Review

Assembling a Vocal “Eiffel Tower” to Improve the Quality of the Singing Voice

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Assembling a Vocal "Eiffel Tower" to Improve the Quality of the Singing Voice

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Abstract: The human voice consists of two major registers: the lower voice, which is regarded as "the chest voice", and the upper voice, which is regarded as "the head voice". The lower voice is mainly utilised for normal speech, whilst the activity of singing is more based upon the upper voice. There is an upper section of the "head voice" that is known as "falsetto" and a bridge toward the "whistle" vocal register. There are three general categories of the human singing voice. In males, the three categories are generally known as Bass, Baritone and Tenor, whilst in female voice, the three categories of singing voice are generally known as: Alto, Mezzo-Soprano and Soprano. The determination of the human vocal range is usually done via an assessment of the utilised vocal registries within specific ranges of musical notes from a piano (i.e. **C0 - C7, 8 octaves => 64 whole notes**, with **38 intermediary notes**), and based on the equilibrium of lower-upper vocal registry utilisation in the process. For example, if a lower musical note is hit with the upper vocal registry, then the user is deemed to have a lower vocal range. On the other hand, if a higher musical note is hit with the lower vocal register, then the user is deemed to have a higher vocal range. Furthermore, vocal range is known to be fluid, in accordance to the level of vocal training, as users reported that their vocal ranges widened significantly following extensive, long-term training. The human voice is overall regarded as a musical instrument that has been utilised since the beginning of human history and, as with any musical instrument, the present study emphasises upon the importance of a proportional training of the human voice to ensure that the utmost potential in singing abilities is reached through a thorough, long-term and careful extent of vocal training, exercises, as well as considerable durations of vocal rest in between. The present study compares the long-term development of the human singing voice with the patterns behind the assembly of the Eiffel Tower, which occurred in three stages to create a structure composed of two exponentially-growing curves intersecting with each other at the top, given that it is in a similar manner that the singing voice is developed, with the human voice becoming exponentially more capable of hitting high notes as a result of the training of the head voice (i.e. second section of the Eiffel Tower) and even of the "whistle" register (i.e. third, top section of the Eiffel Tower), with the three human passagios resembling the three levels separating the three sections of the Tower. Such an analogy would support teenage users in resolving puberty-generated vocal gaps and proportionally reflect the theory in which the range of the upper voice expands by 3 quarters of a tone during each training phase displaying a threshold level of both quality and duration, resulting in the R squared value equating to 0.92 (p value < 0.01). With each round of accurate vocal training, a phenomenon occurs in which "a vocal mix" occurs and its quality continuously increases. Such a "mixing" process implicates the reversion of the vocal foundations, in which the random human voice has its foundation changed, from a lower, speaking register, to a higher, singing register. Some vocalists and researchers may describe such contexts in a few words "pulling the voice reversely", by basing the human voice upon the "head" voice, rather than the "chest" voice, to avoid phenomena of "vocal straining" and "breaks". Principles of human psychology, as well as emotional and physical wellbeing can apply to effective methods of singing vocal development, meaning that motivation plays a significant role in ensuring a long-term state of vocal progress. The overall manuscript suggests that the successful assembly of the singing human voice reflects the assembly of the Eiffel Tower's structure, hypothesising that the extension of the human vocal range reflects a two-phase exponential growth model.

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Introduction

The human voice consists of the speaking and the singing vocal registers. The human voice is often partially developed as a result of the undertraining of the singing voice, and such vocal states are like the Eiffel Tower being in the first stage of its assembly, which only involves the successful construction of its base, toward the first level. The Eiffel Tower had a shape of a trapezium during such a stage, and a fully developed singing voice would resemble the fully-developed Eiffel Tower, which consists of two exponentially-growing curves intersecting with each other “naturally” at the top, following a significant growth on a vertical plane. The difference between the two states of construction is marked by a significant time of consistent and proportional practice of the singing voice, which is coupled with a threshold level of psychological, intellectual and emotional discernment. It is true that vocal training begins from the speaking level, given that it constitutes the foundation of the human voice. Likewise, it may only be rational for vocal experts to recommend practicing vocalists to train their voice from the speech level, rather than focusing their training upon singing itself. Just as the purpose of assembling the Eiffel Tower to the top-end was not the continuation of the base in a horizontal plane, but the change of the assembling direction into a vertical plane, so a vocalist would arch the width of their overall voice when hitting higher musical notes, firmly reaching the state of the upper voice before the overall voice would naturally “mix” with the lower register. No force or tension is reached when one sings high notes naturally. One may conceptualise such a phenomenon by imagining that there is no “reach” of high notes, but that the high notes are already present within the human vocal range. Likewise, the “brainstorming” process behind vocal development would involve not a thought of “ascension”, but rather a thought of “descent”, reflecting important teachings in Eastern Orthodox Christian Philosophy, in which it is said that God is not found up, in the heavens, but down, in the human heart. Likewise, a person would require to “descend” from the mind to the heart during prayer and reflection of the Divinity. Perhaps, in the same manner, vocalists require to “descend” from the realm of logical thinking, to the realm of “powerful emotional training”, to successfully reach their vocal potential and resolve the initial gaps of vocal breaks between the upper and the lower vocal registers resulting from puberty. Such a pattern may reflect the “rationale” behind efforts of recovery from addiction, as logical thinking is deemed as the rip current in a sea, and the generation of a stronger, healthier emotion as the healthy response of “swimming in parallel with the shore” to evade the rip current without opposing it. Such an analogy is often utilised in practices of psychological therapy against various conditions that include substance addiction, obsessive-compulsive disorder, generalised anxiety disorder, attention-deficit hyperactive disorder and depressive disorders, which indicates that good psychological integrity plays a rather crucial role in ensuring a steep, continuous level of vocal development in singers. Furthermore, principles of physics and metaphysics that include Albert Einstein’s research on Relativity and Nikola Tesla’s research on quantum physics also play important foundational roles in good vocal development, which overall indicates that it is psychological levels of philosophy and deep physical layers of material science that constitute the foundation of a complete process of vocal maturation and refinement. Successful vocal formation reflects the process of birth-giving, as the head of the baby appears first, before the rest of their body. In the same manner, successful vocal development involves the training of the “head” voice first. In other words, it is important to “push” the high-note singing through speech-level via the upper, “head” voice, and not via the lower, “chest” voice, to avoid a common phenomenon of vocal straining and induction of “breaks”, which has been affected several intermediate-level vocalists as well. In psychology, there may be a statistical phenomenon of slight prevalence for singers who chose such a profession due to

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specific unmet fundamental needs during important stages of neuronal growth, compared to cohorts of people who did not experience considerable lacks in their needs during their youth, and this aspect may indicate a viable applicability of the Third Law of Newton's Law of Thermodynamics into psychology and human physiology, as it may be that the human mind, emotion and organism would amplify their longing for needs that have been either partly or not met at all. The second step toward successful vocal development would implicate training and practising in front of an audience to undergo psychological "desensitisation" during the time when emotions of "excitement" first occur, as it may be easy for beginning vocalists to subconsciously transform such an emotion into "anxiety", which may impact the extent of gained "muscle memory" during individual practice, which may explain the significant number of cases in which vocalists undergo phases of "vocal straining" and "induced vocal breaks" following live performances, even though they seemed to have practiced well and sometimes even at an expert level during individual warm-ups. Likewise, it may be important for vocalists to undergo a psychological form of training that involves "disengagement", which could make them less prone to "automatically" shift the emotion of positive excitement to anxiety and fear. In other words, psychological therapies and an active address of any past psychological traumas may be necessary for beginning singers to successfully undergo vocal development and start a professional career in public vocal performance.

Methodology

A successful creation of the "Eiffel Tower" of the human, singing voice is ultimately dependent upon the level of human emotional intelligence, rather than logical thinking and physical intellect. In other words, vocalists ought to actively practice a form of "descent" from the rational mind into the emotional heart in order to succeed at public performance, just as in psychotherapies, recovery is not mainly based on logical thinking, but on the successful ignition of emotions that become stronger than the emotions ignited following exposure to specific environmental or chemical factors that are actually harmful for human health and integrity. The present study proposes that three cohorts of candidates are created during a double-blinded clinical trial for the purpose of analysing the depth of positive influence that logical thinking and emotional stimulation play in the pathway of singing vocal development. For the present study, each cohort will consist of approximately 75-100 people, and one of the cohorts will constitute the control group, which will experience no form of training whatsoever. Various statistical forms of testing that include the creation of the Chi-Squared test, unpaired and paired T-tests and ANOVA, will be assembled to specifically compare the efficacy of the two main stimuli for vocal development: logical stimulation alone, or logical and psycho-emotional stimulation combined. The results will indicate the exact resolution of any efficacy or lack of efficacy produced by such stimuli and will aim to further improve the clinical understanding of various environmental and psychological factors in efforts to improve the human singing voice.

Discussion

A common form of myth that has been propagated throughout human society is the idea that only a few, select people are predestined to be able to vocally perform well. The first step in debunking such a myth is to remember William Shakespeare's wise words about the fallacy and harm that the human concept of "predestination" has caused throughout the world, given that His Excellency stated that basing the foundational human beliefs upon the movement of stars in the sky represents an utmost form of foolishness. Such words remind the audience of passages in the Bible that explicitly prohibits believers from believing in predestination, which actually represents a form of divination (idolatry of the created). Likewise, contrary to the common belief that vocal talent is preordained, scientific evidence shows that the majority of people, and in particular children, have latent vocal abilities that may be unlocked through organised vocal exercise and practice. William Shakespeare's quote criticising the belief in predestination exposes the dangers in which self-limiting beliefs can stop healthy skill development and sharpening, causing people to "miss their mark". The

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second step in debunking the myth is to bring a reminder that a far higher proportion of children are naturally able to sing in a highly qualitative manner than adults, and one factor that leads to such a phenomenon represents a psychological "stumbling block", created by a wrong perception created as a natural response to a puberty-induced vocal change. Namely, people tend to subconsciously dismiss the idea of having a vocal "potential" default when they undergo vocal breaks during puberty, and if people have undergone various forms of social and psychological traumas in the past, then such an effect is particularly sharp and long-term in nature. The reality is that puberty-related vocal changes do introduce unpredictable shifts in the vocal registers, with males experiencing vocal drops up to an octave, whilst females experience less substantial drops, with a few semitones. Building "the third level of the vocal Eiffel Tower" may normalise experiences as such and direct vocal exercise toward blended registration, and not pulled chest voice to singing notes that may naturally be covered with the head voice. Likewise, it may be that the actual form of "remedy" against an inability to sing well lies not in physical vocal training, but actually in psychological and emotional forms of therapy, which ultimately involve the foundational layers of physics and metaphysics. In Christian Philosophy, there is a mystery in which wise words circulate amongst pious believers, that in Heaven, all people will sing in miraculous and unimaginable ways, and like children. Likewise, it may be that singing represents a Universally available gift that may only be opened with the opening of the human heart. The hypothesis of the present study rather aligns with multidisciplinary discoveries: physiological, psychological and metaphysical. The physiological sector of the study covers laryngeal biomechanics, whilst the psychological sector covers cognitive and emotional states, addressing a common phenomenon of an anxiety-related "eclipse" of the utmost vocal abilities, and the metaphysical sector covers the activity of descent from the rational mind to the emotional heart. Overall, such a multidisciplinary perspective suggests that real vocal mastery is acquired when technical rigor is blended with emotional engagement in a harmonious manner.

There may be a metaphor in which a regular seaside tourist once swims near the shore, only to suddenly find themselves unable to swim back toward the very shore they comfortably left. The tourist becomes caught in a rip current and their instinct is to swim directly toward the beach. Such a response may only exhaust the person. The solution constitutes a paradox, as it implicates the activity of swimming parallel to the coast or further until an escape of the current actually occurs. The present metaphor reflects a common problem in vocal practice, particularly affecting vocalists making substantial effort to "reach" higher notes. Many such vocalists attempt to push their voice upward, as they assume physical force and effort will help them undergo vocal breakthrough and long-term progress. Many vocalists turn such an attempt into a subconsciousness-derived activity. Nonetheless, just like the swimmer caught in the rip current, such an approach often results in vocal strain, stagnation in vocal progress, or even the abandonment of the "vocal dream" altogether. The nervous system becomes "programmed" over time, with the pathways tied to the lower voice engagement being implicated in particular. To "naturally" switch from the low to the upper registers, vocalists ought to undergo a form of neuronal reprogramming. When physical tension is present, particularly in the body or the jaw, the tendency to pull the chest voice upward increases markedly, resulting in strain, breaks, or an abrupt flip into the vocal register of "falsetto". Such a realisation joins the phenomenon with broader principles in human psychology. Just as the evasion of anxiety and intrusive thoughts involves a principle of "swimming parallel to the shore" - redirecting rather than resisting - so vocalists ought to develop counterintuitive stratagems to freely and gradually transition between the vocal registers. Optimal levels of body-mind connection plays a crucial role, and effective vocal development may only occur based on a joint physiological-psychological spectrum of conditioning. A potential starting point is the reduction of one's over-reliance upon the chest voice, even when lower musical notes are hit. By initiating from a lighter, more blended register, vocalists may discover a smoother, more natural and gradual ascent through their vocal range. It may be that, on average, the chest voice is not biomechanically capable of hitting musical notes higher than B2 or C3 without support from the upper voice, especially in the case of numerous male singers.

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It is important for singers to switch from a low, speech-level vocal placement to a high, singing-level placement, whilst paradoxically maintaining the focus upon speech-level singing. Such a guideline may reflect the mystery of the principle of paradox, in which aspects that seem impossible are ultimately shown to be possible and to co-exist with seemingly opposite forces. A high vocal placement implicates the resonance of sound mainly in the upper vocal tract that includes the pharynx and the nasal cavities, which is characteristic of the head voice. The cricothyroid muscles represent the foundational "instruments" of the head voice, which are used to lengthen and thin the vocal folds, producing higher pitches with less subglottic pressure, in contrast with the chest voice. An over-reliance upon the chest voice, which is driven by the thyroarytenoid muscles, to hit high notes can lead to the straining of the vocal folds and potentially to subsequent injury, especially if such an erroneous activity is repeatedly performed. On the contrary, the prioritisation of the strengthening of the head voice facilitates singing vocal development, by helping vocalists transition smoothly into a "mixed" voice, where both categories of the vocal muscles cooperate harmoniously to synthesise a unified tone throughout the vocal range. Likewise, a well-developed head voice broadens the access to a mixed voice, which combines the chest and the head voice in proportional manners. Such an acquired register allows vocalists to explore their vocal range in an easier manner, helping them deliver their lyrics with emotional depth and effective calibration of their vocal dynamics. It is thereby an acquired mixed voice, which is achieved through the active learning of migrating to a high vocal placement, that supports the singer in conveying profound emotion during vocal performance. Such an expressive quality is especially important in musical genres that require dynamic range, including pop and musical theatre. The accurate use of vocal warm ups may also be an important step, with examples of practices including the integration of lip trills and humming to effectively elevate the vocal placement prior to performance. The choice of a matching pathway of vocal coaching may represent a crucial step in ensuring that the mixed vocal technique is effectively refined and proper vocal health is maintained and even further developed throughout the processes of vocal training and performance. Scientific evidence indicates that speech-level singing remains a viable approach in facilitating the development of a mixed voice, allowing vocalists to blend chest and head vocal registers smoothly (Riggs, 2000).

Conclusion

The human voice constitutes an instrument with numerous small-scale strings whose qualitative and artistic utilisation depends on the right mental and emotional frames of perspectives, given that "muscle memory" is a real concept that is perfectly applicable from psychology to biomechanics of the laryngeal cavity. The fact that the nervous system intersects with the musculoskeletal system via neuromuscular junctions may represent a practical example of psychological applications into vocal utilisation and development. The analogy of the Eiffel Tower's construction during the end of the 19th century may be viable for the purpose of the acquisition of technical knowledge, given the double-exponential growth of the curves that resemble the pyramid of the vocal hierarchies. Perhaps, qualitative vocal exercise describes the acquisition of the ability of the fully constructed Eiffel Tower to "attract" the lightning from the heavens during summer-specific rainy weather may reflect the ability of the human being to descend into the human heart via the "lightnings" of the nervous impulses, which resonate with the electrical signals within the heart. Interestingly, the Eiffel Tower was assembled in a capital filled with the colours of visual and melodic arts, which may not be a sole coincidence afterward, as cultures tend to be expressed at the subconscious level, meaning that specific cultural traits are infiltrated into daily activities with or without the awareness of the participant in such activities. Furthermore, it seems that the human longing for the experience of threshold levels of affection plays a considerable motivational role in one's vocal journey and visible progress, thereby highlighting the high importance of placing emotional engagement at a rather foundational level of vocal development and practice - alongside consistency, humility and seriousness. Vocal coaching may represent a challenging pathway for a significant number of vocalists due to the existence of guidelines that mismatch unique vocal ranges, which in some cases

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may even result in a regression. Likewise, it may be important for aspiring singers to practice substantial levels of discernment in their process of vocal development and even perform in-depth scientific research with regards to the anatomy and physiology of the vocal cords and the central nervous system, as well as any applications of human psychology, physics and even metaphysics into vocal music theory.

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