth and imagine a target in the circle. To create a low note, it is often effective for the student to imagine blowing air that covers the entire target. They can ensure the quality of air by feeling the wind on their hands at the outer edge of the circle. To play a high note, it is often effective for the student to be given the instruction of visualizing the air as only striking the exact middle, or “bull’s eye,” of the target. This can be assessed by ensuring the student does not feel any wind on the hands that create the outer edge of the target. However, the teacher must beware that the student is not simply directing the air below the target circle. To avoid this phenomenon, the author has found that holding a

small strip of paper in the target circle from above can ensure that the air stream is indeed contacting the “bull’s eye.” Once again, the efficacy of this practice has yet to be determined in an official study or with a large cross section of students, but has proven to be a fun and effective tool for young trumpet players.

In the conclusions regarding range, the author hypothesizes from the data that filling the oral cavity with the tongue creates more ease in the upper register. If vowels or wind patterns prove to be ineffective for a particular student, the author believes the material regarding “anchor tonguing” in “Chapter 2: Overview of Trumpet Method Books” could be a useful pedagogical tool, even for students without range concerns. While this previous material discusses tongue placement, the reasoning behind utilizing anchor tonguing to improve range has a basis in physiology. In anatomical terms, the tongue is a type of “muscular hydrostat.” Hydrostats are comprised of muscle fibers and flesh that are mainly unsupported from a skeletal frame. In the *Articulatory Phonetics* text, Gick et al. use the analogy of a water balloon, which has a fixed volume of contained liquid.³³ If one portion of the balloon is squeezed, the displaced liquid will move to the less constricted area, creating a bulge. The function of the tongue is similar to this analogy, as when one portion of the tongue is constricted by underlying muscles, another portion of the tongue will “bulge” as a result. Therefore, if the tip of the tongue is placed gently behind the bottom front teeth, the body of the tongue tends to curve upward as a result. One can test this theory by saying words such as “tea” or “too” in a natural manner, and then attempting the same words with the tip of the tongue “anchored” behind the teeth.

³³ Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), 156.

Anchor tonguing could also prove to be particularly beneficial for those students with *ankyloglossia* or “tongue-tie.” *Ankyloglossia* is a condition in which the tongue is fastened to the bottom of the oral cavity, either by a short *lingual frenulum* (the miniscule flap of skin connecting the tongue to the bottom of the mouth) or by the *frenulum* being connected nearer to the tip of the tongue.³⁴ The author hypothesizes that many brass players with *ankyloglossia* may already utilize anchor tonguing out of necessity, either consciously or unconsciously, although this is untested and remains a point of further research. The author believes anchor tonguing could be a useful remedy for articulation or range problems for many students and could eliminate the need for invasive surgeries for those with *ankyloglossia*.

The above conclusions are intended to be observational in nature and any practical or prescriptive conclusions that may be drawn from this research will require further assessment before being applied with certainty. The main conclusion of this study is that there appears to be significant variation in tongue position, shape, and overall usage by participants in all registers of the trumpet and while speaking the same set of English words. Some performers utilize tongue positions that are somewhat similar but not identical to vowel shapes, while others show significantly different tongue shapes with no visible correlation to the individual’s spoken vowels. Due to this, the use of vowels and other phonetic teaching tools in brass pedagogy could prove to be beneficial for some students, while proving ineffective or possibly detrimental for others. This study presents significant options for further research within overlapping portions of the fields

³⁴ Brian Gick, et al., *Articulatory Phonetics* (West Sussex, UK: Wiley-Blackwell, 2013), 178.

of brass pedagogy and linguistics, in which a wealth of information has yet to be discovered.

Appendix

Score

Trumpet Exercises

UK Phonetics Lab

Trumpet in B \flat ① Slur $\text{♩} = 76$

B \flat Tpt. ② Single-Tongue

B \flat Tpt. ③

B \flat Tpt. ④

B \flat Tpt. ⑤

B \flat Tpt. ⑥

B \flat Tpt. ⑦

B \flat Tpt. ⑧

9

B \flat Tpt.

56

B \flat Tpt.

10

Slow Double-Tongue (Quarter = 76 bpm)

B \flat Tpt.

67

B \flat Tpt.

11

Fast Double-Tongue (Quarter = 140 bpm)

B \flat Tpt.

76

B \flat Tpt.

12

B \flat Tpt.

83

B \flat Tpt.

85

B \flat Tpt.

13

Quarter = 60 bpm

B \flat Tpt.

14

"Poo Attack" (Lips Alone, No Tongue)

B \flat Tpt.

Part II

Marisa Youngs, Trumpet
In a DMA Trumpet Recital

with Robert Jeter, Piano
Christine Sallas, English Horn

Wednesday, May 4th, 2016, 8:00 PM
Recital Hall, Singletary Center for the Arts
University of Kentucky

PROGRAM

Sonata per Clarino in C-Dur (unknown, ed. 1990) Carl Heinrich Biber
(1681–1749)
I. Allegro Assai
II. Aria, Più Andante
III. Presto

Concerto for Trumpet and Orchestra (1955) Aleksandra Pakhmutova
(b. 1929)

INTERMISSION

Caprice (1943) Eugene Bozza
(1905–1991)

“Send in the Clowns” (1973) Stephen Sondheim
(b. 1930)
arr. Marisa Youngs

featuring Christine Sallas, English Horn

Centennial Horizon (2011) Kevin McKee
(b. 1980)
I. Aspen Grove
(Interlude – Alpenglow)
II. Roaring Gunnison

PROGRAM NOTES

Sonata per Clarino – Carl Heinrich Biber

Carl Heinrich Biber (1681–1749), son of composer Franz Biber, was an Austrian violinist and composer during the late Baroque era. He is known for his masses and liturgical works, and was no stranger to the trumpet, writing two important sonatas for six- and eight-voice trumpet ensembles with kettledrums.³⁵ *Sonata per Clarino* is one of his few surviving instrumental solos. “Clarino” refers to the style of Baroque trumpet playing in which the soloist is required to play in a light, virtuosic manner, usually in the extreme upper register of the instrument.³⁶ As with all compositions for trumpet in the Baroque Era, this work would have been written for the natural (valveless) trumpet, pitched in the key of C for this specific piece. However, many current performers choose to play the piece on the modern piccolo trumpet pitched in A and transpose. In modern renditions, the accompaniment is often performed on piano, organ, or harpsichord.

Sonata per Clarino is in three short movements in the rather common “fast-slow-fast” layout. The first movement begins with a short piano introduction followed by a *cantabile* melody by the solo trumpet. The first melodic section is repeated, giving the soloist the opportunity to perform light ornamentations on the melody. The second movement begins at a slow, ponderous tempo and features the piano alone. Several well-known works for trumpet from the Baroque Era contain movements in which the soloist is *tacet*, including the third movement, *Adagio*, from Henry Purcell’s *Sonata in D* and the

³⁵ Margaret Sarkissian and Edward H Tarr, “Trumpet,” *Grove Music Online*, ed. Deane Root, accessed April 1, 2018, <http://www.oxfordmusiconline.com.ezproxy.Uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-3-0000049912>.

³⁶ *Ibid.*

Adagio-Presto-Adagio movement from Giuseppe Torelli's *Concerto in D*. The final movement of Biber's work is quick and light with virtuosic leaps and flourishing lines of sixteenths.

Concerto for Trumpet and Orchestra – Aleksandra Pakhmutova

Russian composer Aleksandra Pakhmutova (b. 1929) has won numerous awards for her compositions throughout multiple genres of classical music. She is most well-known for her popular songs, which number over 400 and are frequently performed throughout Russia. She has also composed several pieces for orchestra, as well as choral works and film music.³⁷ *Concerto for Trumpet and Orchestra* was composed in 1955 and a revised edition was published by the composer in 1978. As with many Russian and eastern European works for trumpet, it was made famous by virtuosic soloist Timofei Dokshizer. Much like the famed trumpet concerto by Armenian composer Alexander Arutiunian, Pakhmutova's concerto is a vast one-movement work, juxtaposing romantic lyricism with aggressive technical passages. The piece begins with a subdued, plaintive introduction displaying Pakhmutova's penchant for song-like melodies. This is followed by a fast-paced heroic theme comprised of syncopation and melodic leaps, displaying the soloist's technique. After a lengthy lyrical melody by both trumpet and accompaniment, a development of sorts takes place, once again displaying Pakhmutova's ability to combine lyricism and virtuosity. After a truncated recapitulation, the piece concludes with a combination of both the heroic and lyrical main themes, creating an ending of unrivaled force and energy.

³⁷ Aleksandra Pakhmutova, "Aleksandra Pakhmutova," accessed April 1, 2018, <http://www.pakhmutova.ru/>.

Caprice – Eugène Bozza

Born into a musical family in Nice, France, Eugène Bozza (1905–1991) began studying violin at a young age, attending the Paris Conservatory and winning numerous performance awards. While he is well-known today for his compositional output, especially for winds and brass, he was not recognized for any particularly notable works until his late twenties.³⁸ Bozza contributed greatly to the French repertoire for trumpet, including at least ten solo works and various *études*. *Caprice* is a mature work with a great deal of interplay between the trumpet soloist and piano accompaniment. It displays advanced articulation techniques and features a great deal of multiple tonguing. The piece also has significant range requirements, spanning two octaves of the trumpet's range and utilizing wide melodic leaps in the solo line. In addition, the work also requires a great deal of expression throughout the unmeasured *rubato* sections, which rely on the soloist's pacing of both tempo and dynamics. The piece opens with a strong, *quasi-cadenza* introduction in the solo trumpet. This fanfare gives way to an upbeat, bouncy theme in the trumpet featuring a great deal of syncopation and triple tonguing. Many of Bozza's works feature similar syncopations, displaying the influences of ragtime and jazz upon French music in the 20th Century.³⁹ The middle portion of the piece is a contemplative lyrical theme, which gives way to an exciting closing section, full of complex mixed meters and an exuberant race to the final note.

³⁸ Paul Griffiths, "Bozza, Eugène," *Grove Music Online*, ed. Deane Root, accessed April 1, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000003791?rskey=xSK6uI&result=1>.

³⁹ Jason Dovel, "The influence of jazz on the solo trumpet compositions of Eugène Bozza," (DMA diss., University of North Texas, 2007), accessed April 1, 2018, <http://ezproxy.uky.edu/login?url=https://search-proquest.com.ezproxy.uky.edu/docview/304813970?accountid=11836>.

“Send in the Clowns” – Stephen Sondheim (arr. Youngs)

Stephen Sondheim is arguably one of the most influential musical theater composers in American history. He has won eight Tony awards, eight Grammys, an Academy award, and a Pulitzer Prize, among other accolades.⁴⁰ “Send in the Clowns” is a featured number in one of Sondheim’s musicals, *A Little Night Music*. Outside of musical theater, it was made famous by Frank Sinatra, with other popular recordings and performances by Judy Collins, Barbra Streisand, Judi Dench, and various other artists. In the musical, the piece is sung by the character Desirée, as she reflects upon the rejection and heartbreak caused by a former lover. The original arrangement featured four verses and a bridge, written in a compound meter. The composer later explained that the “clowns” in the title do not refer to literal circus clowns, although the lyrics are evocative of this imagery. Sondheim says, “It’s a theater reference meaning ‘if the show isn’t going well, let’s send in the clowns’; in other words, ‘let’s do the jokes.’ I always want to know, when I’m writing a song, what the end is going to be, so “Send in the Clowns” didn’t settle in until I got the notion, ‘Don’t bother, they’re here’, which means that ‘We are the fools.’”⁴¹

⁴⁰ Jim Lovensheimer, “Sondheim, Steven,” *Grove Music Online*, ed. Deane Root, accessed April 1, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-1002225586?rsk=1RCB&result=1>.

⁴¹ Mel Gussow, “Send in the Sondheim; City Opera Revives ‘Night Music,’ as Composer Dotes,” *The New York Times* (June 10, 2008), accessed April 1, 2018, <https://www.nytimes.com/2003/03/11/theater/send-in-the-sondheim-city-opera-revives-night-music-as-composer-dotes.html?n=Top%2FReference%2FTimes+Topics%2FPeople%2FS%2FSondheim%2C+Stephen>.

Centennial Horizon – Kevin McKee

American trumpeter and composer Kevin McKee (b. 1980) has had recent success in the brass community for his many solo and chamber works in an exciting compositional style. *Centennial Horizon* is in two main movements with a short interlude, each of which showcases beautiful melodies and exhilarating technical passages. McKee says of the work, “With two contrasting movements (*Aspen Grove* and *Roaring Gunnison*) connected by an interlude (*Alpenglow*), I have attempted to capture some of the beauty and adventure of what truly is an amazing place: Colorado (the "Centennial State"). Inspired by my late grandmother’s love of that state, the first movement is an homage to her.”⁴²

⁴² Kevin McKee, *Centennial Horizon* (Trumpet & Piano), Kevin McKee Music, 2011.

Marisa Youngs, Trumpet
In a DMA Trumpet Recital

with Robert Jeter, Piano

Wednesday, February 8th, 2017, 6:00 PM
Recital Hall, Singletary Center for the Arts
University of Kentucky

PROGRAM

<i>Concerto for Trumpet & String Orchestra</i> (2012)	Brendan Collins (b. 1964)
I. Allegro Moderato	
II. Slow and Dramatic	
III. Allegro Vivace	
<i>The Sound of Silence</i> (1964)	Paul Simon (b. 1941) arr. Marisa Youngs
<i>Fête Joyeuse</i> (ca. 1905)	Henri Daller (1849–1934)

INTERMISSION

<i>Sonata for Trumpet & Piano</i> (rev. 1986)	Kent Kennan (1913–2003)
I. With strength and vigor	
II. Rather slowly and with freedom	
III. Moderately fast, with energy	
“Simple Song” from <i>Mass</i> (1971)	Leonard Bernstein (1918–1990)

PROGRAM NOTES

Concerto for Trumpet and String Orchestra– Brendan Collins

Australian composer and performer Brendan Collins (b. 1964) began his music career as a trombonist, serving as the associate principal trombone with Opera Australia for 11 years. Collins was later appointed to the position of composer-in-residence at Barker College in 2005.⁴³ *Concerto for Trumpet and String Orchestra* first began as a work for trumpet and piano, premiered by Judith Saxton at the 2012 International Trumpet Guild Conference in Columbus, Georgia. Collins then arranged the piece for string orchestra, premiered in 2014 by Rex Richardson in Sydney, Australia. The first movement begins with a lively piano introduction that gives way to a bouncy trumpet melody, featuring many rhythmic patterns and agogic accents that are similar to those found in the rock and funk genres. The second movement features a piano introduction before the trumpet enters with a beautifully haunting chromatic melody. Quintuplets are the recurring motives throughout the movement and are transformed through various transpositions and inversions. The third movement has a "swashbuckling" character and is very upbeat with various meter changes and rhythmic accents. The trumpet and piano parts become more complex as the movement progresses, finishing with a flurry of virtuosic activity.

⁴³ Brendan Collins, "Brendan Collins, Composer," accessed April 2, 2018, <https://www.brendancollins.com.au/biography>.

The Sound of Silence (1964) – Paul Simon (arr. Youngs)

Originally performed by the folk duo, Simon & Garfunkel, *The Sound of Silence* was first recorded in 1964 on their debut album, *Wednesday Morning, 3 A.M.* The album, however, was a failure and led to the break up of the duo. A year later, the song was overdubbed with electric instrumentation and the remix landed the No. 1 spot on the *Billboard* Top 100 list. This caused Simon & Garfunkel to reunite, recording their next album, titled *The Sounds of Silence* in 1966. Considered “culturally, historically, and aesthetically important” the song and entire album were added to the Library of Congress National Recording Registry.⁴⁴ In late 2015, the heavy metal band Disturbed recorded a unique cover of *The Sound of Silence*. This particular arrangement for flügelhorn and piano is based on the orchestration of the Disturbed cover, featuring the melody with varied accompaniments and *obbligato* passages in the flügelhorn. The arrangement ends with three *forte* sustained chords, reminiscent of church bells. This conclusion is meant to be an homage to the original album, *Wednesday Morning, 3 A.M.*, as if the listener is hearing the lonely toll of hourly church bells cutting through the silence.

Fête Joyeuse – Henri Dallier

French composer Henri Dallier (1849–1934) was both a composer and organist with important ties to the Paris Conservatory. At the famed institution, he studied with composer and organist César Franck, winning first prize in the “organ and fugue” competition in 1878. In 1879, Dallier became the “titulaire du grand orgue” of Saint-

⁴⁴ David Brackett, “Simon and Garfunkel,” *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000046625?rskey=cZi2Q2&result=1>.

Eustache. In 1905, he succeeded Gabriel Fauré as the organist of La Madeleine. Dallier has written a symphony, several works for organ and piano, as well a solo oboe piece. *Fête Joyeuse*, translated as “Joyous Festival,” remains his only work for trumpet and piano, and was used as the contest solo for the trumpet competition at the Paris Conservatory in both 1905 and 1930. The competitions held at the Paris Conservatory are a major aspect of the rich history of the famed music school. Students competed each year, playing works that were often composed by students and faculty for that specific year’s competition. *Fête Joyeuse* is believed to have been premiered at the 1905 competition, but was not copyrighted until the current edition was revised by in 1942 by Georges Mager, former principal trumpet with the Boston Symphony.⁴⁵ In typical contest solo fashion, the piece juxtaposes many contrasting moods. It features a bold opening, followed by a bouncy theme, and then a short lyrical section. The first joyful theme then returns with added development and triple tonguing, as the piece comes to an exciting close.

Sonata for Trumpet and Piano – Kent Kennan

American composer Kent Kennan (1913–2003) is known in music theory and composition circles for his two books, *Counterpoint* and *The Technique of Orchestration*. One of his last major compositions, *Sonata for Trumpet and Piano* was commissioned in 1954 by NASM and subsequently premiered by J. Frank Elsass at the NASM Convention

⁴⁵ Felix Raugel and David Charlton, “Dallier, Henri,” *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000007093?rskey=kNih1m&result=1>.

in 1955.⁴⁶ A revised edition was created in 1986, in which Kennan made significant changes to the meter and the barring of measures. All three movements of the work prominently feature motives of open fourths and fifths, which dominate many American compositions. The first movement opens with a motive containing a perfect fifth, followed by a major second. This motive is constantly transformed via transposition and inversion throughout the three movements. The first and third movements also feature a significant amount of mixed meter passages, including 5/8, 6/8, 8/8, as well as a great deal of syncopation in both the piano and trumpet parts. Kennan's work is one of many American compositions during the "post-war era," featuring bold proclamations and undeniable optimism for the future of America.

"Simple Song" from *Mass* – Leonard Bernstein

Leonard Bernstein (1918–1990) is one of the most famous conductors and composers in American history. He is most well-known as the conductor of the New York Philharmonic, and for his compositions *West Side Story* and *Candide*, among others. Bernstein composed *Mass* in 1971, after it was commissioned by Jacqueline Kennedy for the opening of the John F. Kennedy Center for the Performing Arts in Washington, D.C. *Mass* is a staged musical theater work, inspired by the Tridentine Mass of the Roman Catholic Church.⁴⁷ The liturgical passages are sung in Latin, with

⁴⁶ Jennifer Lorien Dearden, "The American trumpet sonata in the 1950s" (DMA diss., University of North Texas, 2007), accessed April 6, 2018, <http://ezproxy.uky.edu/login?url=https://search-proquest-com.ezproxy.uky.edu/docview/304814644?accountid=11836>.

⁴⁷ Paul R. Laird and David Schiff, "Bernstein, Leonard," *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-1002223796?rskey=mxO2FZ&result=6>.

additional English texts by Bernstein, Stephen Schwartz, and Paul Simon. “Simple Song” is the second out of 32 numbers in the large work, occurring directly after the active “Kyrie Eleison” introduction. It is usually performed by a solo male singer and opens with a recitative-like section, followed by a lyrical melody and text in praise of God. This version for flügelhorn and piano retains the original structure with piano accompaniment, intended for a concertized performance.

Marisa Youngs, Trumpet
In a DMA Chamber Recital

with Jason Dovel, Trumpet
David Elliott, Horn
Bradley Kerns, Trombone
J.D. Handshoe, Bass Trombone

Sunday, November 5th, 2017, 3:00 PM
Recital Hall, Singletary Center for the Arts
University of Kentucky

PROGRAM

Exaltation Brian Balmages
(b. 1975)

Dance Suite Michael Praetorius
Volta (1571–1621)
Ballet des Fues/Ballet arr. Dean
Ballet (Pavan)/Bransles

Baroque Suite Girolamo Fantini
Ricerca detta la Serriistori (1600–1675)
Ricerca detta la Torrigiani arr. Dovel
Ricerca detta la Lenzoni
Ricerca detta la Canigiani
Ricerca detta l/Albergotti

INTERMISSION

Three Dance Impressions Morley Calvert
With Dignity (1928–1991)
With Elegance
With Humor

Variations on My Old Kentucky Home Clay Smith
(1878–1930)
arr. Chaney

Selections from “West Side Story” Leonard Bernstein
Maria (1918–1990)
I Feel Pretty arr. Gale

A Nightingale Sang in Berkeley Square

Manning Sherwin
(1901–1969)
arr. Gale

Carolina in the Morning

Kahn/Donaldson
arr. Frackenpohl

PROGRAM NOTES

Exaltation – Brian Balmages

Brian Balmages (b. 1975) is well-known in the band and brass communities for his compositions for groups of all ability levels. Originally a trumpet player, Balmages received his undergraduate degree from James Madison University in Virginia and master's degree from University of Miami (Florida).⁴⁸ His music is tonal and the intricately woven together, creating a perceived complexity for the listener, but each individual part is often easily playable and idiomatic to each instrument. His works are full of rhythmic vitality as well as soaring melodic lines and *Exaltation* is no exception. Written during Balamages's college years, *Exaltation* is a short, exciting opener featuring a significant number of meter changes, often with different beaming between the parts to indicate varying pulse streams among the players. The piece begins with a syncopated interplay between the two trumpets, featuring a recurring main theme of open fourths in the first trumpet, reminiscent of themes from popular film soundtracks. The body of the piece displays exposed technical and lyrical solos in all parts, often in mixed meters and offset entrances to peak the listener's interest. The work concludes with a recapitulation of the opening theme and a strong finish by the entire ensemble.

Dance Suite – Michael Praetorius (arr. Dean)

A prolific composer, organist, and music scholar, Michael Praetorius (1571–1621) contributed significantly to musical life during the Renaissance Era. His works include a

⁴⁸ Brian Balmages, "FJH Music Company, Composers & Writers," accessed April 2, 2018, <https://www.fjhmusic.com/composer/bbalmages.htm>

great deal of liturgical music for the Lutheran church, as well as *Missodia Sionia* (a large collection of vocal works) and *Terpsichore*, a collection of over 300 secular instrumental dances.⁴⁹ The arranger, Allan Dean, is the current trumpet professor at Yale University and a well-known performer on historical brass instruments. *Dance Suite*, arranged for the St. Louis Brass Quintet, contains four dances of varying styles and moods. In addition to the five brass, Dean also included percussion instruments to be played by the performers. The addition of tambourine, small drum, and triangle are written directly into each brass part and add significantly to the unique character of the arrangement, while also providing a small endurance break for each performer.

Dance Suite begins with “Volta” in a moderately fast triple meter, felt in one. As with many of the movements in the suite, “Volta” features repeated sections with varied dynamics and some parts are indicated to play only on the repeat, creating a variation in texture. The second movement, “Ballet des Fues,” features a lengthy articulate solo in the horn part. The third movement, “Ballet (Pavan)/Bransles,” features a beautiful subdued melody stated in the first trumpet and later transferred to the trombone, accompanied by the steady beat of a small drum. The ensuing sections are repeated and accompanied by tambourine, becoming progressively faster until the exciting, abrupt conclusion of the movement. The suite ends with a fourth movement, a reprise of the “Volta,” which was not performed on this program.

⁴⁹ Walter Blankenburg and Clytus Gottwald, “Praetorius, Michael,” *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000022253?rkey=TQ5izn&result=1>.

Baroque Suite – Girolamo Fantini (arr. Dovel)

Girolamo Fantini (1600–1675) is one of the most important figures in the development of the trumpet in art music. In 1631, Fantini became the chief trumpeter of the court of the duke of Tuscany, Ferdinando II. Fantini is believed to have given the first performance of a piece for solo trumpet and keyboard, accompanied by Frescobaldi. His trumpet method, *Modo per imparare a sonare di tromba*, is a significant historical resource, as it contains the first known works for trumpet and keyboard accompaniment.⁵⁰ This arrangement by Jason Dovel features a soloist playing Baroque trumpet, using a valveless natural trumpet or very similar instrument with vent holes for intonation. The remaining four brass players in the quintet accompany the soloist. The soloist's part is in the key of C, but is set in the Baroque pitch of 415hz, which puts the quintet in the concert key of B major for the majority of the piece. Each of the five movements is from several of Fantini's "ricercatas," which are short works with an improvisatory or cadenza-like mood for the soloist. From the term "ricercar," these movements were common during the Baroque era beginning as an unaccompanied melody that can be heavily ornamented, often with diatonic scale patterns.⁵¹ This arrangement allows the soloist to improvise on the Baroque trumpet and is a unique addition to the brass quintet repertoire.

⁵⁰ Edward H. Tarr, "Fantini, Girolamo," *Grove Music Online*, edited by Deane Root, accessed April 3, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000009297?rskey=ebur2P&result=1>.

⁵¹ Denis Arnold, "ricercar," *The Oxford Companion to Music*, Oxford University Press, 2011, accessed March 27, 2018, <http://www.oxfordreference.com.ezproxy.uky.edu/view/10.1093/acref/9780199579037.001.0001/acref-9780199579037-e-5640>.

Three Dance Impressions – Morley Calvert

A versatile musician, Morley Calvert (1928–1991) was a Canadian composer, arranger, conductor, and music educator born in Brantford, Ontario. Calvert first earned an associate's degree in music from McGill University and later completed a bachelor's degree at the same institution in 1956. In 1958, Calvert founded the Montereian Music Camp, a summer training camp for young high school musicians. Many brass chamber musicians have performed Calvert's brass quintet work, *Montereian Hills* (1961), which is a reference to the nearby mountain range of the same name. He was also an active band and choral conductor, founding the first McGill University Concert Band and the Lakeshore Concert Band in the early 1960s.⁵²

While many of Calvert's other compositions feature traditional melodies and Canadian folks songs (such as *Suite of Canadian Folk Songs* for concert band), *Three Dance Impressions* is a highly rhythmic work, featuring syncopations and odd meters. The work seems to use the term "dance" in the title in an ironic manner, as the rhythmic irregularities would make Calvert's melodies extremely difficult to physically dance. In addition, the movement titles imply varying moods, instead of using actual dance forms as titles. The first movement, "With Dignity," has an intense opening in triple meter with accented solo passages in all instruments. The second movement, "With Elegance," is in a relaxed compound meter and contains a beautiful *legato* melody passed among the majority of the instruments in the quintet. To conclude the work, Calvert's final movement, "With Humour," is written in 5/8 with the duple versus triple subdivisions switching every measure (2+3, 3+2, 2+3, 3+2, etc.). This can prove to be difficult when

⁵² "Morley Calvert," *Historica Canada*, 2013, <http://www.thecanadianencyclopedia.ca/en/article/morley-calvert-emc/>.

counting rests during another instrument's solo passage, giving the work added complexity. With constant dynamic changes and an unexpected pause before the last several notes of the piece, the irony of Calvert's "dances" is certainly felt by the audience.

Variations on My Old Kentucky Home – Clay Smith

Originally a folk song by Stephen Foster, this version of *My Old Kentucky Home* is based on the solo work, *Air Varie*, written by Clay Smith in 1914.⁵³ Smith's arrangement is now available for many solo instruments with piano, wind band, and brass band accompaniment. This particular arrangement features the trombone as a soloist with the remaining four players of a brass quintet as the accompanying voices. Beginning with a bold introduction by the entire ensemble, the piece then continues in the same manner many theme and variations. The trombonist begins the solo with the original melody from *My Old Kentucky Home* in a lyrical, song-like manner as the main statement of the theme. As the piece continues, the melodic variations in the solo part become progressively more difficult and encompass a wide variety of musical styles. The variations include a march, an expressive *legato* section, an articulate single-tongued section, then ends with an impressive flourish of triple-tonguing as the ensemble joins the soloist in a *forte* conclusion.

⁵³ Clay Smith, *Old Kentucky Home – Air Varie*, Oskaloosa, IA: C. L. Barnhouse, 1914.

Selections from “West Side Story” – Leonard Bernstein (arr. Gale)

Known for his reputation as a conductor and composer, Leonard Bernstein was arguably one of the most influential musicians of the 20th Century. As a young man, Bernstein was appointed conductor of the New York Philharmonic and later conducted many of the world’s leading orchestras. His compositions include a number of orchestral works, as well as *Chichester Psalms* for choir and orchestra and the orchestral scores to the famous movies *On the Town* and *West Side Story*.⁵⁴ Bernstein later adapted the music from *West Side Story* into a suite for orchestra titled *Symphonic Dances from West Side Story*. Arranger Jack Gale then used selections from the suite for this brass quintet arrangement. The suite includes many of the original pieces, but only “Maria” and “I Feel Pretty” were selected for this program. “Maria” is one of the most well-known songs from the musical, often utilizing the unique interval of a tritone on the name “Maria” in the melody. Gale’s arrangement opens with the melody slowly stated in the horn, then in the other instruments as the pace of the movement shifts into a faster cut time feel. The other selection on the program, “I Feel Pretty,” is a lighthearted movement featuring the melody in several instruments, including a full statement in the bass trombone/tuba part. Gale’s arrangement also adds a version of the melody with the first trumpet at a loud dynamic in the upper register, reminiscent of the lead trumpet demands that were present throughout the original score. Although Gale’s full arrangement contains all of the main songs from *West Side Story*, any of the movements can be played individually or in a different order to add variety to a chamber program.

⁵⁴ Paul R. Laird and David Schiff, “Bernstein, Leonard,” *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-1002223796?rskey=mxO2FZ&result=6>.

A Nightingale Sang in Berkeley Square – Manning Sherwin (arr. Gale)

A Nightingale Sang in Berkeley Square was written in 1939 by Manning Sherwin with original lyrics by Eric Maschwitz. The “Berkeley Square” (pronounced “bark-lee”) referenced in the title is a large outdoor square in Mayfair, an upscale part of London, England.⁵⁵ Nightingales are known to be tuneful songbirds and the addition of the bird in the title evokes a specific image for the listener. Also arranged by Jack Gale, the piece begins with a short horn solo, followed by the main melody introduced by the first trumpet. To add timbral variety, this particular performance featured both trumpeters playing flugelhorns instead of B-flat trumpets. Each instrument then has a short solo throughout the work, which utilizes very compact, clustered harmonies in the accompanying voices. The piece has a great deal of dissonances that are quickly resolved, creating added chordal harmonies common in jazz styles.

Carolina in the Morning – Kahn/Donaldson (arr. Frackenpohl)

Originally written in 1932, *Carolina in the Morning* was a popular song by song-writing duo, Gus Kahn and Walter Donaldson.⁵⁶ This brass quintet arrangement by Arthur Frackenpohl is part of a collection of three works, *Carolina Trio*, which includes other pieces *Charleston* and *Dinah*. Born in 1925, Frackenpohl attended the Eastman School of Music for both his Bachelor of Arts and Master of Arts degrees, then went on to receive a Doctor of Musical Arts degree from McGill University in 1957. During his

⁵⁵ Edward Walford. "Berkeley Square and its neighbourhood," *Old and New London: Volume 4*, (1878): 326-338. *British History Online*, accessed March 27, 2018, <http://www.british-history.ac.uk/old-new-london/vol4/pp326-338>.

⁵⁶ Michael J. Budds and Maristella Feustle, “Kahn, Gus(tav Gerson),” *Grove Music Online*, edited by Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e1002266986?rsk=E7ufB8&result=3>.

education, he also attended summer composition workshops, where studied with Darius Milhaud and Nadia Boulanger. He has written over 400 works, for both young and advanced instrumental ensembles, including arrangements made famous by the Canadian Brass.⁵⁷ Frackenpohl's short arrangement of *Carolina in the Morning* begins in a slow swing style for the first half of the piece, then moves to an upbeat swing dance as a conclusion. Throughout much of the piece, the tuba acts as a string bass, while the two trumpets play the majority of the melody.

⁵⁷ David Cope and Elisa Weber, "Frackenpohl, Arthur," *Grove Music Online*, edited by Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-1002284349?rskey=EbnsOO&result=1>.

Marisa Youngs, Trumpet
In a DMA Trumpet Recital

with Jacob Coleman, Piano
Makeda Hampton, Soprano

February 3rd, 2018, 5:00 PM
Recital Hall, Singletary Center for the Arts
University of Kentucky

PROGRAM

“Let the Bright Seraphim” from *Samson* (1741) G. F. Handel
(1685–1759)

Makeda Hampton, Soprano

Siete Canciones Populares Españolas (1914) Manuel de Falla
(1876–1946)
I. El Paño Moruno
III. Asturiana trans. Amanda Pepping
II. Seguidilla murciana
V. Nana
VII. Polo

Concertpiece No. 2, Op. 12 Vassily Brandt
(1869–1923)

INTERMISSION

Fantasietta (1950) Marcel Bitsch
(1921–2011)

Song Cycle for Trumpet Unaccompanied (2016) Michael Cotten
(b. 1994)
I. A Tale Begins
II. Butterflies in the Redwoods
III. Flowering Song
IV. A Waltz Remembered
V. The Tale Ends

Nightsongs (1974) Richard Peaslee
(1930–2016)

PROGRAM NOTES

“Let the Bright Seraphim” from *Samson*– G. F. Handel

In the Fall of 1741, only weeks after writing the famed *Messiah*, G. F. Handel (1685–1759) launched into composing his next oratorio, *Samson*. The libretto, adapted by Newburgh Hamilton, is based on John Milton's dramatic poem, *Samson Agonistes* (Greek for "Samson, the Agonist").⁵⁸ The work describes the Biblical story of the hero Samson, an Israelite man (Nazirite by birth) who possesses the gift of supernatural strength from God. At the time, the Israelites were constantly at war with a neighboring tribe of people known as the Philistines. Samson's downfall begins when he falls in love and marries Delilah, a beautiful Philistine woman. The leaders of the Philistines approach Delilah and offer her money to determine what causes Samson to have such great strength, so they can finally defeat the Israelites. Delilah manipulates Samson into divulging the secret of his strength: the fact that his hair has never been cut off. Delilah then tells the Philistines of Samson's one weakness and they subsequently cut off his hair while he sleeps. Samson loses all of his strength and the Philistines blind him and put him in prison. After some time in captivity, the Philistines decide to bring Samson to a large religious celebration, to display their triumph over his strength. At the temple, Samson is brought out in front of a crowd of several thousand. While in captivity, Samson's hair had begun to grow back and he fervently prays to God to renew his strength. God answers his prayer

⁵⁸ Anthony Hicks, "Handel, George Frideric," *Grove Music Online*, Published 2001, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000040060?rskey=JKCl0c&result=1>.

and Samson pulls down the pillars of the temple upon himself and the entire crowd of Philistines.⁵⁹

Despite the rather depressing end to this tale, Handel wrote a rather joyful setting of “Let the Bright Seraphim” (and its ensuing chorus) for the end of his oratorio, as Samson’s sacrifice is seen as a triumph for the Israelites. The work is originally scored for solo soprano voice, solo trumpet, strings, and basso continuo. In a traditional *da capo* form (A-B-A), the aria features an upbeat “A” section, a contrasting and more subdued “B” section in the relative minor key, and a full repeat of the opening “A” material. Performance practice in the Baroque gives both soloists the liberty of ornamentation in the returning “A” section, which was typical of *da capo* arias. The libretto (reproduced below), references the “Angel’s trumpets,” while both solo parts feature music often found in trumpet parts from the Baroque era, including arpeggiated gestures and flowing melodic lines. The opening vocal melody mimics the trumpet’s ascending arpeggio, giving the main theme a fanfare quality that is appropriate for the text.

“Let the Bright Seraphim” libretto:

Let the bright Seraphim in burning row,
their loud, uplifted Angel-trumpets blow.
Let the Cherubic host, in tuneful choirs,
touch their immortal harps with golden wires.⁶⁰

⁵⁹ Gregory Mobley, “Samson, the liminal hero: A comparative study of judges 13-16 and ancient near eastern heroic tradition,” (Ph.D. diss., Harvard University, 1994), accessed April 6, 2018, <http://ezproxy.uky.edu/login?url=https://search-proquest-com.ezproxy.uky.edu/docview/304124122?accountid=11836>.

⁶⁰ George Frideric Handel, *Samson (HWV 57)*, Edwin F. Kalmus & Co.: ed. 1933.

Siete Canciones Populares Españolas – Manuel de Falla (trans. Pepping)

Composed in 1914, Manuel de Falla's (1876–1946) *Siete Canciones Populares Españolas* (translated as “Seven Spanish Folksongs”) is a set of art songs for soprano voice and piano. Originally dedicated to Madame Ida Godebska, the songs are considered to be the most performed Spanish-language works in the repertoire. The song set displays a wide variety of folk music and the first four songs reference some of the indigenous cultures and various geographical regions throughout Spain. “El Paño Moruno” (“The Moorish Cloth”) refers to the Moor people of Spain, generally considered a nomadic immigrant tribe from North Africa. “Seguidilla murciana” references a type of Flamenco dance, the “seguidilla,” originating from the Southeast region of Murcia.⁶¹ “Asturiana” refers to scenery found in the Northern region of Asturias.⁶² Although not performed on this program, the fourth song in the set, “Jota,” is a type of dance and musical genre from the Northeast region of Aragón.⁶³ In addition to the geographical and cultural folk songs, there is also the “Nana” (a lullaby), the “Canción,” which translates to “song” (not performed on this program), and “Polo,” which describes the pain of an embittered lover that has been betrayed. English translations from the original Spanish text are reproduced on the following page.

⁶¹ Jihyun Park, “A Study of *Siete canciones populares españolas* by Manuel de Falla,” (PhD diss., University of Kansas, 2013), 11.

⁶² Jihyun Park, “A Study of *Siete canciones populares españolas*,” 14.

⁶³ Jihyun Park, “A Study of *Siete canciones populares españolas*,” 18.

Translations*

Spanish

“El Pano Moruno”
Al paño fino, en la tienda,
una mancha le cayó;
Por menos precio se vende,
Porque perdió su valor. ¡Ay!

“Asturiana”
Por ver si me consolaba,
Arrime a un pino verde,
Por ver si me consolaba.
Por verme llorar, lloraba.
Y el pino como era verde,
Por verme llorar, lloraba.

“Seguidilla Murciana”
Cualquiera que el tejado
Tenga de vidrio,
No debe tirar piedras
Al del vecino.
Arrieros semos;
¡Puede que en el camino Nos encontremos!
Por tu mucha inconstancia
Yo te comparo
Con peseta que corre
De mano en mano;
Que al fin se borra,
Y creyéndola falsa
¡Nadie la toma!

“Nana”
Duérmete, niño, duerme,
Duerme, mi alma,
Duérmete, lucerito
De la mañana.
Nanita, nana,
Nanita, nana.
Duérmete, lucerito
De la mañana.

“Polo”
¡Ay!
Guardo una, ¡Ay!

English

“The Moorish Cloth”
On the fine cloth in the store
a stain has fallen;
It sells at a lesser price,
Because it has lost its value. Alas!

“Asturiana”
To see whether it would console me,
I drew near a green pine,
to see whether it would console me.
Seeing me weep, it wept;
And the pine, being green,
seeing me weep, wept.

“Seguidilla Murciana”
Who has a roof
of glass
should not throw stones
To their neighbor’s (roof).
Let us be muleteers;
It could be on the road we will meet!
For your great inconstancy
I compare you
to a coin that runs
from hand to hand;
which finally blurs
and believing it false,
no one accepts!

“Nana”
Go to sleep, child, cleep
Sleep, my soul,
Go to sleep, little star
Of the morning.
[Lulla-lullaby]
[Lulla-lullaby]
Sleep little star
Of the morning.

“Polo”
Ay!
I keep a... Ay!

Guardo una, ¡Ay!	I keep a... Ay!
¡Guardo una pena en mi pecho,	I keep a sorrow in my breast
¡Guardo una pena en mi pecho,	I keep a sorrow in my breast
¡Ay!	Ay!
Que a nadie se la diré!	That to no one will I tell.
Malhaya el amor, malhaya,	Wretched be love, wretched,
Malhaya el amor, malhaya,	Wretched be love, wretched,
¡Ay!	Ay!
¡Y quien me lo dió a entender!	And he who gave me to understand it!
¡Ay!	Ay!

*Translations from Español (Spanish) to English courtesy of Claudia Landivar Cody, copyright ©2003.⁶⁴

Concertpiece No. 2, Op. 12 – Vassily Brandt

Born in Germany, Vassily (Willy) Brandt (1869–1923) immigrated to Russia as a young man and became a well-known trumpet player and teacher. He began his Russian career as the principal trumpet of the Bolshoi Theater and is known for his *34 Orchestral Études*, which continue to be an important pedagogical resource for trumpet players today.⁶⁵ Brandt’s *Concertpiece No. 2* is in the style of a flashy competition piece, much like those originating from the Paris Conservatory in the 20th Century. The work begins with a bold opening of lyrical and technical passages, which sets the stage for the various contrasting sections that follow. Flowing lyrical melodies are featured, as well as a distinguished march-like section, and the obligatory flurry of a fast, technical conclusion, featuring double tonguing and rapid scale passages.

⁶⁴ Claudia Landivar Cody, “Siete Canciones Populares,” *The LiederNet Archive*, accessed January 21st, 2018, http://www.lieder.net/lieder/assemble_texts.html?SongCycleId=285
http://www.lieder.net/lieder/assemble_texts.html?SongCycleId=285.

⁶⁵ Edward H. Tarr, “Brandt, Willy (Vassily),” *Grove Music Online*, ed. Deane Root, accessed April 2, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000043967?rskey=glOW8u&result=1>.

Fantasietta – Marcel Bitsch

French composer Marcel Bitsch (1921–2011) was a student and later professor at the Paris Conservatory. Many trumpet players are familiar with his work from his *Vingt Études pour Trompette*. Much like these études and Bitsch’s other instrumental compositions, *Fantasietta* utilizes dissonance and chromaticism throughout the short work. This very short piece opens with a fanfare and cascading sixteenth notes, followed by a lyrical theme that meanders through various chromatic harmonies. The rhythmic fanfare then reappears in altered forms as the piece rushes to an exciting and abrupt finish.

Song Cycle for Trumpet Unaccompanied – Michael Cotten

In the composer’s words, this song cycle captures “an essence of the dramatic art of storytelling.”⁶⁶ Told in five parts, the cycle attempts to depict an old man telling a story of two lovers. The first movement, “A Tale Begins (The Old Man Begins His Tale),” gives a bold and dramatic introduction to the performer’s story. The second movement is titled “Butterflies in the Redwoods (Two Begin a Walk To Leave As One)” and features soft trills depicting butterflies fluttering up through the trees. According to the composer, this movement has a two-fold meaning. It refers to the literal butterflies flitting through the Redwood trees, but also has an underlying meaning of the “butterflies” of nervousness or excitement that one feels when beginning a new relationship. Movement three, “Flowering Song (Love Blossoms and Inevitably Fades),” is in a singing style with flowing melodic lines. The fourth movement is titled “A Waltz

⁶⁶ Michael Cotten, *Song Cycle for Trumpet Unaccompanied*, unpublished score, 2016.

Remembered (The Lover Dances with Hands Wrapped around the Waist of a Memory).” This section is written in the 3/4 meter of a typical waltz, but the composer has indicated the performer should play this with a “stuttering sense of time,” as if there is a slight hitch in the lover’s remembrance of the dance. The final movement, “The Tale Ends,” is subtitled “We End the Heartache and the Thousand Natural Shocks That Flesh Is Heir To.” It begins with a dramatic fanfare, which briefly morphs into a lively 12/8 dance. The piece ends with the dramatic fanfare motive slowly fading into resignation, as the past love can never fully be erased from memory.

Nightsongs – Richard Peaslee

A native of New York City, Richard Peaslee earned degrees in composition from both Yale University and The Juilliard School and also studied with famous composers Nadia Boulanger and William Russo.⁶⁷ Peaslee’s music draws from many genres, including jazz and electronic music, and his solo instrumental compositions tend to explore extended techniques unique to each instrument.

Written for commercial trumpeter Harold Lieberman, *Nightsongs* is a single-movement work that encompasses a variety of textures and moods in both the solo part and accompaniment. The solo part is written for both B-flat trumpet and solo flugelhorn, although the score specifies the performer may choose to play only one instrument or switch between the two where indicated. Peaslee’s original accompaniment was for string orchestra and features a great deal of solo harp, but the work is also performed with piano

⁶⁷ Joseph Brumbeloe, “Peaslee, Richard Cutts,” *Grove Music Online*, ed. Deane Root, accessed March 25, 2018, <http://www.oxfordmusiconline.com.ezproxy.uky.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000047265>.

accompaniment. The piece begins with a low, haunting introduction that slowly blossoms into a beautiful, yearning melody in the solo flugelhorn. The texture soon changes to a disjunct, nearly 12-tone approach in the accompaniment, as the soloist switches to B-flat trumpet and performs aggressive leaps and extended techniques, such as *tremolos*, trills, and flutter-tonguing. A lyrical theme follows, ending in a cadenza-like passage. Suddenly, an intense energetic section abruptly takes over, featuring technical and articulate lines in the trumpet. The piece ends with a flowing flugelhorn melody reminiscent of the opening solo, as the piece slowly fades back into the night.

Marisa Youngs
In a DMA Lecture

“The Language of Music: Linguistics in Trumpet Pedagogy”

Sunday, April 8th, 2018, 6:30 PM
Niles Gallery, Fine Arts Library
University of Kentucky

PROGRAM

- I. Introduction
- II. Research Process
- III. Experimental Design
- IV. Data Collection
- V. Live Ultrasound Demonstration
~ assisted by Taylor Gustad
- VI. Data Analysis
- VII. Experiment Conclusions
- VIII. Personal Observations
- IX. Questions & Comments

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Master of Music, Trumpet Performance – Boston University (Boston, MA)	2013 – 2015
Bachelor of Science, Music Education (Summa Cum Laude) – Indiana University of Pennsylvania (Indiana, PA)	2009 – 2013

Awards and Honors

National Trumpet Competition Graduate Solo Division Semi-Finalist	2018
National Trumpet Competition Trumpet Ensemble Division Semi-Finalist	2018
University of Kentucky School of Music Teaching Assistantship	2015 – 2018
Australasian Trumpet Academy Top Prize for Outstanding Musicianship	2017
Australasian Trumpet Academy Orchestral Excerpts Competition – 3 rd Place	2017
Historic Brass Society – Joe R. & Joella F. Utley Award	2017
University of Kentucky Graduate School Academic Fellowship	2015 – 2016
Boston University School of Music Teaching Assistantship	2014 – 2015
Boston University School of Music Scholarship	2013 – 2014
Virginia’s Blue Ridge Music Festival Concerto Competition Winner – <i>Trumpet Concerto in E-flat</i> by Franz Joseph Haydn	2013
International Trumpet Guild Conference Scholarship	2011 – 2012
Indiana University of PA Concerto Competition Winner – <i>Concerto for Trumpet</i> by Alexander Arutiunian	2011