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# Focus of Attention Research: A Review and Update for Teachers of Singing

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THE TOPIC OF *FOCUS OF ATTENTION* is not a new one to the “Mindful Voice” column and is highly relevant for all who train performers.<sup>1</sup> For those unfamiliar with the topic, focus of attention research is a subset of the motor learning field that attempts to answer the question: Where should performers place their attention during learning and performance? The past two decades have produced a sizable body of research in motor learning, mostly in the field of athletics, which seeks to determine the best focus of attention for optimal performance.<sup>2</sup> In general, most of these studies (about 180 of them) have found that an *external focus of attention* (focusing on the effect of a movement) is superior, in a variety of ways, to an *internal focus of attention* (focusing on the body movement itself).<sup>3</sup> For example, accuracy in golf performance improved when golfers were instructed to focus externally, on the movement of the golf club or on the trajectory of the ball, instead of internally on their arms or wrists.<sup>4</sup> Across all skill levels and a wide variety of disciplines, external focus of attention has been shown to improve movement effectiveness, movement efficiency, and movement form.<sup>5</sup> External focus also may promote automaticity and help performers to be more resistant to the negative effects of performing under pressure.<sup>6</sup>

Despite the robust body of literature supporting an external focus of attention, a fierce debate over the optimal focus of attention for the performance of motor skills rages on. This is unsurprising, given that focus of attention is arguably the most relevant aspect of motor learning to performers and their coaches. Admittedly, applying motor learning research to musicians is somewhat suspect due to the differences between athletic performance and musical artistry.<sup>7</sup> Conclusions from studies in disciplines other than singing must be regarded with caution and their applicability to musicians evaluated carefully. At the same time, there are many similarities between athletics and music performance, from the high level of motor control required to the immense pressure to perform well. These commonalities allow singers and teachers of singing to gather valuable and relevant information from the research done in athletics. Until relatively recently, there has been a dearth of motor learning research in the entire field of music.<sup>8</sup> Happily, the field of motor learning in music is growing and there are a number of new focus of attention studies involving instrumentalists and singers. This article will provide a review and update of the current state of research on focus of attention conducted across various disciplines, paying particular attention to potential implications for

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singers. It will also review recent research that has been conducted with singers and instrumentalists.

## DEFINING INTERNAL VERSUS EXTERNAL FOCUS OF ATTENTION

In general, internal focus of attention directs the performer's attention to the body and usually, the movement of a specific body part or parts.<sup>9</sup> In contrast, external focus of attention directs the performer's attention to the effect or result of the movement and avoids direct mention of the body.<sup>10</sup> For example, a voice teacher aiming to refine the [i] vowel might use an internal focus instruction and ask the student to "raise the back of the tongue higher." Restated as an external focus instruction, the teacher might say, "speak the word 'key' and then sing that same intensely true vowel when you sing it." In speaking the true vowel, the tongue will, in many cases, automatically find the correct position. External focus instructions are concerned with the goal of the action (i.e., to achieve a pure, unadulterated vowel), rather than the action itself (i.e., lifting the posterior portion of the tongue). It also should be noted that imagery and analogies often are categorized as external focus in the focus of attention literature.<sup>11</sup> For example, phrases such as "thread the needle" and "sing like you are beginning a yawn" would be considered external focus since they do not make direct reference to the body.

Often there is a fine line that distinguishes internal and external focus. Sometimes altering only a word or two can change the instruction from one that is considered internal to one that is considered external.<sup>12</sup> For example, the first study that investigated the effects of focus of attention evaluated participants' balance learning based on two different attentional foci: 1) focusing on their feet on a balance platform (internal focus), or 2) focusing on the markers fixed to the balance platform (external focus).<sup>13</sup> Performance and learning improved when instructions changed from the internal instruction "keep your feet at the same height," to the external instruction "keep the markers at the same height." Comparatively, for singers working on feeling grounded, the difference between "feel your feet supporting you" and "feel the floor supporting you" may not seem significant, but this one word difference effectively changes the instructional categorization from internal focus to external focus.

## HOW FOCUS OF ATTENTION IMPACTS MOVEMENT

Let us look more deeply at how focus of attention impacts motor performance and learning in the areas of movement effectiveness, movement efficiency, movement form, and automaticity. Note that levels of motor *performance* measure immediate performance gains or losses, but do not necessarily correlate with motor *learning*, which is typically assessed with retention or transfer tests administered at a later time. The use of the word "performance" in the realm of scientific inquiry also lies in contrast to the use of the word in the world of singing, which implies a concert stage or audience, and is distinct from technical training or practice.

### Movement Effectiveness

In motor performance, effective movements are characterized by accuracy, reliability, and consistency. For athletes, movement effectiveness is often measured by accuracy in hitting a specific target, and in many studies in motor learning research, accuracy has been shown to improve with the adoption of an external focus of attention. Soccer players exhibited improved kick accuracy when instructed with cues inducing external focus (e.g., "be behind the ball, not over it, and lean back"), rather than internal focus cues (e.g., "position your bodyweight and the nonkicking foot behind the ball").<sup>14</sup> Likewise, accurate throwing of balls, darts, and Frisbees was enhanced through the use of external focus of attention.<sup>15</sup>

In music, measures of temporal evenness have been used as one way to examine movement effectiveness. In one of the first studies of attentional focus and musicians, Duke et al. directed music majors at the University of Texas at Austin (participants were advanced pianists and non-pianist instrumentalists) to perform a simple passage of sixteenth notes as evenly as possible (an indicator of excellent motor control) under four different focus of attention conditions.<sup>16</sup> The results, as measured by computer analysis, showed that when the performers focused on the effect of their movement (the hammers or the sound) rather than more proximal targets (fingers or piano keys), temporal evenness improved among the non-pianist instrumentalists. The results of expert pianists showed no difference in evenness, which likely indicates that the task was in fact too simple for these

subjects and they were not being forced to acquire a new skill in the same way as their non-pianist counterparts. This replicates research in gymnastics and swimming regarding the notion that there may be a ceiling to the effects of attentional focus for elite experts.<sup>17</sup> Still, results may have been different if the task had been made more difficult for the skilled pianists, and there are many studies showing benefits of external focus for experts.<sup>18</sup> Duke's study points to the value of external focus of attention for beginning learners, which is echoed by many focus of attention studies performed with novices in varying disciplines.<sup>19</sup> However, in a study similar to Duke's, but conducted with 7th grade band students, no significant differences were found between internal and external focus conditions with regard to temporal evenness.<sup>20</sup> It could be that the attentional focus effect is less potent in children (due to a variety of factors), and a couple of recent studies also have shown no differences between different attentional foci when the subjects were children.<sup>21</sup>

Another way to measure movement effectiveness for musicians is in terms of pitch accuracy. In her 2019 study of natural trumpeters, Williams found that external focus practice protocols (imagery, singing, gesturing, playing different variations, and avoiding verbal instructions as much as possible) had a positive effect on pitch accuracy, a variable easily measured with natural trumpeters, due to the fact that inaccuracies are quite obvious on the instrument and there is a slim margin of error.<sup>22</sup>

In an important 2019 study with a variety of skilled musicians (including four singers), Mornell and Wulf found that external focus of attention led to improvements in musical expression and technical precision, compared to an internal focus of attention.<sup>23</sup> In the first experiment of the study, the musicians were asked to perform a piece of their choosing that they felt they had mastered both technically and musically and were assigned to one of three groups: external focus, internal focus, or control. In the first group (external focus), the musicians were asked to focus on playing the music expressively to the audience. The internal focus group focused on the precision of their finger or lip movements and performing the correct notes. The control group was not assigned a focus of attention. Two expert raters, university professors with professional performance careers and years of experience adjudicating music

competitions, watched video recordings of the musicians and were uninformed of the instructed attentional focus. Each of the trials was rated in terms of technical precision and musical expression on a scale from 1 to 9. The ratings showed that there was a significant increase in musical expression in the external focus condition, as compared to the other two groups. The external focus group had better technical scores, but did not reach statistical significance.

In the second experiment of the same study, three expert raters (one of whom was also a rater for Experiment 1) were provided more detailed scoring criteria for both technical precision (notes, rhythm, phrasing, dynamics, fluency of movement) and musicality (expression, tempo variations, interpretation, mannerisms, and stage presence). The musicians were from a different university than those in Experiment 1 and were instructed to perform a piece that they could play well, preferably one they had performed in concert. In this experiment, the external focus condition resulted in significantly higher ratings for technical precision and musical expression, as compared to the internal and control conditions. Consistent with many previous studies, the internal and control conditions were similar in performance quality, pointing to the possibility that musicians may tend to focus internally when not instructed to place their focus elsewhere.<sup>24</sup>

These studies with musicians provide some initial evidence that external focus of attention has a positive impact on movement effectiveness, as measured by temporal evenness, pitch accuracy and overall technical precision. More studies undoubtedly are needed to match the robustness of the findings in fields outside music, but these preliminary results should be regarded with real interest by all those involved in voice training.

### Movement Efficiency

When two identical movements are performed, but one is accomplished with less energy expenditure and increased fluidity, that movement is considered more efficient. Movement efficiency is often assessed by the degree of muscle activation, measured by electromyographic (EMG) activity. Higher EMG activity signals greater energy expenditure and likely lower efficiency. Few EMG studies have been performed in singers and none in relation to focus of attention. As a result, we

must settle for gleaning potential connections from studies done in laboratory settings using athletes. Multiple studies have shown reduced EMG activity of agonist and antagonist muscles and fewer co-contraction of muscles when performers focused externally (e.g., basketball players focusing on the basket instead of their wrists).<sup>25</sup> What's more, in internal focus conditions, EMG activity was higher in muscle groups that participants were not explicitly told to focus on, implying that internal focus on a specific body part can affect other muscles and compound inefficiency.<sup>26</sup> This research on co-contraction and increased EMG activity of extraneous muscles may have implications for singers: It is possible that internal focus could cause singers to overwork and recruit muscles other than the primary ones needed for singing tasks. A singer focusing on keeping a low larynx, for example, which is a common directive to improve vocal tone and resonance, may inadvertently recruit the very powerful hyoglossus muscle (an extrinsic muscle at the base of the tongue), to aid in laryngeal depression. While the tongue is often successful in lowering or stabilizing the larynx, it does so at the expense of free oscillation of the larynx, which leads to a stiff, often out of tune sound.

Speed and agility are common markers of excellent movement efficiency in both athletics and music. One study revealed increased running speeds when participants focused externally on an agility task, as compared to an internal focus or a control condition.<sup>27</sup> Other studies also have found increased speed as a result of external focus of attention.<sup>28</sup> Singers cultivate agility, and the ability to sing quickly is often correlated with an efficient instrument unencumbered by undue and unnecessary tension. Further research with singers could explore the effects of focus of attention on vocal agility and coloratura singing.

Increased endurance is another indication of the efficiency of movements. Excellent vocal endurance is required of singers who must perform for hours at a time. In running, endurance is commonly measured by the amount of oxygen consumption ( $\dot{V}O_2$ ) for a given running speed, with lower rates of oxygen consumption indicating increased endurance and efficiency of physiological resources. Multiple studies have found oxygen consumption increased, and therefore running economy decreased, in runners who used an internal focus of attention.<sup>29</sup> Efficient oxygen consumption is related to

a singer's ability to sustain long phrases and has been shown to increase as vocal task difficulty increases.<sup>30</sup> It would be interesting to investigate oxygen consumption in singers performing the same vocal task under different attentional foci. If the results mirrored the runners, external focus would require reduced oxygen consumption for the same vocal task, resulting in increased efficiency and, therefore, vocal endurance.

A lower heart rate is another indicator of endurance and can also be linked to a greater resistance to stress. Heart rate was found to be reduced in externally focused participants doing sit-ups.<sup>31</sup> Another study, in addition to finding that external focus increased accuracy in dart throwing, also found a deceleration in heart rate in externally focused participants, compared to an increased heart rate in internally focused participants.<sup>32</sup> Like higher oxygen consumption, increased heart rate is a common symptom of performance anxiety and is sometimes treated in musicians with beta-blockers, which lowers the heart rate, thereby alleviating some effects of the fight or flight response. If external focus can reduce heart rate and reduce oxygen consumption, both signs of increased calm, it is feasible that performance anxiety could be at least partially mitigated through the use of external focus of attention. The effects of focus of attention on performing under pressure will be explored more later.

### Movement Form

Some skills are measured not only by accuracy, speed, endurance, and strength, but also in terms of movement form. In certain body-centric disciplines, such as gymnastics, figure skating, and dance, excellence in form is the main parameter by which these skills are judged. For singers, flaws in form can be an indication that vocal technique has been or will be compromised. Aspects of a singer's posture, mouth shape, laryngeal position, or vocal tract shape, are all examples of movement form in singing.

A study with gymnasts and a study with soccer players showed higher expert ratings in regard to movement form when the participants used external focus of attention, as opposed to internal focus.<sup>33</sup> Learning of optimal movement form also has been shown to improve with external focus instructions. One study looked at teaching novice golfers to shift their weight forward in order to

achieve the ideal angle between the shoulders and pelvis during a downswing. The internal focus instruction (“shift your weight to the left foot”) was less successful in increasing the angle and resulted in decreased carry distance of the ball when compared to an external focus instruction (“push against the left side of the ground”).<sup>34</sup> To improve movement form in the voice studio, a teacher training a singer to adopt a more vertical mouth position in the *passaggio* might use tape markers on the cheeks. Instead of referring to mouth position, lips, or cheeks, the teacher could instruct the student to decrease the distance between the markers on the cheeks, thereby causing the desired rounding of the mouth, while at the same time, inducing an external focus through the use of props. Empirical investigations of the efficacy of different technical methods is something voice teachers have been doing for centuries, and comparing directives through the lens of focus of attention could be an important variant of this practice.

Tone quality, which could be considered a result of movement form in singing, has been used as a method of determining the effect of different foci of attention in four recent studies with singers. In the first study, in which the participants were untrained singers, ratings by three expert listeners revealed that tone quality was improved from the baseline condition when participants were instructed to focus externally on the sound produced by their voices (e.g., aiming the sound to their fingers on the “mask,” a microphone, or a spot on the wall, rather than internally on the vibrations in the throat).<sup>35</sup> This study also supports the research that shows benefits of external focus of attention in novices, due to the fact that the singers in this study were untrained.<sup>36</sup>

Effects of several different foci were also explored by Atkins in another study with 20 trained singers of various voice types.<sup>37</sup> In this study, each singer performed four separate singing tasks under a baseline condition and six separate focus of attention instructions. Atkins and a second expert listener (who were both blind to the focus of attention conditions used in individual trials) completed the ratings. Results showed that “ring” (the quality that allows a singer’s voice to project) and overall tone quality were higher when singers focused their attention farther away from their own bodies, which replicates many studies that have found a “distance” effect in regard to optimal focus of attention.<sup>38</sup> The instruction to

“fill the room with sound,” an external focus cue, resulted in superior ratings, whereas instructions to focus on the soft palate and more proximal targets earned reduced ring and overall tone quality ratings.<sup>39</sup>

In a separate study with 12 trained singers, Atkins again found that three expert listeners rated the external focus conditions more positively than the baseline and internal focus conditions.<sup>40</sup> These results confirm the findings of her doctoral dissertation, which also found that external focus enhanced ring and overall vocal quality, with more distal targets improving performance.<sup>41</sup> Improved ratings of tone quality in these studies signal that singers may indeed benefit from external focus of attention and that voice teachers might want to look for ways to draw singers’ focus further away from the body.

### Automaticity

Many would agree that one of the hallmarks of an elite singer is the ability to perform with a certain degree of automaticity, wherein there is a reduced amount of conscious control over movements. The *constrained action hypothesis* postulates that an internal focus of attention engages a conscious type of control that inhibits the motor system, thereby impeding automaticity.<sup>42</sup> External focus, on the other hand, has been shown to promote automatic control processes that may lead to more fluid and regular movements.<sup>43</sup> Higher frequency and lower amplitude movement adjustments were found in externally focused participants completing a dynamic balance task, as compared to internally focused participants, signifying reflex-like control.<sup>44</sup> Wulf, Töllner, and Shea summed it up nicely: “As a consequence of the more automatic control processes, corrective movement adjustments occur more frequently and at a faster rate, thus minimizing errors and generally improving performance.”<sup>45</sup> The argument is that the body naturally self-organizes for a wide variety of tasks, and when a person tries to self-monitor and deliberately control movements, this often limits the ability of reflexive and unconscious control processes to activate. Wulf and Lewthwaite further contend that external focus can help novices achieve higher levels of performance sooner, with their movement kinematics approaching those of more expert performers.<sup>46</sup> Ballet teacher Guss-West commented that, “We’ve always taught that, especially with beginners, we had to break down every little movement.

But in my experience, that produces paralysis.”<sup>47</sup> Despite the fact that ballet is a body-centric activity (much like singing), Guss-West still avoids internal focus by using many analogies in her teaching of dance to all levels, thereby inducing external focus and consequently, automatic control, as much as possible.

Similar to using analogies, the use of primal sounds in the voice studio is a good example of teaching that attempts to tap into automatic control processes. For example, in learning to achieve a high belt sound in music theater, utilizing a “calling” voice can be fruitful because it often automatically sets the singer up with the correct breath pressure, vocal fold thickness, and laryngeal placement. Attempting to control these parameters physically and in an internally focused manner may be difficult, if not impossible due to the myriad moving parts involved. Like primal sounds, aiming the sound to the back of the room or imagining the perfect sound before singing are excellent examples of external focus directives in their purest form because the effect of the body movement is the focus, rather than the body movements themselves. The aforementioned external focus instructions may encourage automaticity because the body parts tend to self-organize in order to achieve the target sound and all mention of the body, which according to the constrained action hypothesis may inhibit the motor system, has been removed. Of course, for singers the body is the instrument and thus, it is likely impossible for teachers to solely use external focus directives, especially regarding certain aspects of vocal technique. It should also be acknowledged that there is seemingly a spectrum ranging from highly externally focused to highly internally focused, with plenty of variation in between.

## PERFORMING UNDER PRESSURE AND THE ROLE OF FOCUS OF ATTENTION

In motor learning theory, a high degree of transferability to another task or different conditions is an indicator that something has been learned well.<sup>48</sup> Perhaps for singers, the ultimate transfer test is an audition or concert, where the pressure to perform well is high and performance anxiety may come into play. While there are many treatment options purporting to ease the grip of performance anxiety, an effective “cure” has yet to be

found.<sup>49</sup> Related to and often caused by performance anxiety is *choking under pressure*, which is defined as “an acute and considerable decrease in skill execution and performance when self-expected standards are normally achievable, which is the result of increased anxiety under perceived pressure.”<sup>50</sup> The professional basketball player who misses the free throw shot or the opera singer who cracks on the high C on opening night both might be considered victims of choking.

Teachers arguably have an obligation to train their students in a way that will provide the most resistance against choking. There is some evidence that an external focus of attention can actually enhance performance in pressure filled situations, compared to an internal focus, and therefore deserves attention from all who train performers.<sup>51</sup>

## Self-Focus

There seems to be something about thinking about oneself that tends to derail performance, which may be why singers and actors are commonly told to think about what their character would be feeling, rather than what they, the performer, are feeling. Indeed, it has been shown that just thinking about the self and past performance can be a “trigger” that causes decrements in performance.<sup>52</sup> Self-focus theories maintain that pressure to perform well increases self-consciousness and unduly brings the performer’s attention to skill execution, usually in a step by step fashion that is typically the purview of novices.<sup>53</sup> The more attention that goes to the self, the more likely the performer will over-regulate body and motor processes. Beilock and Carr include the *explicit monitoring theory* in their explanation of reasons why choking under pressure occurs and postulate that choking is a function of attending to the process of skill execution (how to perform a task) under situations of anxiety.<sup>54</sup> Under pressure, performers often become anxious and in many cases, may unnecessarily break down their skill-based knowledge in an earnest and well intentioned attempt to perform well. Skills and body movements that had been fluid and under unconscious control may suddenly become halting, inept, and awkward.

In a study of skilled pianists, it was shown that in conditions of pressure (a competition) the musicians had higher levels of EMG activity of proximal muscles

and antagonist muscles when compared to EMG activity of those muscles during rehearsal.<sup>55</sup> Since, as explained in a previous section, several focus of attention studies have shown the same muscular overactivation with internal focus of attention under nonstressful situations, it is possible that performance pressure induces internal focus and may also compound its effects. For example, if a voice student is internally focused in lessons, according to the constrained action hypothesis, the motor system may already be slightly constricted. When the same student goes to an audition, muscular activation is increased due to the pressure of the situation. The student may then increase self-focus as a coping mechanism, which can lead to a rise in internal focus of attention, which further interrupts automatic control processes, increases extraneous muscle activity, and generally constrains the motor system. The potential result? Choking.

It appears that the type of attentional focus used during training can have an impact on performance under pressure, with external focus potentially providing protection against the detrimental effects of pressure. In a study on field hockey and soccer players performing dribbling tasks, researchers found that internal, skill-focused attention caused a decrement in performance, which increased cumulatively under pressure.<sup>56</sup> In contrast, Ong, Bowcock, and Hodges found that technical instructions that were externally focused allowed participants performing a disk throwing task to acquire these skills more quickly and maintain them under pressure, as opposed to participants who received internally focused technical instructions and whose performance did show detrimental effects of stress.<sup>57</sup> In a 2019 study with surfers, higher levels of performance were found with both novices and experts under external focus conditions during both practice and the stress of competition.<sup>58</sup> Performing under pressure is a difficult phenomenon to study directly in musicians due to the complex nature of musical performance. Still, interviews and surveys with dancers and musicians did find that these performers experienced less nervousness when performing in external foci conditions, as opposed to internal foci conditions.<sup>59</sup>

In a 2018 study about high level athletic coaching, all coaches preferred to make technical changes to an athlete's skill during the off season.<sup>60</sup> Likewise, Lynn

Helding admonishes singing teachers to stop teaching in the days leading up to a performance.<sup>61</sup> Upon reflection and consideration of the explicit monitoring theory, this recommendation makes perfect sense and may be especially applicable to teachers who employ a high number of internal focus directives. The problem may not be the amount of feedback given, but rather the nature of that feedback. In one study, high frequency feedback was shown to enhance learning, when compared to reduced feedback, if the feedback promoted an external, rather than an internal focus.<sup>62</sup> In any case, the closer the singer is to the performance stage, it may be advisable to prioritize those directives inducing external focus, if any instructions are going to be given.

### Explicit versus Implicit Learning

There is a compelling body of research that suggests that having too much explicit knowledge available about how to properly perform a task can negatively impact performance, and especially performance under pressure. Learning a skill explicitly involves declarative learning and requires conscious, effortful awareness. In contrast, in implicit learning the learner may not be aware of the details necessary to perform the skill and direct instructions are minimized. In the realm of voice and focus of attention, internal focus of attention instructions tend to be more explicit (e.g., "Lift your soft palate"), while external instructions are more likely to be implicit (e.g., "Inhale as if you are smelling a beautiful rose"). The singer hearing the latter instruction may not be aware that the instruction is meant to impact the position of the soft palate, although the teacher has (and arguably should have) a deep understanding of that fact.

The question is: For complex skill learning, is it necessary to learn formal rules as a pathway to achieving excellence? Explicit instructions may be required during the learning phase, but most performers hope to achieve a level of automaticity by the time of performance, effectively allowing them to focus on other things. Indeed, singers often are told to completely forget about their technique during performance and focus on expression and drama. For some, it may be impossible to do so, and the *theory of reinvestment*, similar to the explicit monitoring theory, posits that anxiety may cause performers to revert to an earlier stage in the learning process that included conscious processing and explicit, rule-based

directives as a way to control movement.<sup>63</sup> So even if in rehearsal the singer was not thinking about specific aspects of technique, performance fears can cause a “grasping at straws” effect and leave one desperately searching for help in surviving a stressful performance. A singer who is worried about a high note may strategically search her memory for explicit instructions she received while learning (e.g., open the back of the throat), which unintentionally may hurt her performance rather than help it, due to the internal focus nature of that instruction. Let us examine the evidence regarding implicit learning and its effects on performance under pressure.

In a study that involved the learning of a golf putting skill, participants with less explicit knowledge (no instructions) of how to perform the skill performed better under conditions of stress than those who learned the skill explicitly (with a specific set of instructions).<sup>64</sup> A recent study found that explicitly instructed participants choked under pressure in a motor sequencing task and that limiting awareness of the skill (through implicit learning) protected participants from the negative effects of pressure.<sup>65</sup>

Similar findings concerning performance under pressure were found with analogy learning, which has been compared to both implicit learning and external focus of attention learning.<sup>66</sup> Analogy motor learning uses metaphors and imagery to teach complicated movements. Notably, in one of these studies, both the implicit group (those who were taught with an analogy) and explicit group showed equal rates of learning and retention, but then diverged when they were put under pressure, with the explicit group showing a degradation in performance and the implicit group maintaining performance levels.<sup>67</sup> So even if the instructions do not hurt skill execution during practice, there is the possibility that these same instructions could have a negative impact on performance. There is also evidence that internal focus instructions are actually remembered more accurately than external focus instructions, even when they degrade performance.<sup>68</sup> Perhaps this is due to the increased conscious processing necessary for explicit instructions. Alternatively, it may be that the added complexity of the instructions might cause those instructions to be processed for a longer time in working memory. While seemingly advantageous, this better

memory for internal focus instructions could come back to haunt performers under stress.

One voice teacher facetiously commented to this author, “You don’t need to be smart to be a singer.” Although tongue in cheek, the implication is that vast amounts of explicit or declarative knowledge is not necessarily needed for learning procedural skills, and perhaps many singers would do better without them. Rather, trusting in the intelligence of the body and giving instructions that limit demands on working memory and conscious processing seem to be important in attaining excellent performance under pressure. Teachers of singing, on the other hand, should be armed with as much knowledge as possible about the inner workings of the voice and body. When, if, and how they share that information with students is the defining factor.

## CONCLUSION

The evidence accumulated in the past twenty years about the benefits of external focus of attention is impressive. External focus has been shown to positively impact movement effectiveness, movement efficiency, and movement form. External focus also may encourage automaticity and may contribute to increased resistance to the effects of pressure. In line with the research done in other fields of practice, the results of studies with singers and instrumentalists offer burgeoning evidence that an external focus of attention may enhance music performance.

In future studies, it will be important to examine more diverse attentional foci instructions and perhaps utilize instructions found in actual voice studios. Comparing the effects of different foci of attention on the performance of various vocal tasks (such as agility, staccato, onset, resonance, and articulation) could be informative. A more involved study might look at learning (measured by retention and transfer tests after a series of several days or weeks) in novice and intermediate singers using contrasting foci of attention. And, of course, the effects of different foci on levels of performance anxiety and choking is a highly relevant and important avenue of study.

Based on the research presented in this article, this author suggests that, in general, external focus instructions should be given first before employing internal focus instructions. When external focus does not yield



the desired results, it may be time to try an internal focus instruction, with the understanding that a dogmatic devotion to external focus in all instances is certainly not required nor advised. Rather, whenever possible, teachers may want to attempt to “translate” the body focused instruction into an externally focused instruction, all the while engaging in relentless trial and error (a hallmark of voice training) to empirically decide which approach works best for each individual student and for each technical challenge. This type of translation may take an extra step for the teacher and seem less direct and expedient for those well versed in anatomy and physiology, but the rewards, in terms of movement effectiveness, efficiency, and movement form, may be substantial. In the end, going through the process of reframing teaching directives in an externally focused manner might be a stimulating exercise in creativity that simultaneously enriches a teacher’s arsenal of unique teaching tools and sparks the imagination of both teacher and student.

## NOTES

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