

Physical Exercise Techniques and Physical Fitness for Optimal Vocal Performance

Assignment 1: Literature

Critically evaluate a range of concepts, models and related concepts that you have recently studied and that are relevant to your workplace, and devise a strategy to apply what you have learned to improve your practice and performance.

Introduction:

Through this analysis, I will examine literature surrounding exercise science concepts and physical fitness, and their impact on the voice, in order to uncover various forms of exercise to implement in my diverse studio to optimize performance. I am a classically trained vocalist and relatively new voice teacher, versed in various genres and styles, working with singers of all ages and vocal experience. Since childhood, I have been involved in copious physical activities and lately have taken interest in strength and resistance training. The ideals of coordination, strength, coachability and understanding my personal body map, results from my lifelong physical endeavors, have been influential in molding me into a vocal athlete. Principles of exercise science and their relation to the voice have been utilized by speech-language pathologists for quite some time, mainly centered around voice disorders and injury, but only few voice pedagogues and teachers delve into physiologic exercise (LeBorgne & Rosenberg, 2021). Although aspects of exercise science, such as warm-up and skill acquisition, have been adapted to the vocal field, muscle training, specifically, has not been extensively utilized in studio and clinic settings (Sandage & Hoch, 2018). I believe the understanding of one's instrument is vital to success, thus, being cognizant of, and diligent with, the training of the complex muscles of the voice and body will allow for maximum technique and performance. I will explore vocal techniques and exercise science theories of kinesthesia, body mapping, mind muscle connection, specificity principle, and overload principle, and how they intertwine, in order to reveal various forms of exercise to institute in my studio that may benefit vocal athletes for performance in various genres. These characteristics of voice and exercise science can all be categorized as complex motor learning principles that generally "coordinate, strengthen, and build stamina and longevity" (Chandler, 2022 p.337) in order for the body, and voice specifically, to function at the highest ability. Performers, in this case vocal athletes, must synchronize these complementary principles in order to optimally perform and heighten marketability and success (Chandler, 2022).

Analysis of Literature

Ohrenstein describes singing as “a highly precise and interactive set of coordinated muscular adjustments, most of which cannot be seen” (2003, p. 29). Proficiency and control of this movement is composed of vocal training techniques of body mapping and kinesthesia. Body Mapping, derived from Alexander Technique by William and Barbara Conable (Malde, Allen & Zeller, 2020), is the ever changing, cognitive construct of the “body’s structure, size, location and function” based on kinesthesia. Kinesthesia pertains to the body in motion and the perception, caliber, and magnitude of said motion (Malde, Allen & Zeller, 2020). Anatomically speaking, it is vital for all athletes to understand their body in order to perform to the best of their ability, and vocal athletes are no different; however, their progress is not as clear cut.

Weightlifters, after utilizing body mapping exercises to perfect form for various exercises, may see results in the muscle tone of the specific area trained, whereas vocalists progress is mostly visually veiled - as Ohrenstein describes, “tonal beauty is not obvious to the novice in the way that a “swish” into the basketball net is” (2003, p. 30). The challenge for most amateur singers, or singers who struggle with coordination, is to gain the sense of kinesthesia to correct their body map. I postulate that the employment of exercise and its theories will simultaneously equip both voice teachers and singing students with the understanding of the tools and movements that are advantageous toward the battle of individual kinesthetic perception and body map acquisition. Once these skills are understood and attained at the basic level, incorporation of exercise training principles of mind muscle connection, specificity and overload maximize performance of the muscles throughout the body that aid in vocalization. Consequently, the movement becomes as technically efficient as possible while also encouraging growth in endurance, stamina and fatigue resistance.

Malde, Allen and Zeller (2020) explore resources to hone into and enhance a singer’s body map through kinesthesia and inclusive awareness of the environment, including, but not limited to, human body study, mirror work, acknowledgement of senses via inclusive awareness, and intentional movement. All of these aspects relate to the exercise science and weight lifting theory of mind muscle connection. Schoenfeld and Contreras (2016) explain how interior, body cues, and exterior, imaging and sensory information, focuses beneficially affect athletic performance. They delineate that mind muscle connection refers to the kinesthetic, internal focus to visualize, feel, and analyze the specific muscle at work in order to “consciously direct...neural drive to the muscle during...performance. Theoretically...increas[ing] activation”

(2016, p. 27-28). I believe physical activity and exercise within the studio will aid in body mapping, through the process of understanding mind muscle connection, for all students, while also increasing strength, endurance, stamina, and overall health, allowing vocalists fully commit to the various demands of performance. It is hard to postulate how mind muscle connection can be related to the intrinsic muscles of the larynx and smaller fine motor muscles related to vocalization other than through visualization, analysis of sensation or model study. I hope that I can delve deeper into this conundrum, through future research, to unveil the probability of confidently navigating the incorporation of mind muscle connection for the activity of laryngeal muscles specifically.

Triple threat performers, vocal athletes who sing, dance, and act, are no stranger to endurance and stamina; they are expected to perform under “high vocal demand conditions...[and] must incorporate multiple levels of fitness...in order to effectively meet industry...and performance expectations” (LeBorgne & Rosenberg, 2018, p.88). These days, performers, of various genres, are expected to meet demands of blocking, choreography, costuming, and various other external forces, as well as muscular energy, cardiovascular resilience, and vocal technique demands, all whilst emoting and performing in order to maintain marketability (LeBorgne & Rosenberg, 2021) (Chandler, 2022). For the purpose of efficiently training endurance, strength and stamina, training principles of specificity and progressive overload play a huge role. Specificity principle, explained by various training professionals and vocal pedagogues (Schneider, Dennehy, & Saxon, 1997) (Hoch & Sandage, 2007), applies to the exercises that are specific and similar to those of the desired task, in this case vocal performance; and for the sake of my argument, triple threat vocal athletes. The overload principle, explained at depth by Schneider *et al* (1997) states that in order for strength to rise, a larger demand, or stress, must be imposed on the muscle at work. This stress, otherwise known as overload, surpasses the limits and strength is gained and the specifically targeted muscle fibers increase on a biochemical level depending on the muscle fiber type at hand. Johnson and Sandage (2021) discuss the muscle fiber types located in the larynx and their relation to the muscles in the rest of the body, and how physical exercise tactics of the body can be utilized to ameliorate vocal function. Both Type I and Type II muscle fibers can be found in the larynx, but typically an individual has more Type II, in order to protect of the airway and fulfill glottal closure tasks. Type II, while seen more, experiences more fatigue than Type I, thus portraying that Type I muscle fibers can known as “endurance fibers” (Johnson & Sandage, 2021, p.668). Despite a lack of study on the integration of physical exercise, the implication of exercise science ideals is

common for training the voice. In order to upregulate these difficult to isolate muscle tissues, a performer must “impose enough of a demand on the physiology...[to] target performance level without overdoing it...[to] match the vocal requirements of the goal behavior” (Johnson & Sandage, 2021, p.670). Thus, playing exercise science principles, of mind muscle connection, specificity and overload, to condition fatigue and ultimately creating an efficient, coordinated vocal mechanism. Sandage and Pascoe (2010) explain that the inaccessibility factor of the intrinsic laryngeal muscles supports the lack of studies pertaining to physical exercise and vocal training. However, physical exercise science concepts are useful to begin introducing an exercise-based framework into the voice studio.

Progressive overload can also utilize resistance and endurance as stress factors to increase stamina. Sandage and Hoch (2018), and more recently Johnson and Sandage (2021), introduce the specific adaptations to imposed demand (SAID) principle which incorporates the both specificity and overload. After various studies highlighting traditional vocal warm-up, and the shortcomings, were conducted by Amir, Amir & Michaeli (2005) and Moorcroft & Kenny (2013), McHenry and Evan's (2016) hypothesized that inclusion of aerobic exercise in a classical singer's warm-up routine would positively affect sound and subglottal pressure, along with initial inhale, breath support and vocal fold efficiency. Cleveland Clinic (2019) defines aerobic exercises as exertion that allows the consumption of oxygen and can typically be completed while maintaining conversation. Almost every category from the study, discounting only the initial inhalation, reported positive findings. Since experiments and data involving inclusion of physical exercise in the voice are few and far between (Johnson & Sandage, 2021), research must be conducted to understand how various forms of exercise, including aerobic and anaerobic exertion, affect vocal function. It is fairly common for voice teachers to take advantage of these exercise science principles to record value of skill acquisition (Sandage & Hoch, 2018), however, inclusion of physical exercise is often omitted due to the lack of research (Sandage & Pascoe, 2010). More studies similar to McHenry and Evan's (2016) must be conducted on various forms of exercise, with a focal point of vocal health and longevity, in order to note their affect, and desirable benefits, on performance factors. With the recent evolution of the voice performance industry, noted by various pedagogues (LeBorgne & Rosenberg, 2021) (Chandler, 2022), and resulting demands put onto performers, I believe, from a performer and teacher viewpoint, the addition of research-based exercise programs and regiments with the focus of the vocalist, and their instrument, at the forefront is necessary to wellbeing and success. Furthermore, voice

teachers and pathologists must understand how vital natural and intentional movement, driven by exercise science principles, can be to a well rounded vocal athlete.

Translation to Practice and Potential Impact

With a majority of my studio comprised of newer, younger singers ranging from fourteen to forty, it is imperative to introduce body mapping and kinesthesia practices to instill healthy, proper vocal technique and postural alignment. I believe that these processes can be compounded by the use of physical movement and strength training exercises, as well as Malde, Allen & Zeller's (2020) tools discussed earlier, to create an all encompassing kinesthetic perception of a performers body map. Indicated in a loose poll of exercise habits that I conducted with these students, the majority try to stay active through various forms and rigours of exercise and they are keen to incorporate discussion and implementation of physical activity in their lessons. Various vocal exercises and systematic tools explained by Ragan (2020) and Rosenberg and LeBorgne (2021) will deem useful to establish a dialogue and foundation to begin introducing exercise principles and physical exercise to the studio. Eventually, these exercises will help students prepare for and recover from exercise. Ragan (2020) suggests employing equipment such as various yoga balls and exercise bands, in conjunction with typical vocal tools, including straws, flowballs and other semi occluded vocal tract exercises, in order to increase awareness and engagement in the body. Implementation of exercises with the equipment (Ragan, 2020) will deem useful for a physical warm up before execution of exercise. Rosenberg and LeBorgne (2021) expound on stretches, including mobility and flexibility work, and relaxation that will complement programed movement well and I believe would suit perfectly as a post exercise cool down. Chandler (2022, p.340, 342) explains that in order for exercise, of any means, to be beneficial for the voice, it must ensure that mobility and flexibility of the body, importantly the vocal mechanism, are not compromised. His phrase, "strengthen then lengthen" advises the use of a cool down regimen of "low impact movement" (2022, p.342) to allow the body and its mobility to return to homeostasis. The stretches provided in Rosenberg and LeBorgne (2021) seem to align with this objective in order to best recover from thoughtfully programed exercise in the voice studio.

Various pedagogues agree that appropriate strength exercises and training, adhering to exercise science principles (Sandage & Hoch, 2018), may beneficially advance vocal performance by means of refined postural alignment (Schneider, Dennehy, & Saxon, 1997), increased stamina and endurance (Chandler, 2022), fatigue resistance (Hoch & Sandage,

2017), coordination (Ohrenstein, 2003), and marketability of the performer (Chandler, 2022). Chandler (2022) explains that previous myths and stigmas surrounding strength training, and the tension it may instill, in conjunction with singing can be dispelled by noting that mindfully furthering our physical wellness directly correlates to improvement of singing and performance in general. However, the main factor here is doing so, healthily, with voice technique in mind in order to align with performance and career goals. Chandler (2022) also discusses alternative techniques to typical strength training, cardiovascular exercise, and endurance and stamina training in order to best fit the lifestyle and goals of a performing vocal athlete, both through movement and vocal production. His advice includes alleviating Vagal manneuver tendencies via voiced consonants exhalations during strength training, maintaining postural alignment by understanding and prioritizing use of antagonistic muscle groups through pulling and pushing exercises, relieving tension by means of flexibility and mobility of both the body and voice, and mitigating fatigue by increasing the stamina and endurance of the cardiovascular system (Chandler, 2022).

In hopes of further dismantling previous thoughts of activity leading to tension in vocalization, a study by Petterson and Westgaard (2004) reports on the impact of heightened activity in respiratory muscles in relation to subglottal pressure and phonation. No correlation was found between muscular effort of trapezius and sternocleidomastoid muscles affecting the intercostal, rectus abdominis, and lateral abdominal muscles and the vocal line. From an exercise perspective, this leads me to believe that training diligently and consciously, with goals of vocal performance in mind, will not directly create excess tension to affect breathing and singing overall. It is also intriguing to use these findings in later research to know exactly how training muscles outside of those used for respiration, phonation and articulation can be implemented to increase voice production, performance and overall wellness of vocal athletes.

In athletics there are various occupations to support and guide an athlete's career and physical fitness, such as coaches, physical therapists, personal trainers and so on. However, as a vocal athlete, the performer "must be responsible for protecting their instrument during...physical exercise," rather than a "personal trainer [who] does not have the expertise in the singing voice" (Chandler, 2022, p.341). From personal experience, the pressure to understand ones instrument and healthily protect it, whilst engaging in physical exercise is fierce and daunting. Completing this research has made me realize the void in the voice field to support vocal athletes through voice and performance focused exercise. In an effort to offer my students an

understanding of their bodies in relation to their instrument, while simultaneously preparing for the various demands of the performance business, I hope to fill this gap. Once certified to do so, I plan to take advantage of all these guidelines when I employ exercise in my studio in order to foster healthy movement practices centred on vocal longevity and optimization.

Literature Strengths and Weaknesses

The literature surrounding exercise science principles in relation to voice care is very well researched, proven by the numerous dates and scopes of the articles I acquired. However, they mainly do not include specific training exercises (Sandage & Hoch, 2018) or the benefits of physical exercise in their pursuits. A strength I noticed spanning many of the articles I researched was how effortlessly the ideas of exercise science built off another, making it more straightforward for me to apply the principles to the inclusion of exercise in voice training. The lack of literature and data pertaining to physical movement in the voice studio, although frustrating, leaves me with unanswered questions that inspire and allow for prospective growth potential for future modules and research projects. Voice pathologists have been using vocal exercises structured around exercise science fundamentals for quite some time (LeBorgne & Rosenberg, 2018), but from a voice performance and vocal athlete standpoint, the inclusion of physical movement is relatively new to the field, and may stem from the competitive nature of the business these days (Chandler, 2022). I found it difficult to navigate the newer research because it was simply inaccessible due to nonexistent library presence, and expensive costs, or paywall barriers, for newer publications. I believe that the addition of physical exercise into the voice studio is a topic area that more pedagogues and teachers should be versed in, which is difficult with the absence of data and inaccessibility to the recent publications. In closing, the coexistence of movement and vocalization should be studied in more detail to where they can be utilized to optimize performance and health of vocal athletes.

Assignment 2: Reflection and Personal Development Plan

Critically reflect on your recent learning experience, review current skills and devise a personal development plan to address identified areas for further development.

Reflection

Various aspects of this research were challenging for me. I was frustrated that literature was mainly focused around general exercise science principles rather than forms of physical

exercise, or distinct exercises, to best benefit specific performers. This overshadowed the topic I mainly wanted to explore, which was discouraging. Since the integration of exercise into vocal performance training is more recent, multiple journal articles explicitly addressing exercise regimens for performers are behind the barriers of paywalls, overall enumerating my vexation. Ghaye delineates the effect of negative feelings leading into a cycle of “deficit-based action” (2011, p.9-10) which directly transforms to procrastination. As consequence, I struggled and was stuck in a “deficit-based action” cycle noted by extensive negativity and procrastination throughout my research process. Since I began my studio, I made a point to always ask students three positive aspects from performing their repertoire work, which can range from general to specific. Slade and Owens (1998, p.378) term “positive perfectionism” and its benefits, which is fueled by affirmative feedback and is characterized by a yearning to succeed at high levels. From my personal and teaching experience, vocalists tend to be their own biggest critic, so insisting on the positive and constructive critic, is a necessary tool for a singer to frame their performance with a “positive perfectionism” (Slade and Owens, 1998) focused mindset to increase emotional connection to the art, involvement and overall success. Ghaye (2011 p.13), with the guidance of Aristotle, explains that positive engagement, emotion, and relationship promotes meaning and amplifies growth. Through future modules and academic endeavors, I must follow my own advice and reposition my focus from my weaknesses to my strengths, via positive reinforcement, in order to fulfill Ghaye’s (2011) ideals of appreciative reflection, intent and action in addition to Slade and Owens (1998) objectives of “positive perfectionism” to continue refining my teaching and performance skills.

Future Learning - “So What?”

With the aim to begin focusing on my positive strengths, I would be remiss to exclude the importance and accountability of prospective, future growth. Using Ghaye’s (2011, p.33) strengths-based reflective strategy table, I will reveal areas of inspiration for further research and action, that I plan to investigate through upcoming modules in the Master’s program and also experiment and implement in my studio.

Ghaye (2011, p.33) strength-based reflective strategy:

Step one: Identify and Clarify	I believe one of my greatest strengths is my ability to articulate the sensations of natural, coordinated movement to my students. This stems from my body map work, exercise background and understanding my instrument as a whole.
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Step two: Affirming and Understanding	Many professionals and audience members have commented on my authentic movement and endurance throughout performances. This inspires me to instill this importance of movement in my students so they have the opportunity to become completely connected and fluid within their performance. I hope to apply exercise science principles and forms of exercise to accomplish this.
Step three: Execute and Integrate	Some of my students are newer or unfamiliar with exercise and the principles involved, so I have to acquire other exercise and cues, outside of my knowledge, in order to aid their movement and coordination. This will entail stepping out of my personal exercise comfort zone in order to meet my students at their levels to best equip them with physical exercises suitable to their performance requirements.
Step four: Amplification and Impact	I aim to prioritize physical health in my studio through open discussion and willing participation of exercises using the principles delineated above. Not only may this benefit general physical wellness, it will allow for increased marketability, stamina, endurance, and discipline of the student (Chandler, 2022, p.345) which may lead to overall success and happiness. The understanding of the instrument and the body is an objective of voice training that I believe is unparalleled and extremely necessary for success. Formulation and execution of that knowledge is power that I strive to instill in my students for them to be the best performer they can be. It also inspires and motivates me to keep active, both physically and mentally, in order to gain knowledge on various exercises practices to optimize vocal performance. Overall, this inspires me to continue researching how I can best fill gaps in the ever evolving voice field while playing to my strengths.

Reflective Practice Theories and Models

While familiarizing myself with reflective practice theories and models, I realized that Schön's initial idea of reflection-on-action (1983) is not natural to me, thus making this assignment

section all the more daunting. I am more of a think on my feet teacher and I find that my students respond better to reflection-in-action. However, I realize that change, at times, is uncomfortable and I must lean into new reflective practices, out of my comfort zone, for sake of professional and personal growth. Ghaye's development of reflective practice (2011) addresses Solomon's (1987) concerns (Warwick, 2007, p.7) about Schön's lack of social interaction within his reflective practice theory. Ghaye expounds past reflection-in and reflection-on-action, to reflection-for and reflection-with-action that incorporate both individual and group engagement. As stated earlier, I am versed in the improvisational dance of thinking on my feet through reflection-in-action work, but I am lacking in the other areas of on, for, and with, and also generally missing the group aspect of growth through reflection. What I found most rewarding during my research process was the chance to engage and chew over module topics with tutors and members of copious cohorts during the open discussion forum. As a voice teacher in my own studio it is easy to become isolated from other voice professionals, and I now realize the "limits to learning and acting alone. Often the power to change and improve something is better achieved by a group" (Ghaye, 2011, p.7). I ascertain that I must begin switching the script of my reflections to use resources, such as outreach to other experts, in parallel with analysis of my past in order to extrapolate positive future, professional and academic endeavors.

Personal Development Plan

Based on Ghaye *et al.* (2008) strength-based reflective framework (Ghaye, 2011 p.18)

Appreciate:	Goal: Allow myself to reflect upon the growth I have made since becoming a voice teacher in relation to my intention and teaching identity. I want to be able to express my progress to others. Reflect on how my involvement in exercise has made me a well rounded performer and teacher. Consider how I am able to bequeath natural movement and confident coordination to my
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	students. Action: Begin journaling about the process, with emphasis on learning and unlearning that is taking place. Also, on occasion, share thoughts, feelings, successes and frustrations with other voice professions - perhaps fellow cohort members to establish a social and relational aspect. Begin documenting my exercise journey in relation to my voice practice to notice how my vocal technique fares with various forms of exercise. Timeline/deadline: Start through this reflection and continue this process for the future in order to generate a positive and progressive mindset. Invite other professionals for a check-in chat every quarter. Immediately begin recording my workout regimen in association with a vocal practice journal. This will also include exercise metrics such as overload and specificity for both exercise and voice factors. Review and analyze the results monthly. Goal: Notice my progress through the MA course and appreciate the value of the journey, rather than being bogged down by the workload. Action: Create specific affirmations and intentions to turn over a new, positive leaf for future modules by focusing on my strengths rather than my negative weaknesses. Deadline: Prepare and internalize a positive mindset before embarking on module 2, whilst still maintaining a sense of reality and balance.
Imagine:	Goal: Understand that a major part of growth and progression as a teacher is unlearning and reformulating ideas through continued education. Action: Participate in the Musical Athlete exercise programs, membership and

	community. Inquire about consultation. Deadline: Complete free trial consultation before summer holiday.
Design:	Goal: Set out to equip all students with confidence in, as well as, understanding and coordination of their instruments in hopes of optimal performance and overall health. Action: Gain consent from students and/or parents. Integrate exercise and exercise science principles into my studio. Begin acquiring necessary equipment and tools to slowly incorporate exercise into warm-ups, skill acquisition and at home practice regimens for my students. Deadline: Commence with body weight exercises similar to Musical Athlete programming, and equipment I already have, as soon as possible once consent is received.
Act:	Goal: Become a Certified Personal Trainer (CPT) with an emphasis on vocal athletes in order to gain credibility and confidence in order to fill the void of CPT in the vocal field. Action: Research courses and reach out to Steph and Chris at the Musical Athlete for advice and mentorship opportunities. Deadline: Inquire at consultation lesson, and in the meantime begin investigating CPT options to invest in and begin on summer holiday.

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