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Healthy Voices, Healthy Singers

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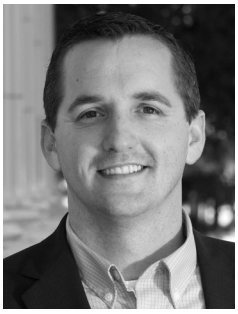

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At some point in our lives, many of us experienced some watershed moment, a musical experience so rewarding, so exhilarating, so moving, that we decided to dedicate our careers and much of our lives to the art of singing. Nico Castel reported that his moment came when, standing in the lobby of a hotel in San Salvador, the "Intermezzo" from *Cavalleria rusticana* moved him to tears (he was working as a toilet salesman at the time).[1] For Cristina Deutekom, it happened in an adult choir she joined in her twenties after having been barred from choral singing in her childhood because her voice was "too loud."[2] I am certain that any singing teacher reading this column could readily recall a similar experience that altered his or her life.

For each singer or teacher who has made the singing voice the focus of his/her vocation, there are countless others for whom singing is an essential element of their identity, even if they pay their bills using other skills. When asked, they can just as readily point to defining moments in their musical lives. In fact, positive or happy feelings are a common thread associated with singing across the spectrum of performance, from singing in the car, to community theater, to Covent Garden. If these feelings are so widespread, perhaps singing is doing something more than simply making us "feel good"? Could it be that singing actually stimulates physical responses in our bodies that can have significant impacts on our health and well-being?

This line of questioning is certainly not new; a number of researchers have made considerable efforts to quantify the potential health benefits of singing. Postulates range from a "mechanical effect of vocalization on the brain," wherein vibrations induced by phonation are transmitted to the skull and subsequently the brain to a positive effect on well-being among prison inmates who joined a multi-part choir.[3] The journal *Psychomusicology* even devoted an entire special volume to research on singing, and while there remains a significant amount of research to be conducted, preliminary results provide promising evidence that there are indeed positive health effects from singing.[4]

Several comprehensive reviews of the literature supporting the effects of singing on health and well-being have already been published, and that effort needn't be reproduced here.[5] Instead, the focus of this article will be first to define what it means to be healthy and what it means to experience well-being. Next, I will examine the physical and emotional impacts associated specifically with solo singing—omitting studies focused on benefits associated with the social relationships garnered from choral singing (significant as they may be). Finally, I will discuss what steps can be taken by teachers and coaches to maxi-

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mize health benefits of singing among their students, while also maximizing learning and skill acquisition.

"HEALTHY" OR JUST "NOT SICK"?

In the January/February 2015 edition of this column, Lynn Helding discussed problems with viewing all of voice pedagogy through the lens of pathology, only looking for faults that need to be fixed.[6] As an alternative approach, Helding referenced the idea that voice *rehabilitation*—restoring a voice back to a normal state—is a process related to, but separate from voice *habilitation*, defined by Ingo Titze as "the process of building and strengthening the voice to meet specific needs." [7] The medical profession has faced difficulty in defining nebulous terms such as health, wellness, and well-being. Early on, health was defined in biomedical terms as simply the absence of disease.[8] In the 1970s, psychiatrist George Engle proposed a more inclusive "biopsychosocial" definition that accounted for a person's biological, psychological, emotional, and social states when gauging a person's health status.[9] In a rather progressive move, the World Health Organization in 1948 proposed a similar definition of health to include "physical, psychological, and social well-being," and has since defined mental health as the "state of well-being in which every individual realizes his or her own potential, can work productively and fruitfully, and is able to make a contribution to her or his community." [10]

Just as Helding argued for use of the broader term "habilitation" in describing the work of singing teachers, I would like to discuss the health impacts of singing using these broader definitions of health and well-being. Many studies have examined the use of singing as a therapeutic or rehabilitative tool for individuals with ailments ranging from COPD to Alzheimer's Disease. However, in our role as voice teachers, we neither claim to be nor intend to act as medical clinicians or therapists. More applicable here, then, is research that suggests that singing can benefit the health and well-being of individuals, even in the absence of disease or disorder.

BENEFITS TO BIOLOGICAL FACTORS OF HEALTH

Given that singing is a physical activity, requiring fine motor control and stamina, physical changes associated with singing may be the first health effects that come to mind. Indeed, when Clift and Hancox asked 84 members of a university choral group to describe the perceived benefits of singing, 58% responded that they had benefited physically from their participation, with improved breathing and lung function being the most common effect reported.[11]

While scientific study of the effect of solo singing upon biological factors has been relatively sparse (much more work has examined choral singing), Valentine and Evans found a slight increase in heart rate immediately following a 30 minute solo voice lesson. [12] Interestingly, they also found a *decrease* in heart rate among a separate cohort of choral singers. The authors do not directly address this discrepancy, but I speculate that this difference could indicate that the choral singers were not required to sing at all times during the rehearsal, allowing singers time to listen passively to other singers at certain times, an activity that has been shown to reduce stress hormone cortisol.[13] It could also indicate that the relative anonymity of choral singing did not promote the same nervous response, and its corresponding elevation in heart rate, in the singers as did solo singing. While elevated heart rate may not in itself be a health benefit, exercises that increase the heart rate from a resting baseline heart rate can challenge the cardiovascular system in a beneficial way. Regularly challenging the cardiovascular system (as in daily voice practice), can help to lower the resting heart rate, which has been associated with an increase in cardiovascular health.[14]

Similarly, Grape et al. compared heart rate variability in professional singers (earning at least 24% of their income from singing) with amateur singers before and after solo singing lessons.[15] Heart rate variability (HRV) measures how much the heart rate varies in short term cycles such as inhalation versus exhalation or fast breathing versus slow breathing. A higher HRV measure is considered to be an indicator of improved cardiac health. The results of this study showed that HRV increased for both professionals and amateurs after singing, with professionals exhibiting higher HRV levels overall. The researchers suggest that these results provide some evidence that singing can lead to better cardiac health, with the benefit increasing with time and practice.[16]

Other research has examined the effect of singing on the immune system and responses to stress. The authors

measured levels of the Secretory Immunoglobulin A (SIgA) in choral singers and subsequently in solo singers.[17] SIgA is an antibody that plays a vital role in mucosal immunity, providing protection to mucous membranes throughout the body, including the mouth and vocal tract. Increased SIgA has been associated with well-being factors such as positive mood. The authors hypothesized that, if singing is indeed associated with positive mood, then SIgA should increase with active participation in singing. In both choral and solo singing, SIgA levels increased after performances, indicating that singing performance can be associated with short-term boosts to the immune system. Perhaps we should be telling our students to sing more frequently during cold season!

The increase in SIgA associated with singing, however, is not a direct response to singing *per se*. The reason that Beck et al. expected singing to be associated with positive mood was not simply because singing makes us happy. Instead, they posited that singing (especially solo or professional singing) is an inherently anxiety inducing endeavor. As such, if the singer copes successfully with that anxiety, the experience may result in "satisfaction with performance, feelings of positive emotional arousal, relaxation, and group fellowship."[18] This explains their interesting finding that, while SIgA increased with performance, it did not increase during rehearsal. The argument here is that rehearsal simply was not anxiety-inducing enough to provide the satisfaction and positive mood necessary to trigger the immune response. Also, while not clearly described in the researchers' findings, it stands to reason that if the singer was not successful in coping with the anxiety (e.g., performed poorly), he or she would also not receive the immune system benefit. This idea will be addressed again later in this article.

PHYSICAL EFFECTS ON PSYCHOLOGICAL WELL-BEING

Psychological well-being has proved just as difficult to define as physical health. Ryan and Deci defined it as "optimal psychological functioning and experience."[19] The same researchers make the case for inclusion of two previously opposing views of well-being,[20] namely *hedonic well-being*—measured subjectively by indices that evaluate pleasure, positive mood, and satisfaction with life; and *eudaimonic well-being*—measuring utilization of human potential by evaluating autonomy, personal growth, and purpose in life.[21] While these are complex designations with precise distinctions between the two, it may be helpful to think of a hedonic state as being happy, and a eudaimonic one as being fulfilled. Clearly, the two states are related in many ways, but distinct in others. It is also worth noting that attaining a state of well-being does not necessitate a state of physical health, as individuals can experience happiness and satisfaction with life while still exhibiting elements or poor physical health.[22] Singing can have effects on both hedonic and eudaimonic well-being, though very little research has examined eudaimonic well-being in relation to solo singing. Consequently, the focus here is on hedonic well-being.

Singing Makes Me Happy—Or Does It?

In the Beck et al. 2000 and 2006 studies, participants completed a series of self-report questionnaires designed to measure the subjects' levels of satisfaction with their performance as well as gauge the importance of singing on their personal identity. In general, subjects who recorded answers that would indicate high levels of hedoninc well-being also had the largest increase in SIgA.[23] This agrees nicely with the notion that those who are most successful in coping with performance anxiety will receive the largest immune system benefit from singing. The more interesting finding, especially as it applies to teaching, was that those singers who agreed with the statement "singing gives me identity as an artist" also exhibited an *increase* in negative emotions (unhappiness) and a *decrease* in SIgA.[24] That is, students who had made the decision that singing was a part of their identity and associated singing with their artistic career were apparently more critical of their performance, with actual negative health effects.

Kenny et al. studied performance anxiety in 32 professional opera chorus singers.[25] The study differentiated between situation-specific anxiety (state anxiety) and a general disposition toward anxiety (trait anxiety), and found this cohort of opera singers to have an overall high trait anxiety (3x higher than a normative sample).[26] However, even though these singers also reported high levels of occupational stressors (primarily concerning role ambiguity and physical working environment such as dust, smoke, and temperature), they did not

record any higher levels of state anxiety than a normative sample. One explanation for the low levels of state anxiety could be that, by the time singers have achieved this professional level, they have developed strategies to successfully cope with the related occupational stressors, even if they are predisposed to anxiety.

Finally, Grape et al., in addition to the heart rate variability described earlier, also used visual analogue scales to allow professional and amateur singers in Sweden to report being sad/joyful, tense/relaxed, and listless/energetic before and after 45 minute singing lessons.[27] Both amateurs and professionals reported feeling more energetic and relaxed after the singing lessons; however, only the amateurs reported feeling more joyful after singing. Again, this indicates that amateur singers are more likely to experience well-being as a result of singing than their professional counterparts, even if amateurs have less cardiac health, as the HRV results indicate.[28]

BUT WHAT CAN I DO?

All of these studies make interesting reading, and I would encourage examining the numerous studies that have examined the social benefits of choral singing. Yet the question remains, how can this information influence our teaching? If there are health benefits to be had from singing, don't we have some responsibility to help our students maximize those benefits? At the very least, don't we have a charge to help them avoid any negative health effects associated with our art?

The good news is that, in some respects, performance practices that increased SIgA production are remarkably similar to the practices that have been associated with motor learning. The March/April 2013 edition of this column focused on motor learning in our singing studios and ended with a list of "best practices" for maximizing learning.[29] In one way or another, most of those practices are aimed at creating challenges that the student must figure out how to overcome. In both Beck et al. studies, the boost to the immune system was dependent on the singer successfully coping with a heightened level of anxiety. In these cases, anxiety was related to performing in public; however, it is not a large leap to imagine that any number of studio practices could produce a beneficial level of anxiety. For example, asking a student to repeat a singing task (with the intent to improve upon the previous attempt, of course) without providing further instruction could provide a challenge to the student, difficult enough to induce some level of anxiety. If done regularly throughout a lesson, students could very well experience a beneficial immune response similar to that recorded following performance—with the added bonus of improved retention of newly-acquired skills. As another example, many studios and schools of music already encourage or require students to participate in regular seminars or master classes in which students perform in front of their peers. Beck's research would suggest support for continuing this practice and expanding it into studios not already providing this opportunity to their students.

Admittedly, it is somewhat strange to speak of anxiety in positive terms. Perhaps it is wise, then, to be reminded that in terms of both motor learning and immune system response, improvement is predicated on one key factor: the anxiety-producing challenge must be *surmountable* by the singer given their current skillset. Just as asking a typical 14 year old tenor to repeat a high C with no further instruction will not produce a positive motor learning effect, asking him to do so in a master class in front of his peers would almost assuredly not produce a positive health effect! It falls, then, to the teacher to seek out appropriate challenges for developing singers in order to maximize both health and learning effects. This requires understanding the developmental processes involved with learning to sing as well as an understanding of each of our students' skill level.

Related to choosing appropriate challenges for our students is the task of helping our students participate in constructive (as opposed to destructive) self-critique. Beck et al., Kenny et al., and Grape et al., all exposed the vulnerability among professional and aspiring professional singers to be hypercritical of their own performances to the extent that it negatively impacted their health and their performance. To be sure, the road to professional-level performance is not paved with unwarranted self-congratulation, but teaching our students how to critically evaluate their own performances and make necessary adjustments are two of the most important tasks we face as teachers. We already know that doing so is essential for our students' singing success, but there is now evidence that it may help them avoid negative health impacts.

With the research available, it appears that singing may have some impact on cardiac health. Additionally, Beck and his colleagues have provided some very intriguing evidence that successfully managing stressful situations such as public singing performance can have short-term benefits on singers' immune systems. Finally, precisely because singing can be a stressful endeavor, it can impact a singer's psychological well-being, either positively or negatively. While more research is needed to determine the degree to which solo singing at any skill level impacts overall health, there is already enough evidence to warrant teachers to consider this information as we evaluate our pedagogic strategies. Cardiovascular and immune system health and psychological well-being may have been far from our minds when we experienced our "watershed moment" that would propel us on our path to becoming singing teachers. However, as teachers, it now appears that we can play an important role in the health and well-being of our students.

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