2. Motor and Kinaesthetic Imagery

In the first of this series we introduced the idea of motor imagery and the kinaesthetic or felt aspect that is necessary in the training of singing to coordinate muscle. Now it would be helpful to have a definition of this.

Motor imagery is the accurate imagination of a physical movement. When the sensations of this movement are also felt through imagination, this is described as kinaesthetic motor imagery (KMI). This is the form that we are discussing in the context of singing, but a similar kind of imagery has been applied in medicine for stroke rehabilitation (see below).

KMI is also one of the several forms of mental imagery that may be used in sport, performing arts and musical training. It is important to note that in these disciplines the term has a broader definition and includes mental rehearsal which is not the concern here. Here, our focus is on the coordination of the muscles of singing to achieve specific technical goals.

Digging deeper into the *term motor imagery* it is first important to distinguish it from other forms of imagery that sometimes appear under the same umbrella. Mental imagery, for example, has several goals, often encompasses non-motor imagery, uses visualisation but has different objectives from those associated with technical vocal training such as learning music, rehearsing lines, movement across stage and characterisation.

In medical rehabilitation, specifically stroke, patients are encouraged to regain lost movement following brain injury by imagining carrying out a specific movement such as reaching for and grasping a pencil. Recovery depends on rebuilding neural circuits within the brain involved in both sensation and the control of movement.

In a parallel way, the complex movements required of athletes and dancers can be also be refined through kinaesthetic motor training where performers mentally rehearse movements and the sensations in their bodies that are associated with them.

Instrumental musicians use a motor form of mental rehearsal in which they visualise playing a piece they are learning without actually touching the instrument. Studies have found that this practice activates many of the same parts of the brain as when actually playing the instrument and has been shown to improve accuracy and quality of playing (see references at the end of this article).

These methods all enhance varying aspects of performance and/or movement. In singing, however, we are looking at a far more complex dance, in which a large number of muscles

are acting in multiple co-ordinations. In addition, the majority of these movements, being inside the body, cannot be easily seen or felt. There is also a substantial crossover of muscle function, given that the muscles of singing are also used in posture, movement and respiration.

Our questions, therefore, for vocal pedagogy, are as follows:
What form should KMI take when applied to the teaching of singing?
What is going on in the brain during KMI?
What are the aims and objectives of KMI in singing?
How does this differ from its use in other disciplines.
What kind of a technique can be created to access and coordinate these muscles?

These questions will be approached in subsequent articles.

Section 2 refs

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