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Periodization Strategies in Professional Vocal Performance

Ilter Denizoglu and Elif Sahin Orhon

Abstract

Singers are vocal athletes, but they don't always behave like athletes. Periodization is being used in sports medicine and implies the systematic planning of training and exercise for different conditions and phases. With the same thought, a periodization program can be designed for the singer performing on stage. Vocal periodization is a physiologically-based training/exercise strategy for the vocal professionals for the best possible performance and career.

Introduction

An important aspect of singing is that it is a sporting activity. It would not be wrong to consider professional vocal performers who have instruments of their own bodies as vocal athletes. It will be possible for a vocal performer, like a professional athlete, to stay on stage for years with a high-quality, sustainable artistic performance, by equipping both his education and professional life with a sporting perspective. This is why there is truth in the saying 'voice is muscle.'

Vocology has been first defined as "science and practice of voice habilitation" (Titze, 1996). Over time, this term has evolved into an umbrella term that combines different disciplines and perspectives related to the human voice. In this context, (Denizoglu, 2012) vocology can be divided into three main branches: basic vocology (laboratory studies such as acoustics, aerodynamics, biomechanics, neurophysiology, imaging, etc.), pedagogical vocology (habilitative and rehabilitative studies for professional voice), and clinical vocology (diagnosis and treatment of voice problems).

Vocal performers are the main target audience of pedagogical vocology. The professional vocal performer's voice is his/her main source of income, and vocal health problems might temporarily or permanently end the professional career. After Kaufman and Isaacson (Kaufman et al. 1991), a modification for professional voice classification has been proposed by Denizoglu (Denizoglu, 2013), considering the use of performing voice for artistic concerns:

- LEVEL 1 (Vocal performers):
    - Level 1a (Elite vocal performers):
        - Based on high-level artistic performance by voice.
        - Lose their job or career with a slight voice disorder.
        - Soloist opera singers, most well-known singers, some theatre artists.
    - Level 1b (Professional vocal performers):

– Artistic vocal performance on stage (voice quality important).
– Mild to moderate voice disorder affects career and job negatively.
– Most professional choirs, singers, theatre artists.

· Level 1c (Semi Professional vocal performers):
– Mild-moderate vocal disorder does not affect income, but activity limitations occur that affect quality of life.
– Some singers, students of singing and theatre, amateur choir singers.

• LEVEL 2 (Occupational voice users):

· Level 2a (Professional Occupational Voice Users):
– Depends on voice use without artistic concerns.
– Daily job performance is sufficiently impaired because of voice disorde

A professional vocal performer has special needs such as continuous improving, perfection of the performance, and maintaining the skills on stage for many years. In order to meet these needs, applications similar to sports medicine are required. Understanding the human voice begins with understanding movement, the fourth dimension of anatomy. As with Sports and Exercise Medicine, exercises regarding muscles are used to develop and treat the human voice. A vocal exercise is a pre-structured neuromuscular task based on functional anatomy, exercise physiology, principles of physical therapy and sports medicine, principles of motor learning, and behavioral change.

Singing voice therapy (SVT) has two aspects: habilitation and rehabilitation. It is important to consciously design the training/treatment programs of professional voice performers with the perspective of exercise physiology (Brown et al. 2006, Saxon et al. 1995). Habilitation is the process of enabling, equipping for, and capacitating the vocal performance level by providing solutions for the specific needs of a vocal performer. Rehabilitation, as in sports medicine, aims to return the impaired vocal performance level to a former condition through treatment principles. Since there is a disability, the performer needs to relearn a new set of sensory, motor, or cognitive tasks. SVT may be the primary treatment modality or secondary (during, before, after) to medication or surgery. (Denizoglu et al. 2021)

The exercises in SVT needs to provide answers to “what, why, how, and when” questions. Before starting exercise programs, the problem must be correctly identified. The diagnostic data will open the way to ‘what to do’ and then the treatment pathways about “how to do” solutions appear. The clinicians need to consider the muscle- specific exercise patterns those include answers to the “why” question (which exercise relates to which muscle). (Denizoglu & Sahin Orhon 2021). The final dimension concerns the timing of the exercises. The systematical planning of vocal preparations and exercises for the performance is defined as Vocal Periodization.

The vocal exercises are supposed to be structured according to the vector forces and fiber types of the related muscles in a specific motor task. In this sense, the clinician should be aware of the target muscle to be trained by manipulating the speed and type of the vocal exercise (Denizoglu & Sahin Orhon, 2021). Goals of treatment in singing voice therapy are objective and can be assessed by objective tests and assessments. We do aim to change the anatomy. The endoscopic appereance of the mucosa is an aspect, but the structural changes of the vocal organ are the reflections of altered protein organization the microanatomy under the mucosa. The muscle contraction pattern is changed which in turn, changes the gross anatomy; voice therapy never ends before changing the behaviour.

A professional artist who is also a vocal athlete maintains his level of performance, anatomy, muscle contraction pattern and behavior if he exercises regularly. On the contrary, if he does not exercise regularly, a decrease in muscle strength occurs. As is known from exercise physiology, exercise increases the intensity of muscle contraction. In the opposite case; If the muscles do not contract sufficiently, both their mass and contraction intensities are lost. The reflection of this situation on the sound is the weakening of the loudness, the narrowing of the pitch range and the degrading of the intonation (Denizoglu, 2020).

Professional vocal performance has two dimensions: artistic performance and sportive performance. The efficiency and sufficiency of various factors define the quality of these performance modalities. The artistic performance can be defined by time (rhythm), intonation (pitch), sound (blend), and expression (interpretation). These factors are elaborated through vocal training. On the other hand, sportive performance is defined by endurance, speed, agility, timing, focusing, and sustainability (Denizoglu et al., 2021).

The equivalent of professional vocal performance is the use of the human body as an instrument. In order for this special instrument to be structured, developed and brought to the level of professional performance, the striated muscles in our body must perform certain movements in an organized manner by contracting with a certain force. This is accomplished through various exercises. The muscles in the larynx and neck, which are primarily responsible for the production of the voice, and the respiratory and postural muscles must work in a certain organization. The meaning of this organization is as follows: The muscle group that will perform a movement organizes among themselves with different contraction rates. Naturally, it is expected that the muscle that needs strong contraction can reach the desired strength, and the muscle that is not desired to contract strongly should not show more contraction than expected. Therefore, not only the contraction force related fitness, but also the control mechanisms including motor learning will come into play. For this reason, in singing voice therapy and singing pedagogy, as in voice therapy, the exercises aimed at these muscles should be designed as “muscle specific” from the perspective of “exercise physiology” and transferred to the person through councious awareness, which will both affect the result more accurately and assist the person in finding the desired acoustic output. Based on this, the principles of training and exercises in sports physiology can

be adapted to singing pedagogy. These principles are: Specificity, overload, adaptation, rest/recovery, progression, retrogression/plateau/reversibility, maintenance, individualization, warm-up and cool-down (Denise et al., 2007).

Specificity corresponds to the identification of muscle-specific, situation-specific, and person-specific movement. Individualization is the personalized design of exercises. Exercises can be personalized according to the person's style, educational status, type of training, repertoire, stage program. In addition, warming the voice through exercises before the performance, which is one of the principles of exercise physiology, and cooling the voice after the performance, are the keys to staying on stage for many years without any problems.

The overload principle means applying resistance to the muscle during a muscle contraction. If this resistance is gradually increased with repetitive applications, this causes a gradual protein increase in muscle fibers and muscle cells. Repeated motor task (physical activity- exercise) creates adaptation mechanisms to resist the stress. During the progression process, muscle resistance is gradually increased. Of course, this has a limit. Then the muscle fibers adapt to this stress. If the exercise application is terminated and a decrease and regression occurs at this level, retrogrogression begins.

With the overload, progression, and adaptation cycle, several physiological consequences (increased strength, muscular hypertrophy, range of motion, etc.) are obtained, which results with increased efficiency, enhanced ability to perform the activity, higher level of performance, and more resistance to injury and disease (Macintosh et al., 2005).

Semi-occluded vocal tract (SOVT) exercises (Figure 1) can be considered as the SVT equivalent of overload in training principles. They are well known in singing pedagogy since they provide vocal economy and safety, muscular strength, and endurance to the performing singer (Laukkanen et al. 2008). SOVT exercises may be applied with devices (drinking straws, glass tubes, silicone tubes, masks, or valves) or without devices (trills, various consonants, hand-over-mouth, etc.). The resistance in an SOVT procedure may be continuous or alternate, and the backpressure may be obtained with low-to-high resistance levels (Denizoglu, 2013).

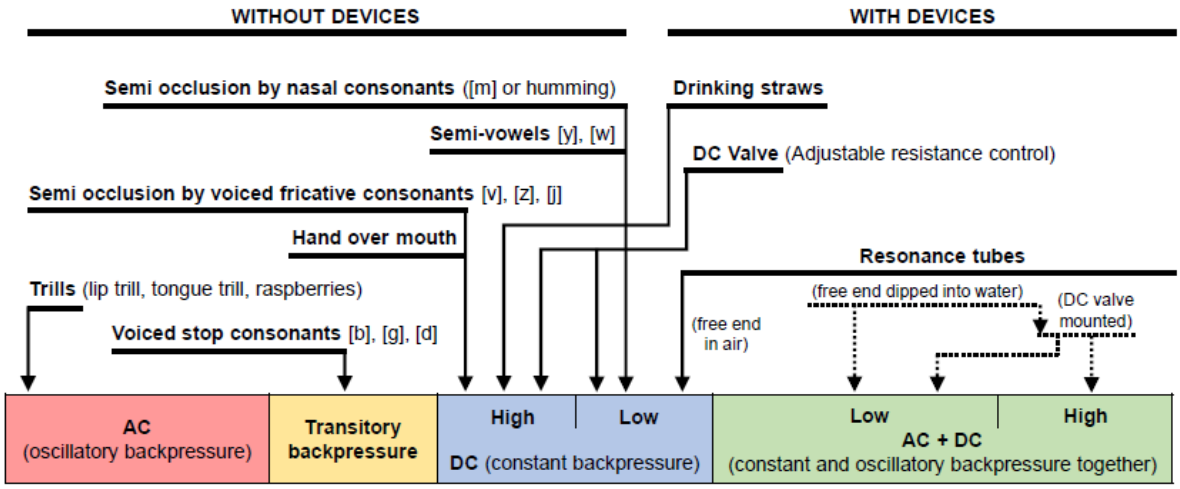

Figure 1: Semi-occluded vocal tract exercises

Periodization in Professional Vocal Performance

Periodization is being used in sports medicine and implies the systematic planning of training and exercise (Plowman et al., 2015). Based on the "use it or lose it" principle of the world of muscles, keeping fit both cognitively and sportively with a regular exercise program depending on the time and type of performance enables the person to reach the desired levels in terms of performance. Therefore, the adaptation of periodization to singing pedagogy is an important strategy for professional vocal performers who maintain their profession with their muscles.

Periodization may be defined as systematic planning of vocal habilitation due to performance schedule. Periodization process (Fig. 2) can be evaluated in three cycles: macrocycle (the yearly performance program), mesocycle (rehearsal for a specific performance or concert tour) and microcycle (the day of performance).

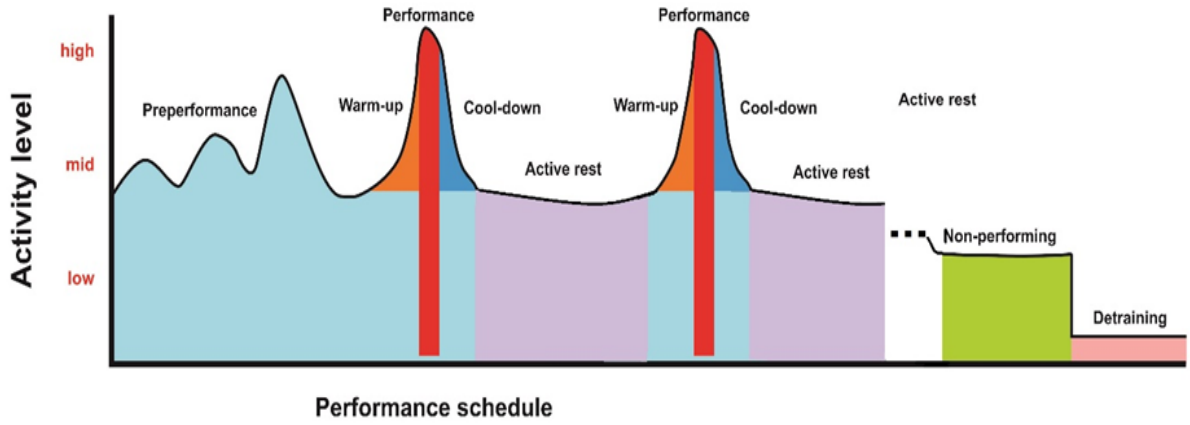

Figure 2: Periodization process

Preperformance Period:
This period includes the rehearsal study that may last weeks to months. Vocal skill and endurance (muscle development) exercises take place in this period. Exercises aimed at improving the vocal range and tessutura, increasing the strength and endurance of the muscles, works on artistic preparation (Lyrics, music, intonation, emphasis, semantics and role, costume, team harmony, stage control) and methods of coping with musical performance anxiety. The psychological preparation process, which includes stage self-confidence and motivation studies, is included in the preperformance period. In this process, SOVT exercises (trills, various consonants, hand-over-mouth, drinking straws, glass tubes, silicone tubes, devices) which are well known in singing pedagogy, can be used.

Peri-performance Period:
Peri-performance period is the day of performance that starts from the morning and includes vocal warm-up and cool-down procedures. The transition (active rest) period starts from next morning until the next performance day. It is a period after a performance to let tissues recover and keep the level of preperformance state.

Warm-up and cool-down exercises are indispensable for sustainable professional performance with the same strength and condition without injury. Passive and active warm up has the effect of increasing the temperature in the tissue. It also has metabolic, neural, and psychological effects. Vocal warm-up provides a better performance by increased elasticity in tessitura, precise control (agility and intonation), balanced loudness use and self-confidence (Low musical performance anxiety). Vocal warm-up programs also increase the fatigue resistance for longer performance and sustainable stage life.

The aim of vocal cool down exercises is to transform the state of intense physical activity into a normal activity state (ordinary conversation, or speech, level, resting muscular tonus). Cool

down reduces post-performance edema and fatigue and increases endurance in long term (Carrol, 2008).

Active Rest (Transition/ Recovery) Period:
The transition (active rest) period starts from the next morning of the performance day until the next performance day. It is a period to allow the tissues to heal after a performance and to maintain their pre-performance state. After the vocal performance, mild vocal mucosa edema and substrates of intensive metabolic turnover are cleared from the tissue. Muscle fatigue is also prevented in the active rest. This period may be 72 hours for soloist opera singer. (Not applicable if any pathological event occurs (haemorrhage, mucosal rupture, etc.))

Non-performing Period:
This is a long period of non-performance and pandemics is a good example for the non-performing period. The active performances are cancelled, but the activities of the vocal athletes must be maintained. Sportive vocal performance features deteriorate during non-performing period. Muscle strength and endurance are weakened, tissue flexibility and control are reduced, motor skills are deteriorated and increased musical performance anxiety with a decrease in stage confidence and demotivation are important considerations for the clinical approach.

During the non-perfoming period, the professional vocal performer should apply a vocal exercise program with conscious awareness for vocal sportive skills and vocal fitness. Vocal hygiene rules must be observed as belows:

- Mechanical trauma should be avoided.
- Laryngo-pharyngeal reflux should be avoided.
- Irritant inhalation such as smoking, volatile chemicals should be avoided.
- Hydration-Humidification should be given importance, 2-3 liters of water should be drunk in a day.

For staying vocally fit, the professional vocal performer should exercise at least one hour daily. Last but not least, proper diet and efficient sleep are important.

Detraining Period:
Detraining is a partial or complete loss of training-induced adaptations as a result of a training reduction or cessation. This is a serious issue for the singers who have been away from the stage for a long time for different reasons (retirement, health problems, etc.). Before the active stage performance a specific recovery program is needed. Muscles atrophy, downgrading motor cortex, deteriorating self consciousness, loss of motivation for stage performance may be encountered during the detraining period. Main principles and goals in detraining period include: Gradual strength/stretch training, voice range profile development, daily exercise program, repertoire revisited, stage rehearsal with orchestra.

Conclusion

Vocal periodization strategies aim to provide a physiologically-based training program to the professional vocal performer in order to help to increase the conscious awareness of the singer, and achieve and maintain a certain level of performance.

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