Gesture as a communicative tool in vocal pedagogy

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Background in qualitative performance analysis. Gesture has an impact on the expression and communicative process. It is through the use of gesture that inner cognitive processes are translated into external form. These gestures can be thematically coded to elucidate the information transmission system, in which gesture plays an active constructive role linking thought and gesture. The implications of these ideas are critical when understanding music performance and vocal pedagogy. Vocal instruction utilizes gesture to express images that cannot be expressed in speech. Within this context speech and gesture must cooperate to express the person’s meaning. (McNeill, 2003)

Aims. This research project focuses on how interpretive gesture enhances understanding of musical expression and vocal techniques in musical instruction. Interpretive gesture is a gesture that seeks to communicate to others one’s own understanding and comprehension of an idea to help form a shared understanding. The research presented is guided specifically by the research question of how gesture functions in embodied understanding in vocal pedagogy.

Embodied understanding presents a problem in vocal pedagogy. Singing involves complex physiological and psychological processes. A teacher must identify and communicate the intricacies of vocal performance when instructing students. As linguistic communication alone often fails to provide a comprehensive understanding of the intended goal, nonverbal communication tools, such as gestures, may provide valuable assistance in the improvement of vocal performance. Students also need to develop their own understanding. In this case, gesture may function as a form of evaluation, to express understanding of instructional concepts. The results of the current research project may serve to improve musical instruction and enhance understanding of vocal technique; its methods may also be a useful addition to those employed in the analysis of vocal performance in ecologically valid contexts.

Main contribution. This paper presents an overview of the methodology and preliminary results of a study examining the use of gestural articulation in vocal pedagogy, considering the topic through the lens of embodied music cognition. Leman (2008) presents a model of musical communication whereby biomechanical energy is encoded and decoded. This model seeks to conceptualize musical communication in terms of interpersonal interaction resulting in an action-reaction cycle involving haptic, sonic, and visual feedback. This model of communication is applied directly to the area of vocal performance and further extended through the application of joint action and schema theories. The integration of these theories came about as the result of observing behavior in voice lessons given by 3 expert teachers to 6 students. The lessons were video-recorded and coded thematically at multiple levels on the basis of previous literature on gestural communication, particularly in vocal pedagogy. In addition discourse analysis (as related to gesture) and questionnaires were utilized for triangulation, to increase the validity of the researcher’s findings and to check for the relevance of the conclusions of the study.

Implications. These preliminary data were used to develop a theoretical model on which to base further research. In the voice lessons, it was found that communicative efficiency in the voice lesson is enhanced through gestural interaction, specifically as a representation of internal physiological processes, joint action, and intentional matching. Communicative interaction through gestural chaining and replication of gesture assisted in communicating the embodied intentions of the participants in the voice lesson and refinement of the students’ musical performance.

Keywords: Embodied Music Cognition, Vocal Pedagogy, Gesture, Human Communication.
**Introduction**

In vocal instruction, gestures are utilized regularly and intuitively. Gesture has an impact on the expression and conventions of language. It is through the use of gesture that inner cognitive processes are translated into external form. These gestures can be coded into an information transmission system, in which gesture plays an active constructive role linking thought and gesture. The implications of these ideas are critical for understanding effective communication during singing and pedagogy. The teacher is frequently required to describe complex internal physiological processes involving intricate muscular coordination to students. However, the complex physiological mechanisms that are involved in efficient vocal production are not readily available for external visualization in a typical classroom. Linguistic communication, alone, often fails to give a comprehensive understanding of the intended musical and physiological goals of the instructor. Furthermore, it may be difficult to relate physiological processes involved in proper tone production to intended musical goal and/or tactile sensory process using only linguistic descriptors. Teacher and student use gesture to develop a common understanding of ideas of vocal technique:

The studio presents an intimate situation in which two people, pupil and teacher are there to create an artistic form of communication together. The achievement of this goal is equally important to both participants and their relationship needs to reflect this joint adventure (Bunch, 1997, p.18).

Singing represents a form of procedural knowledge with a foundation in sensory embodied processes:

Learning to ride a bicycle involves doing it until you get the feel of it. Then one wonders when it wasn’t possible to ride. What happened between not knowing and knowing how to ride is similar to singing. It is a matter of sensory-motor understanding and almost any singer knows when he or she has it because it feels wonderful (Bunch, 1997, p.19).

According to Bunch, singing involves from sensory awareness coupled with physical freedom and dynamic balance of muscular activity throughout the body:

Many singers’ problems can be observed visually in their posture, breathing patterns, and tension in the arms, chest, neck, and face. Since these problems are physical and sensory, it is virtually impossible to change them with verbal instructions only. The student has to sense the difference in order to change and the teacher needs the knowledge to help the student do it (Bunch, 1997, p. 21).

In addition to physical and sensory processes, a mental concept is necessary for effective music performance, involving both verbal and nonverbal factors. Singers are often encouraged to feel or imagine sensations and teachers may stress different anatomical locations according to the tone quality required (Mason, 2000). As will be demonstrated later in this paper, gesture functions as an embodied mediator in the translation between these two components.

Qualitative data analysis methods were utilized to develop an understanding of the role of gestural cues, reflecting the importance of embodied cognition for integrating
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concepts of vocal pedagogy in music instruction. In the context of this investigation, gestural cues are those gestures made to initiate a response or change in behavior in a communicative interaction. It should be noted that these two gestural functions are often performed simultaneously in the same gesture. In this study, initial coding was related to a theoretical model of embodied music cognition. This research should provide information applicable to vocal pedagogy, as well as enhance the development of analysis tools for singing in an ecologically valid context. This may serve to reduce the introduction of confounding variables that might result from conducting research of communicative patterns outside their naturally occurring context.

Background

Studies in Gestural Communication

Engagement with music occurs to a great extent through bodily movement. Corporeal experiences play an active role in the formation of mental representations (Godøy & Leman, 2009). Musical gesture allows for participation in musical experience. Gesture is the method by which musicians control their instruments and coordinate their actions. Gestures representing music can be used to form gestural schemata, which are semantic networks with corresponding neural networks involving intermodal cognitive representations for multimodal interpretation (Lidov, 2006). These schemata are developed, adapted, and refined through practice and adaptation.

The work of David McNeill provides insight into the topic of gestural communication regarding the hand and its communicative movements as gestural idioms representative of thought in action. Within this context, the hand represents something other than itself and the resulting gestural articulations may be linked with a semantic and pragmatic context. For the purposes of this study, gesture is defined as movements of the hands and arms as people talk (McNeill, 2003). These gestures are considered to be symbols representing action, movement and space. According to this paradigm, gestures form an integral part of communication, of equal importance to words, phrases, and sentences. The gesture functions in combination with linguistic structures to form a comprehensive communicative system. Vocal instruction utilizes gesture to express images that cannot be expressed in speech. Speech and gesture must cooperate to express the person’s meaning (McNeill, 2003).

A qualitative study assessing the role of gestural communication in vocal pedagogy was undertaken by Nafisi (2010). Nafisi proposed that gesture facilitates vocal instruction through use of imagery and metaphor, which could be tied to the sensory process used to interpret vocal concepts:

Considering the possibilities of visualization through gesture in light of the evident connection between music and movement (Jacques-Dalcroze, 1921; Baney, 2002; Kendon, 2004)…this study grows from the notion that gesture might be a useful tool for communication of vocal and musical concepts and asks about the role of gesture.
alongside or in place of verbal metaphors, imagery and scientific explanations in the communication of sensory experiences that is singing (Nafisi, 2010, p. 6).

The two primary gestural categories that were identified by Nafisi (2010) for vocal pedagogy were musical and technical. The basis for this distinction was made between gestures that occur during the technical portion of the lesson and those that occurred during the musical portion of the lesson. Within the technical portion of the lesson two further subcategories were identified: physiological and sensation-related gestures. Classification according to pedagogical intent is a valid method of organization, but it does not account for the global intent of gesture. For example, a gesture may occur in both contexts during a lesson, but within the context of thematic coding the gesture would then need to be classified separately in two categories to be correctly identified. In addition, it is problematic to argue that technical gestures, especially where related to sensory process and proper tone production, are not musically related.

Within the context of research on increased communicative efficiency, Liao and Davidson (2007) studied the impact of gesture techniques on children’s singing. The role of direction and gesture were examined through structured interviews with five children. According to Liao, singers use their gestures to make kinesthetic imagery into a kind of picture for the process of developing musical memory, which improves singing ability. The direction of gesture seemed to have a link with tone quality, which Liao linked with the lifting of the soft palate and a more “smooth round sound” (p. 89). Expressive gestures were reported to create more expressive sounds and improved concentration. Within this context, practised gestures produced better results. Hand placement seemed to also affect note onset.

These findings were then elaborated through a study of 80 kindergarten children in which pitch accuracy in children’s singing was studied (Liao, 2008). Children tended to sing more accurately, in terms of pitch, when tonal patterns were paired with an accompanying gesture. In addition, when a gesture was used, girls demonstrated a higher level of accuracy than boys. It was proposed that these results might have been a reflection of not only a more positive response to the tasks, but also that gesture design might have an impact on pitch accuracy. The study of gestures and the communicative patterns used in effective vocal instruction is, therefore, a potentially fruitful area of study. A theoretical foundation in the area of embodied music cognition (Leman, 2008) may therefore be useful for understanding signification practices. Embodied music cognition is a valuable lens through which to view research as it involves nonlinguistic descriptors in order to understand different levels of awareness and different perspectives on observation and signification. In the context of the current study, gesture functions to mediate and provide access to subjective sensory processes through action-based approaches to musical comprehension. Interaction can be observed in sequences of actions involving responses based on emotive, affective, and expressive competencies. When actions are sequenced or chained their meaning and intentions are interrelated and influence their meaning. From this perspective vocal performance is an ideal way of studying such interaction since the vocal instrument, part of the body, is viewed as the mediator in musical communication and the action-reaction cycle.
King and Ginsborg (2011) conducted a study of interactions between singers and pianists during ensemble rehearsal involving a detailed analysis of eight performers’ visual and gestural communication. They coded gestures according to type, function, and effect. Most often gestures were coded as states (involving actions with duration) or points (actions with no specific duration). Overall, performers were found to use physiological gestures to a greater extent when rehearsing with a partner whose level of expertise matched their own. Gestures were used for self-reassurance and guidance during rehearsal, for example to ‘pulse’ along with the beat. Performers were found to produce some consistent gestural patterns in their physical realization of the songs, thus indicating the development of internal (mental) representations. King and Ginsborg (2011) describe the complex cognitive processes at work in ensemble performance, particularly as each performer becomes familiar with a song and the other’s physiological realization of it. They must anticipate and attend to their partner as well as adapt to their own performance, which includes both motor imagery and auditory information.

These studies were used to develop an informed initial coding structure for use in the present research. Their findings also demonstrate the crucial importance of gesture and embodied interaction in music communication.

**Theoretical Paradigm**

![Figure 1. Model of Embodied Musical Communication.](image)

In the context of embodied music cognition, gesture functions as the external mediator (Leman, 2008) of internal sensory and cognitive processes. This model of musical communication is depicted in Figure 1 (above). The model represents the multimodal information (both sonic and visual) transferred between musical participants allowing for embodied attunement and entrainment. Within this model,
action and perception are closely linked, as the sensory information provided by each participant results in an exchange of musical information. Furthermore, social interaction in a musical context can often lead to corporeal imitation and emergent behavior (de Bruyn, 2012; Neda et al., 2000).

**Extended model of embodied musical communication**

The original model of musical communication shown above was extended in the present study in order to provide a framework integrating the specific aspects of nonverbal communication that were observed in the voice lessons. This strategy allowed for other theoretical paradigms, specifically those of joint action and body schema, to be integrated practically within the framework. This adapted theoretical model is presented in Figure 2 below.

![Figure 2. Model of the role of embodied communication in accompanied vocal performance. Participants express their individual intentions and musical goals through an embodied framework. The area of intentional matching represents embodied attunement between participants.](image)

The model depicted represents the nonverbal interaction between two participants during musical communication. Each participant exchanges multimodal information with the other according to the original embodied model. Furthermore, gestural mediation allows for the communication of complex messages (integrating multimodal and multidirectional information) to be sent and received simultaneously and continuously. These processes may serve to enhance the efficiency of communication. For example, a student’s refinement of musical concepts and
technical precision may be facilitated through gestural imitation and replication (as will be demonstrated practically later in this paper). Through gestural imitation and communication participants may develop enhanced intentional matching, as represented by the intersecting area of the diagram. As gestures are repeated, imitated, and/or chained they may allow for better comprehension between participants and increase progress towards an educational/musical goal. This phenomenon can be grounded in the theoretical paradigms of body schema and joint action. These theories are helpful, as they provide concrete evidence and application for the link between interpersonal gestural communication and embodied cognition in music perception.

**Practical applications**

As illustrated in Figure 2, gesture is a tool that allows for the dynamic integration of simple sensorimotor mechanisms and joint intentionality in a hierarchical network between participants. Gestures allow for the formation of common codes and simulation mechanisms in the course of the lesson. These are used to plan and predict one’s own actions, as well as predict the actions of others in parallel and in relation to jointly intended outcomes (Knöblich & Sebanz, 2008). Therefore, the individual’s extension of their action-oriented repertoire results in a corresponding understanding of their partner’s actions, and shared understanding through action-simulation mechanisms.

Within this context gesture represents an extension of the body schema. As described above, gesture serves to extend the instrument of the singer to communicate expressive musical intentions or technical concepts (Nafisi, 2010) to other musicians. This extension of the body schema may serve to train the body to react in new ways to novel stimuli and should therefore, represent an extension of action repertoire. The perception of the body is extended to form a feedback cycle involving visual, auditory and proprioceptive information (Welch, 1985). This process is shown in Figure 2 in the smaller circular areas representing improved efficiency in performance practice.

Within the motor response schema there are several phases (Schmidt, 1975) including:

1) initial conditions;
2) response specifications for the motor programme;
3) sensory consequences of the response produced;
4) the outcome of the movement.

Within the context of cognitive sequencing of vocal pitched imitative response to auditory signal, Welch (1985) states:

The desired outcome and initial conditions are fed into the schema. The response specifications for the voice programme are then decided on, being based on the relationship between previous response specifications and past outcomes. At the same time the schema generates the expected sensory consequences of the response, i.e. the expected proprioceptive and exteroceptive feedback (Welch, 1985, p.249).
These responses then result in schema feedback in response to subjective reinforcement and perceived outcomes.

Interpersonal processes are therefore necessary to support the intention to engage in joint action, learning, and communication (Knöblich & Sebanz, 2008). In the context of the voice lesson, interpersonal communication processes involve joint action in relation to gesture performed both by teacher and student to reflect goals for vocal and musical production, including the improvement of vocal technique and musicianship skills. Both teacher and student continually seek to enhance performance and predict performance outcomes. Gesture functions as a representation of common codes in movement, where action is implemented with the goal of creating resonance with the observer’s motor system.

These mechanisms can be used not only to derive action goals during or after observing actions, but can also be used to predict outcomes of actions as they unfold. In a nutshell, the assumption is that when one observes others’ actions, one can project intentional relations guiding one’s own object- or person-directed action onto observed actions (Knöblich & Sebanz, p. 2024).

Each individual’s gesture serves to demonstrate internal cognitive process to the other participant. Gesture thereby functions as a reflection of mental states, interpersonal understanding, and interpersonal interaction with intention as a central construct. The goal is to increase the direction-perception match as efficiently as possible.

Behaviorally, the close link between perception and action manifests itself in facilitation and interference effects, where it is easier to perform the same actions one is concurrently observing (Knöblich and Sebanz, p. 2024).

These simulation mechanisms involve mutual attention to a shared musical goal requiring the formation of intentional structures. As discussed later in this paper, these result from gesture replication, which are then adapted into dynamic gestural changing during a voice lesson. This allows for continual nonverbal interaction underlying the whole voice lesson to achieve an intended outcome. It is important to note that these theories were only applied to the original model of musical communication as a result of the data collected as part of a qualitative study during the voice lesson. Nevertheless a rich and detailed framework integrating practical theories of musical communication and cognition emerged.

Method

Participants

Data were collected from three teachers (one male, two female) of classical voice at the Ghent Conservatory. All the teachers had more than ten years of teaching experience. Data was collected from six students each of whom had three lessons, one with each of the teachers, as a normal part of their studies.
Materials and Equipment

Lessons were video-recorded using a Canon Legra HD camera. ELAN Annotation Software was used to process the video material and organize coding (Lausberg & Sloetjes, 2009). This software allowed for multitier video annotation. Tiers can be hierarchically interconnected and aligned in time with multimedia files.

Procedure

Questionnaires were used to obtain information regarding participants’ prior reflections on the use of gesture in instruction. Teachers were viewed in this context as ‘experts’ and discourse analysis was undertaken in order to verify that the researchers’ understanding of the communicative context and intentions was correct. Teachers and students were informed of the broad purpose of the study. Approval was granted for conducting the study. All participants agreed to participate before any data was collected and reviewed all materials involving personal data submitted for publication. Data collection took place in the normal classroom environment. Video material was then examined utilizing the qualitative research framework outlined below.

Multilevel Thematic Coding

Thematic analysis took place at multiple levels. At the first level of coding, general initial codes were developed as described below; at the second level searching for and reviewing of themes took place (Braun & Clarke, 2006).

At the first level of coding types of gestures were coded and clustered based on similarity of meaning (Madill & Gough, 2008). Coding was largely descriptive and based on the pre-recorded video material, and the gestures utilized during vocal instruction were analyzed thematically. Four categories of gestures were determined, based broadly on the work of Goldin-Meadow (2003). After the gestures had been coded, based on overarching types, they were linked to the vocal concept with which they were associated. Meaning was coded based on the task at hand. Speech and other aspects of the context of communication were examined to provide a framework for gesture. The relationship between how the speaker and listener mutually interpreted each other’s gestures and the roles that they play in cognition and understanding the vocal concepts were studied and coded. This was accomplished by evaluating the gestural communicative patterns and their reinterpretation by the student both verbally and nonverbally. Also included in this stage of coding was the classification of the gestures based on the work of Ekman and Friesen (1978), as described by Davidson (2005). Within this study, performance gestures could be classified into five categories:

**Emblematic:** Representative gestures used to communicate ideas associated with words or actions, such as a peace sign or salute;

**Illustrators:** Actions that emphasize the story or music, such as making a rocking gesture when talking about putting a baby to sleep;

**Adaptors:** Often unconscious actions, such scratching or rubbing the chin;
Regulators: Gestures used for coordination and regulation between performers, such as cueing entries;
Display: Gestures not directly linked to information in the score but concerned with “showing off” to the audience.

This was helpful as an initial basis for classification and potentially facilitated overall pattern recognition for application in future research.

Results

Analysis of gestural patterns in voice lessons provided information on application of gestural interactions in vocal instruction.

Instructors’ perspective and evaluation

Instructor’s reports displayed several themes regarding the importance of gesture for both vocal pedagogy and performance. There was a perceived difference between performance and instructional gestures.

For example, in performance the body was used as a whole body while in lessons the gestures functioned individually, decontextualized from more holistic action:

In performance, I think the feeling in whole body (happiness, despair, hope …) is more important than the gesture itself. For example the evolution of a character is translated musically, in the voice, AND in the body…”

Gesture served a communicative function:

During the lessons, I think I use gesture more for the technical aspects than for the musical ones.

Gesture was also reported to facilitate interaction between student and teacher in elucidating new concepts:

Also if you don’t know the student for long time, expressive face and body can be enough to let them understand what you mean. But it’s also important to show sometimes with the voice what technically good is or less good.

Therefore, gesture was perceived not only to explain, but also to evaluate, and allowed for continuous nonverbal feedback. Gesture assisted as an anticipatory nonverbal communicative tool that enabled better coordination of the physical coordination and sensory processes involved in efficient tone production:

I have sometimes the idea that some students know in advance what I will say to them (only to look at me when they are singing, or if they don’t feel with their body what my gesture shows to them).

Sensory information could be more easily communicated, enhancing student comprehension:

I always ask if they “feel” what I mean… because I can’t
Teacher expertise assisted in the definition of the role of gesture in vocal instruction. It was therefore necessary to integrate specific gestures regarding sensory and physiological information not only in the coding system but also in the context of communicative and intentional goals shared by teacher and instructor.

**Initial Thematic Coding**

Initial coding involved classification according to previously established coding methods. However, from the perspective of embodied music cognition, it was more interesting to examine the formation of complex nonverbal communicative patterns in vocal instruction than the functions of individual gestures.

**Extended mediation: Representation and demonstration of vocal concepts**

Data from this preliminary analysis was useful in the drawing of some initial conclusions when examining the gesture and gestural patterns used in vocal pedagogy. A global synthetic image can take form in the pairing between gesture and vocal concept at the moment of preparation, as the phase begins, even when there is not yet a linguistic structure with which it can be integrated. Preliminary data provide support for the use of the pragmatic synchrony rule, which states that if gestures and speech co-occur they perform the same pragmatic functions (see Figure 2). Therefore, we can accept that in most cases the vocal concept that the instructor is describing is reflected in the gesture used or immediately preceding speech. This gestural imagery functions as an external demonstration of a vocal concept. Gesture is used as a tool through which the inner cognitive processes are translated into external form. For example, as demonstrated in Figure 3, the teacher uses his hands to demonstrate the changes of the vocal tract and resonance space that could not be demonstrated externally to the student:

…the thing is, as you move through the passage you need to be slim.

**Figure 3.** Instructor demonstrates changes in vocal tract spatialization through gesture.

When combined with verbal information and performed demonstration, the use of gesture provides the student with a concrete demonstration of the teacher’s intention.
and internal physiological processes. Vocal instruction utilizes gesture to express images that cannot be expressed in speech. Within this context speech and gesture must cooperate to express the person’s meaning. These representative gestures were coded as iconic gestures, which were representative of body movements, the movement of the individual in space, or the objects or individual movement desired. They may be improvised, but they are nevertheless grounded in concrete concepts of vocal pedagogy and reflect musical and technical features.

One reason for concluding that gesture is an embodied, instrumental mediator is that teachers of voice exhibit communicative patterns atypical to other communicative contexts. In the context of vocal instruction, highly exaggerated gesture is used to represent internal physiological processes (see Figure 4).

![Image](image_url)

**Figure 4.** Gesture and extended mediation as an instructional tool in vocal pedagogy.

While replication is expected, the student is not expected to repeat the gesture to the same exaggerated level. The theory of embodied music cognition could provide an explanation within the context of mediation. The singing teacher must rely on his or her body as an extended instrumental mediator. Through it, an action-related ontology can be developed, which forms a foundation for mirrored intention between the student and teacher.

**Enhanced efficiency of communication**

1. Mutual Intentionality

Gestural patterns associated with increased efficiency of communication were observed. Gesture was used to elucidate the initial presentation of the vocal concept presented by the instructor. The gesture might then have reappeared during the course of the lesson, with or without linguistic support, to remind the student of the initial concept. Finally, the student would then utilize the gesture him- or herself when applying the new technique, thus facilitating the implementation and application of embodied understanding. Demonstration of a vocal concept as a representation of a technical concept did not always require a verbal reference. After its initial presentation the student then replicated the gesture, exhibiting both exploration of the technical concept and comprehension of the concept being conveyed (Figure 5).
Nonverbal referencing could occur continuously throughout the lesson, thus revealing the relationship between mutual interpretation and gestural communication.

Multiple gestures representing different goals were then combined to form a complex nonverbal interchange between student and teacher where the initial idea presented could be enhanced with added information (see Figure 6).
Figure 6 illustrates a chain of gestural, nonverbal interaction that took place over approximately 15 seconds during one lesson. Such chains potentially allow for increased efficiency of communication, as the teacher can modify the student’s performance while singing and may permit the student to develop mastery of the technical concept more quickly, especially as communication and referencing occur while singing. Gestural chaining uses multidirectional or multilevel gestural information to combine and coordinate two or more technical concepts. This communicative strategy also allows for refinement of performance and facilitates interaction, as the student is provided with continuous evaluation on their performance and can concurrently convey information to the instructor about their own thoughts and sensory processes while singing. Gestures may be adapted as each gesture becomes integrated into the individual’s communicative interaction. As gestures are adapted to individual comprehension qualitative research can be used to evaluate the processes involved in intentional matching and the action reaction cycle.

**Spatialization and Directionality**

As shown by Liao (2008), direction plays an important role in gestural communication in the context of vocal studies. Multidirectionality may have an impact on the coordination of the complex physiological processes required for efficient vocal production, as illustrated in Figure 7. In this photograph, the student can be seen to coordinate both diaphragmatic support and the lifting of the soft palate simultaneously.
Secondary Thematic Coding

The second level of coding provided more general information on communicative patterns. Illustrators (see Figure 1) were the most prevalent gesture, representing technical concepts. Emblematic gestures were also used, primarily as reinforcement for positive changes in technique (Figure 8).

Adaptors, when used at all, conveyed non-technical concepts. Conversely, regulators were most frequently used in a technical musical context such as cueing entries and beating time. Display gestures were observed during the musical portion of the lessons, but were often a translation of technical gestures that had been made earlier in the lesson.
Implications

Neither the communicative process underlying music instruction in general nor the concepts underlying effective vocal instruction in particular can be fully understood unless the non-verbal communication that underlies instructional discourse, including gesture, is also considered. It is particularly important that the understanding of communicative intent in music and music instruction should be global, rather than segmented or linear, and the framework presented in this paper is useful for this purpose. However, there are certain limitations to our understanding of gesture in communication. One gesture may contain multiple meanings. For example, an iconic gesture represents something other than itself, by definition. Other challenges include the interpretation of pauses, multiple gestures and/or gestures that correspond to more than one unit of information. These limitations are somewhat mitigated by the use of multiple methods of data analysis as triangulation to check that interpretations were both coherent and internally consistent, and to ensure the reliability of the conclusions drawn (Stiles, 1993). The researcher therefore carried out interviews with instructors once the observational data had been analysed to confirm that the meanings of gestures had been identified and/or interpreted correctly. Further limitations cannot be avoided, however, as the data obtained in the study exclude all previous gestural interactions. In addition, gestural replications are not always immediate and may be slightly adapted by the individual.

Conclusions

Gesture and bodily movement play an important role in vocal pedagogy. Gesture serves multiple functions in relation to ongoing communication in a singing lesson, for example as a learning tool in the communication of sensory, technical and musical concepts (Nafisi, 2008, 2010). Teachers of singing rely on these functions to illustrate and explain their ideas. Gestural communication is an instructional tool easily adaptable to the needs of the student. This tool has several advantages as it allows individuals to communicate information externally regarding internal sensory and physical processes involved in singing. The teacher represents desired goals in relation to vocal technique, while the student can (often simultaneously) communicate information about their own sensory and intentional experiences. Gestural interaction allows both participants in the voice lesson to interact nonverbally while actively engaged in singing. Gestural chaining can provide varied and complex messages regarding the ongoing internal processes and intentions of the teacher and student. Gesture is, therefore, a powerful evaluation tool in responsive, dynamic teaching.

The authors of this paper used the theoretical paradigm of embodied music cognition to explain gestural communication in vocal pedagogy as shown in the initial behavioral patterns produced in the course of lessons. Teachers and students alike demonstrated increased embodied attunement through joint action. Intentional matching was exhibited by the replication of gestural information. Students were encouraged by the teachers to extend their body schemata. Specifically, they learned
to use their body in new ways, perhaps beyond that which they could accomplish by themselves. They became aware of negative habits and moved towards alternative physiological patterns by replicating and embodying gestural communication. Therefore, gesture serves to extend verbal description and thereby enrich instruction.

Gestural communication in vocal instruction provides the basis for complex interpersonal interactions, reflecting ongoing tactile and sensory processes. Gestures provide more efficient representations than verbal description and communication alone. In addition, gestural interaction with the student provides critical information to the teacher and allows for continuous interaction reflecting internal cognitive processes and understanding. Gestural adaptation and elaboration facilitate the refinement of technical and musical concepts and are often a tool to link interrelated concepts during a voice lesson. Through replication gestures become integrated into the student’s communicative interaction. Therefore, gestures become slightly adapted to individual comprehension and representations. Linguistic descriptors should, therefore, be supplemented by gestural information in this context to enhance the efficiency of communication. Gestural chaining becomes the basis for complex communicative exchange between teacher and student. Multilevel coding helped to identify the processes involved in the development of mutual understanding of embodied intentions and also the gestural conventions formed from this coded transmission system.

References


**Biographies**

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