Regulating Vocal Load in High Impact Production

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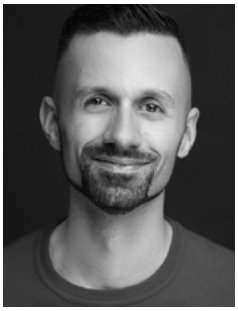

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Journal of Singing, May/June 2022
Volume 78, No. 5, pp. 601–607
https://doi.org/10.53830/OMOO7954

INTRODUCTION

The pop/rock canon is, perhaps, one of the most challenging genres to teach effectively. Despite the fact that so few degree programs formally train teachers and coaches to work within these styles, the world of pop/rock is inclusive of myriad subgenres, including but not limited to motown, 70s folk/rock, disco, 80s pop/rock, hip-hop, r&b, punk rock, country, faerie, and Latin pop. When comparing the vocalisms and stylistic attributes of artists such as Aretha Franklin and Dolly Parton, Aerosmith and Jason Mraz, or The Beatles and Green Day, for instance, it is rather difficult to argue the significant breadth of approaches present. As such, appropriately guiding singers can become particularly overwhelming. One of the greatest hurdles in the field of CCM singing is the absence of a systematic pedagogic approach that accounts for both stylistic considerations and vocal health.[1]

Unlike the industries of opera and musical theater, the world of popular music places great emphasis on resisting the vocal status quo. Singers are encouraged to embrace their own unique vocal footprint, often with little consideration for the level of balance (or imbalance) in their approach. This creates a great list of challenges in the pedagogic setting, as voice teachers are regularly tasked with deciphering which vocal faults to address and which are a desired and necessary piece of a student's vocal profile. Adopting assessment tactics that are built upon objective (rather than subjective) measures will enable a more inclusive and open minded approach. "Is what I am hearing efficient?" If so, "Is it sustainable?"

In order to ensure optimal efficiency and sustainability through vocal production in any style, it is imperative to consider each genre's unique stylistic demands and examine the processes by which we guide singers to explore both vulnerability and authenticity in their performances. A primary point of consideration is first to investigate vocal load. In the world of voice pedagogy and voice science, the presence and frequency of "vocal load," "vocal loading," "vocal effort," and "vocal fatigue" often appear to be used interchangeably with blurred distinctions.[2] For the purpose of this discussion, we will define vocal load as vocal demand.

High impact production can be most easily defined as any technical approach that perpetuates an added and sustained level of stress at the vocal fold level. As such, the adductory pattern of the vocal folds must be carefully

considered. In pop/rock styles, high impact production is easily measured by the infiltration of stylistic attributes that create an imbalance in the mechanism and help to provide the necessary authenticity in a particular style. The presence of rock cries, cracks, pops, growls, glottal onsets, aspirated offsets, excessive breathiness, and fry phonation, are often necessary components of production. Balancing vocal load, however, is heavily dependent upon one's ability to recognize the impact of each stylistic nuance as well as the potential for sustainability in light of their recurring presence.

FOUNDATIONAL ELEMENTS

It is essential to carefully consider the two foundational pillars of production—technique and style. According to voice pedagogue Robert Edwin, technique should serve the genre and function as the foundation which enables style to exist.[3] When working within the pop/rock canon, this is an especially important area of consideration due to the vast array of styles present. Simply put, technique functions as a replication of process—a process that we can easily equate to baking. If the ingredients of a recipe are carefully measured, the oven temperature and timing are appropriately calibrated, and each step is thoughtfully executed, the product will, more often than not, result in a consistent and favorable outcome.

Without the appropriate foundational elements of production in place, stylistically informed technical alterations may not be easily implemented in order to accommodate the demands of each unique genre. In order to achieve true authenticity in each style, special considerations need to be made in regard to a lowered soft palate, modest pharyngeal space, and an elevated laryngeal position, specifically in those styles that require the utilization of significant belt function.

Perhaps the most important area of consideration is that of the larynx. The larynx can be identified by its three divisions: the supraglottis, glottis, and subglottis. Within each of these three divisions, the musculature, neurovascular, and cartilages are intermingled to allow the larynx to function effectively.[4] These primary functions of the larynx include protection of the airway, swallowing, and voice production. Voice production is handled by the internal musculature. The lateral cricoarytenoid, thyroarytenoid, interarytenoid, and cricoarytenoid all work collaboratively to facilitate the adduction of the vocal folds. The posterior cricoarytenoid is responsible for abduction. A keen sense of laryngeal awareness is necessary in order to achieve both efficiency and sustainability through these processes, especially in those styles with a greater demand for high impact production. Laryngeal elevation and vocal sustainability are inextricably linked and will be informed by both pitch and vowel.

MANIPULATING REGISTRATION

It also is necessary to consider the ways in which we guide singers to manipulate various elements of their production. Vowel choices will directly impact a singer's ability to navigate issues of registration. This is due to the fact that vowels impact the ratio of interplay between the thyroarytenoid and cricothyroid muscles. Thyroarytenoid-dominant function will result in a chest-dominant approach, whereas cricothyroid-dominant function will produce a head-dominant sound. In pop/rock styles, the utilization of open vowels in Mode 1 will keep the mechanism in an open posture and result in a delay of the *primo passaggio*, specifically in AFAB (assigned female at birth) singers. Many AFAB singers can utilize this approach up to and surrounding C_5 and D_5, at which point the voice seldom will continue to respond to the significant level of openness, pressure, and stress placed upon the thyroarytenoid muscle. Often, this will result in a sudden flip into Mode 2. While this flip can be stylistically appropriate and even desirable in certain instances, it is imperative to consider the ramifications of this extreme vocal loading, particularly in this high tessitura.

AMAB (assigned male at birth) singers have a similar experience when approaching the *secondo passaggio*. The desire to keep vowels open will result in a continuous thyroarytenoid-dominant approach, thus delaying the introduction of any significant level of cricothyroid engagement, as well as the introduction of turn or cover. While it likely is inappropriate to implement the use of cover in most pop/rock styles, a slight turn of the voice by way of a more narrow vowel will allow the instrument to recalibrate by facilitating a slightly tilted laryngeal position. This will also cultivate a more balanced wear of laryngeal muscles. As the vocal load is more evenly

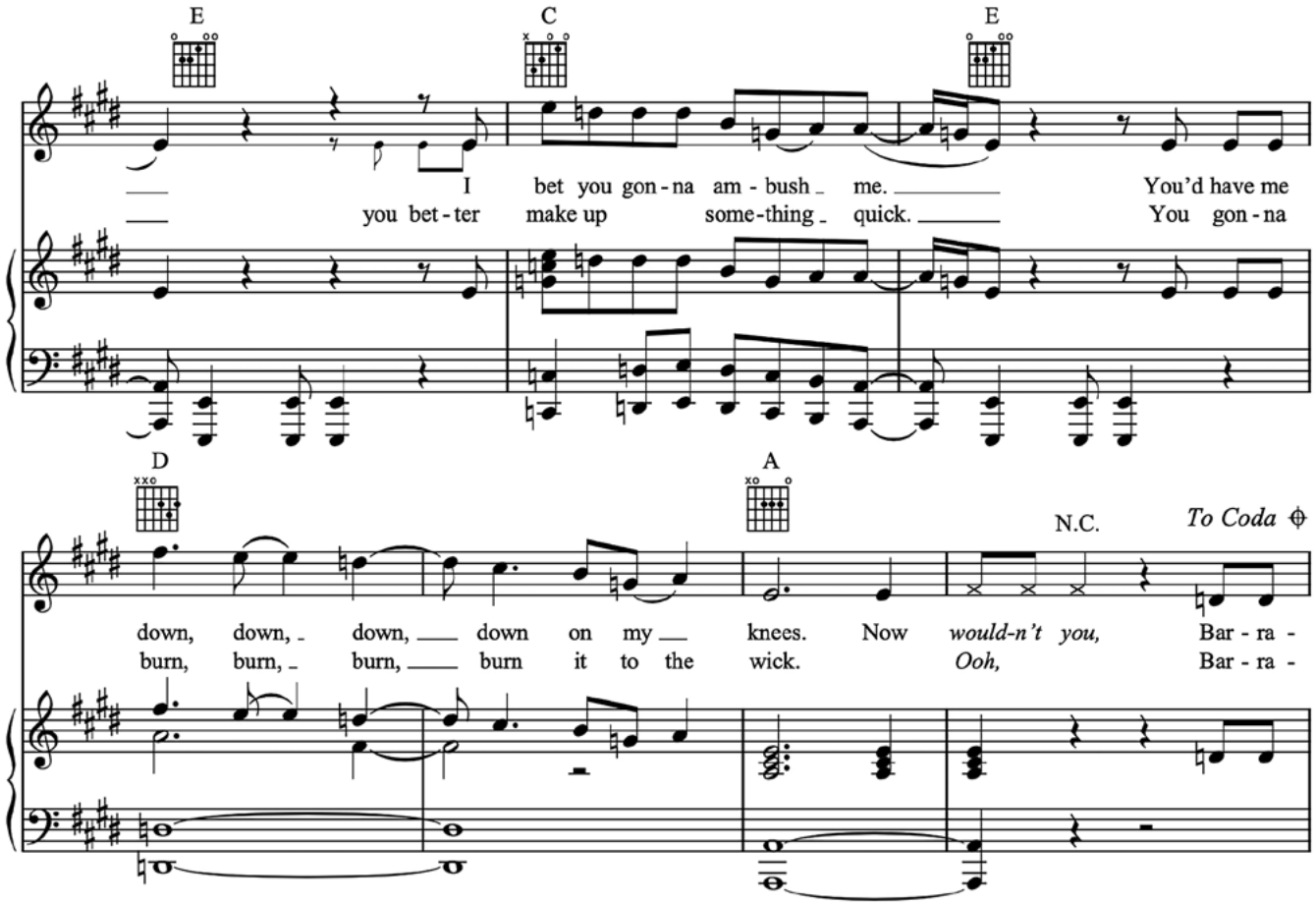
distributed between both the thyroarytenoid and cricothyroid muscles, the duration of production can be extended. This balanced approach will result in a greater sense of efficiency and sustainability.

Implementing the use of narrowed vowels in pre-*passaggi* zones will cultivate dual functionality of laryngeal muscular engagement and result in a more efficient and sustainable mix. Table 1 provides a list of commonly utilized open vowels and suggestions for narrowed vowel counterparts. It is worth mentioning that all adjustments must also be carefully considered based on the tessitura, approach, and proximity to *passaggi* points.

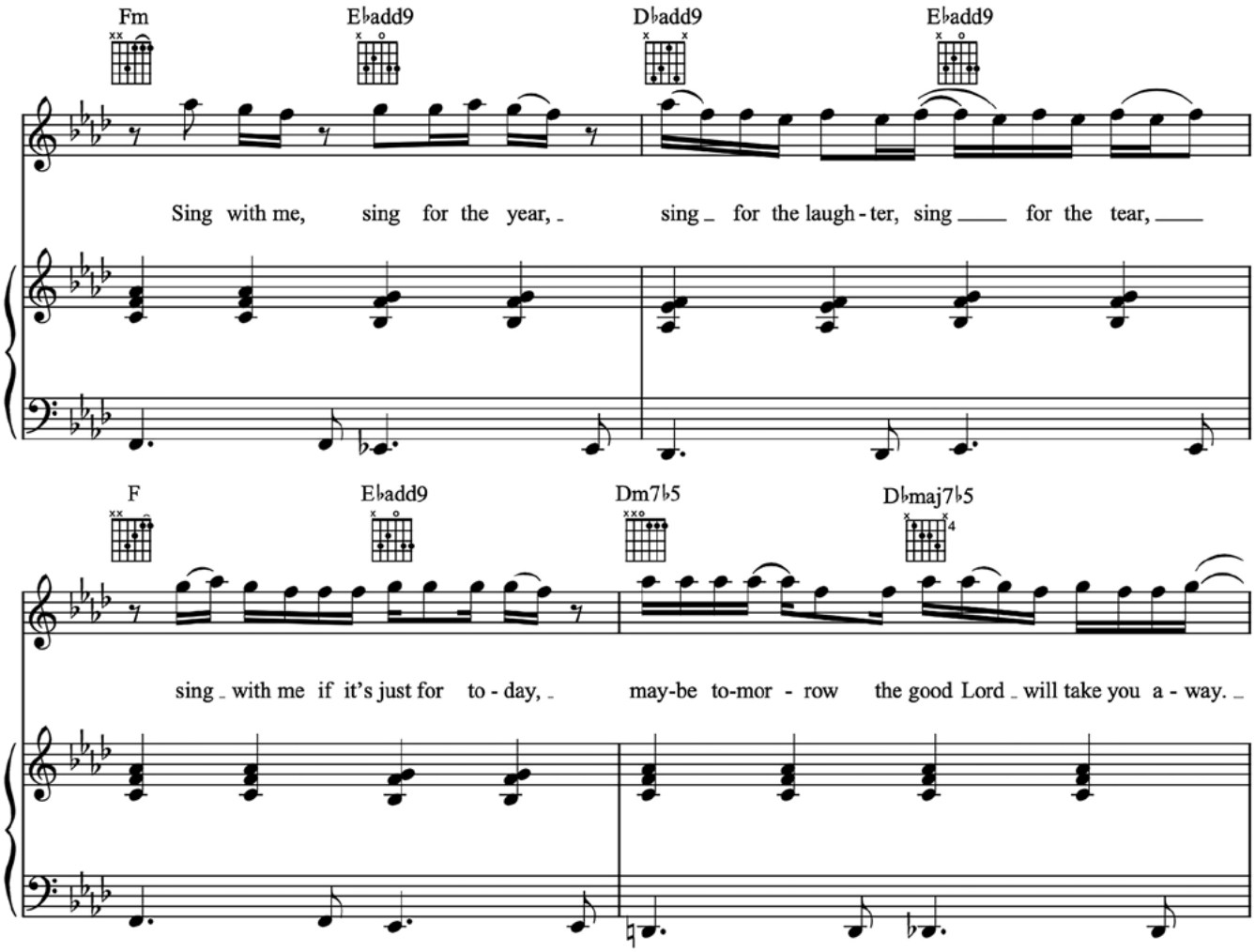
In the song, "Barracuda," as performed by Heart, the vocal line jumps from an E_4 to an $F^{\#}_5$ with a call for the utilization of a heavy belt mechanism during the end of the chorus. The text includes, "You'd have me down, down, down on my knees" (Example 1). In this example, the appropriate modification for the /ɑ/ on the word "down" would be /æ/, as shown in Table 1. This vowel substitution facilitates a greater sense of duality between the thyroarytenoid and cricothyroid muscles at this point in the AFAB voice. This approach cultivates a head or cricothyroid-dominant mix that one would perceive as a full belt as a result of the added boost in acoustic energy.

TABLE 1. Critical vowel substitutions.

Open Vowels	Narrowed Vowel Substitutions
/ɑ/ = "mop"	/æ/ = "nah" or /ɔ/ = "aww"
/ɛ/ = "bed"	/e/ = "der" (German) or /æ/ = "nah"
/I/ = "sit"	/i/ = "mean" or /æ/ = "nah"
/ʊ/ = "book"	/u/ = "who"



Example 1. Excerpt from "Barracuda," by Ann Wilson, Nancy Wilson, Roger Fisher, and Michael Derosier (as performed by Heart).



Example 2. Excerpt from "Dream On," by Steven Tyler (as performed by Aerosmith).

In addition to /æ/, a number of the aforementioned vowel substitutions in Table 1 also provide numerous acoustic advantages. As vowels manipulate the shape of the vocal tract, there is a direct impact on the acoustic properties within the sound due to the alteration of resonance. The traditional musical theater belt sound has been described with considerable reinforcement of the second harmonic by the first resonance of the vocal tract.[5] The vowels /a/ and /æ/ allow this reinforcement at pitches in the G_4 to E_5 range. According to a recent study conducted by voice scientist, Dr. Ingo Titze, the fourth harmonic can be reinforced with the second resonance of the vocal tract on the vowels /i/ and /e/. In the more contemporary pop/rock belt aesthetic, /æ/ provides numerous noteworthy benefits, as well, including both the significant boost in acoustic energy as well as a harmonious engagement of laryngeal muscles.

A second illustration is "Dream On," as performed by Aerosmith. As shown in Example 2, the text, "Sing with me, sing for the year, sing for the laughter, sing for the tear," presents a number of significant challenges for the AMAB voice. First, the text-driven and necessary rhythmic delivery makes it difficult to micromanage vowel shapes at the desired performance tempo. In this instance, implementing a central vowel by which to sing the line would be the most beneficial and efficient choice. As previously discussed, the utilization of /æ/ would provide multiple benefits for those reasons outlined above.

NAVIGATING RESONANCE STRATEGIES

In order to make appropriately informed technical decisions, one must carefully consider the many factors that have influenced the development of any style. Prior to the birth of rock and roll, African natives used percussion instruments as a means for communicative exchanges.[6] Western tribes primarily utilized percussive approaches, while Eastern tribes also employed the use of string instruments in daily communication, formal ceremonies, and entertainment. Arguably the most important detail was that all instruments, including the voice, were intended to serve as rhythmic makers. This ultimately laid the bedrock for the birth of rock 'n' roll as we know it today.

Different subgenres within the pop/rock canon have a number of unique stylistic implications that may impact the technical approach a singer needs to adopt in order to sound authentic in that style. For instance, r&b calls for a fairly light vocal approach with excessive use of embellishments, melismatic figures, and quick vibrato.[7] Rock music, on the other hand, utilizes an approach that engages a heavier mechanism, vocal grit, and sometimes distortion. Rap and reggae generally utilize an exaggerated speech driven approach, broken phrasing, punchy consonants, and hard stops.

It may come as no surprise as to why many singers struggle to adopt a technical approach that is both efficient and sustainable in light of the significant presence of percussive elements that often interrupt flow and hinder the implementation of a consistent resonance strategy. In order for the vocal mechanism to function efficiently, a deliberate approach to optimization of resonance must be considered. Preserving the integrity of vowel shapes (however bright, dark, or otherwise) while moving each vowel into a similar internal shape will enable the singer to work smarter, not harder. Figure 1 illustrates the "hot zone," which serves as the target for prime optimization of resonance.

COUNTERBALANCE AND CONDITIONING

In the world of sports medicine, great emphasis is placed on programming models that utilize a systematic and progressive approach to physical training. These methods equip athletes with the means to improve flexibility, endurance, muscular stabilization, strength, and power.

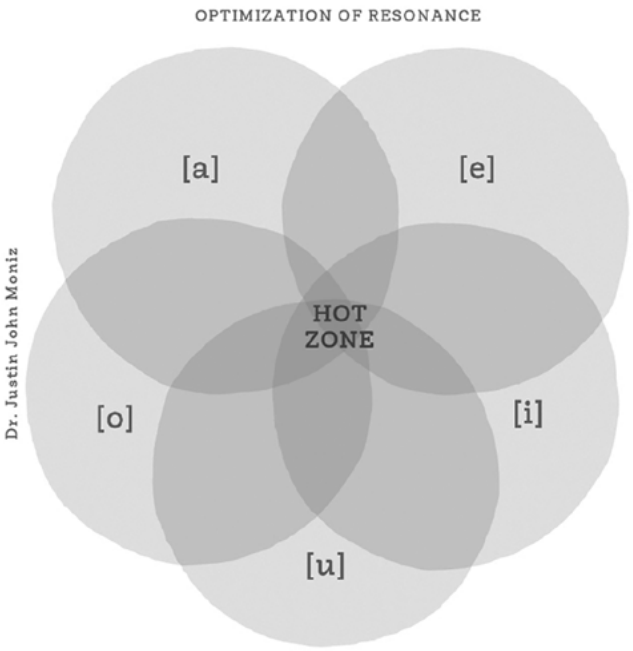


Figure 1. Optimization of resonance.

It is especially important to consider the prioritization of counterbalance. For example, one might incorporate the use of a superset to help achieve efficiency and sustainability through various movement patterns.[8]

For the purposes of voice training and conditioning, vocal supersets might be explored with antagonistic muscles or opposing muscle groups. Working through a superset circuit of head-dominant and chest-dominant vocalises, for instance, would require the mechanism to quickly respond to varied levels of cricothyroid and thyroarytenoid muscular engagement. While extended periods of rest are minimized in the superset model, this circuit would provide one set of muscles some active rest while the opposite muscles engage, thus facilitating ample counterbalance within the vocal mechanism.

Stabilization, strength, and power training can serve as an appropriate and effective framework for long term vocal conditioning. Effective programming and pedagogic instruction will be dependent upon a teacher's ability to carefully alternate exercises and vocalises that work through a varied model. Exploring each of these three areas will establish the foundation on which to build a systematic and progressive approach to long term vocal conditioning and endurance.

Stabilization work is especially important for beginners as it is crafted to prepare the vocal mechanism for the demands of high impact production. For more advanced singers, this work allows for active recovery from more intense periods of extreme vocal usage. This may include highly concentrated use of rock cries, cracks, pops, growls, glottal onsets, aspirated offsets, excessive breathiness, and fry phonation over a concentrated duration of time. Stabilization work involves lower intensity and higher repetitions. It places an emphasis on the improvement of movement patterns, muscular stabilization, endurance, and mobility. Once a student exhibits adequate flexibility, specifically through register navigation, vocalises should begin to challenge proprioception and control.

Strength conditioning is intended to increase muscular endurance and maximal strength.[9] As previously mentioned, the use of superset techniques is a way by which to increase flexibility and build strength. Once ample flexibility is learned, a student can focus on incorporating higher levels of volume into their production. This may include singing in more extreme registers for longer periods with minimal rest. Gradually increasing the vocal load will slowly allow for the development of maximal strength capabilities.

Power training is designed to increase the rate of force production.[10] In order to achieve facility at high levels of power, singers must train with both heavy loads and light loads at high speeds. For example, the implementation and execution of quick riffs and turns in both head and chest registers would increase overall levels of power. This phase of conditioning focuses on both high force and velocity to increase vocal power, efficiency, and sustainability.

An additional consideration of effective vocal conditioning might include undulating periodization. This model utilizes changes in volume, intensity, and exercise selection to provide loading differences on a daily or weekly basis.[11] Undulating periodization provides mental benefits to singers, as well, as the approaches to conditioning become more varied and less predictable.

CONCLUSION

One's ability to regulate vocal load in high impact production is directly related to the potential risk of vocal injury. The more deconditioned a singer is, the greater the risk of injury. It is important to recognize that being deconditioned does not necessarily mean that a singer is unable to sustain adequate airflow or sing comfortably in the upper register. Being deconditioned is a state in which a singer may have a combination of muscle imbalances, poor flexibility, insufficient endurance, or limited stability. All of these conditions can greatly inhibit the ability of the vocal mechanism to produce proper movement and may ultimately result in a vocal pathology.

The pop/rock canon arguably has challenged the ways in which we effectively engage in pedagogic practice within the teaching studio. A heightened awareness and understanding of anatomy, vocal function, and vocal health are essential components of effective teaching.[12] Approaching the vast array of subgenres present within the pop/rock canon must be done with great care. A deliberate emphasis should be placed assessing voices with objective measures. Seeking answers to questions of efficiency and sustainability will begin to guide the pedagogic process for even the novice CCM pedagogue.

NOTES

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5. Ingo Titze, "Why /i/ and /e/ Can Be Effective Belting Vowels," *Journal of Singing* 74, no. 5 (May/June 2018): 543–545.
6. Matt Edwards, *So You Want to Sing Rock 'N' Roll* (Lanham, MD: Rowman & Littlefield, 2014), 1–5.
7. Bartlett and Naismith, 278.
8. A "superset" is two exercises performed back to back in rapid succession with minimal to no rest.
9. Micheal A. Clark et al., *NASM Essentials of Personal Fitness Training*, 7th edition (Burlington, MA: Jones &

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10. Ibid.
11. Ibid.
12. Scott McCoy, "The Old Dog Learns a New Trick (or Why I Now Teach Belting)," *Journal of Singing* 73, no. 1 (September/October 2016): 46.

At NYU, **Dr. Justin John Moniz** leads the graduate voice pedagogy program, where he teaches courses in pedagogic theory, practice, and applied voice. In addition, he directs the NYU Pop/Rock Ensemble, a group he founded in 2019. Dr. Moniz was recently awarded Steinhardt's prestigious Faculty Development & Diversity Innovation Grant for his project, "Paving New Paths: Understanding Trans Identities On-Stage & Off."

Recent graduates of the program have joined the faculties at NYU, Syracuse University, and College of the Ozarks. Under his leadership, the NYU Vocal Pedagogy Outreach Initiative has quickly earned both national and international recognition. His paper, "Assessing the Impact of Vocal Pedagogy Outreach Activities on Geographically, Culturally, and Economically Disadvantaged Communities," will be presented at the 13th Annual Conference on Visual and Performing Arts, hosted by the Athens Institute for Education Research in Athens, Greece in June 2022.

A leading expert on contemporary voice pedagogy, Moniz is regularly engaged as a guest clinician and consultant for organizations including the National Association of Teachers of Singing (NATS), National Opera Association (NOA), The Royal Conservatory, New England Conservatory, Boston University, and Boston Conservatory at Berklee, among others. Dr. Moniz currently serves as a mentor teacher for the NATS National Mentoring Collaborative and the NATS Mentored Teaching Experience. He is also a guest faculty member for the Vocal Pedagogy Professional Workshop at Boston Conservatory at Berklee. Locally, Dr. Moniz is an active member of the NATS-NYC Chapter where he serves as Chair of Student Auditions and as a member of the Board of Directors. For the past four years, he has also served as Co-Chair of the Inclusivity, Diversity, Equity, and Access Committee for NOA.

A three-time winner of the American Prize in Vocal Performance, Moniz has sung over 90 roles to date, having recently appeared with Opera Grand Rapids, Utah Festival Opera & Musical Theatre, Sarasota Opera, Florida Grand Opera, The Columbus Philharmonic, Opera Company of Middlebury, Opera New Jersey, DreamCatcher Theatre/Adrienne Arsht Center, Orchestra Miami, Gulfshore Opera, Palm Beach Dramaworks, the Orchestra of Northern New York, and Chicago Symphony Center. His unique style and versatility have afforded him an active career in opera, concert, and music theater. Moniz is a proud member of the American Guild of Musical Artists and the Actors' Equity Association. He also serves as Executive Director of Hawaii Performing Arts Festival.

Dr. Moniz holds four degrees from Florida State University, the University of Miami, and SUNY Potsdam, and certifications from Harvard Business School, Duke University, and the National Academy of Sports Medicine (NASM). As a voice teacher, researcher, and NASM Certified Personal Trainer, Moniz is particularly passionate about identifying the parallels between the worlds of voice science and sports medicine, more specifically concerning vocal load, efficiency, and sustainability. For more information: www.justinjohnmoniz.com.