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# Embodied Communication Practices in Instructive Interaction between Musicians

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## Abstract

Musicians, in the discussion and teaching of their art, commonly make use of vocalizations in order to demonstrate a particular melody or musical phrase. In the present study, we consider the use of these vocalizations as part of embodied depictions, and the role that these embodied communication practices play in music instruction. Data drawn from video recordings of private lessons between a clarinetist and his instructor demonstrate that these enactments are used in order to (re-)represent the experience of both performing and listening. The music instructor makes use of these embodied depictions for a number of actions central to teaching the art, including assessment, direction, and displays of understanding. In considering body-based communicative practices as an instructive tool, we consider both simulation and social action based cognitive perspectives through application in the analysis of goal-oriented interaction.

**Keywords:** Instruction; Embodied Cognition; Non-lexical Speech; Social Actions; Gesture; Body; Music Education.

## Introduction

For musicians, the ability to talk to each other about what is essentially a non-linguistic domain (music) plays a vital role in the teaching, rehearsing, and performing of their art. The requirements of the structured activity of music instruction motivate the musicians to make frequent use of ‘nonsense’ syllables during interaction; for example ‘*it sounds really effective, but it sounds a little bit urrrllliiaa*’. These non-lexical vocalizations appear to be a crucial and commonly used resource, for both teacher and student, in music instruction, despite the large and well-established technical vocabulary available. From a traditional linguistic view, these vocalizations are semantically null, and cannot be used as arbitrary and conventional referencing symbols (Goodwin, Goodwin & Olsher 2002). Yet in the situated activity of the music lesson, much of the instruction is achieved through their use. How is this accomplished? Understood within a framework of embodied cognition, which emphasizes the role of modal representations (Barsalou 2008), these ‘nonsense’ syllables become much more; they represent a means of sharing direct perceptual experience, providing the participants of the interaction the ability to make use of the mental machinery involved in perception and simulation for the purposes of learning and development.

The purpose of the current paper is to demonstrate that the interactive goals of the lesson, namely the teaching and learning of music performance, are achieved by and motivate the use of these embodied vocalizations as perceptually parallel direct experiences of the music under discussion. Combined with gestures, body movements,

prosodic contours, and interaction with the physical environment, the nonsensical speech sounds depict the music under discussion. By taking the framework of embodied cognition, through which behavior is understood in relation to the perception- and action-based systems of the body (Barsalou, 2003; Barsalou, 2008), the vocalizations can be understood as a means of grounding the interactive goals of the lesson in direct experience.

## Embodied Cognition and Instruction

Theories of embodied cognition, which have been invoked in a wide range of fields, focus on the explaining cognitive phenomena through an understanding of agent-environment dynamics. In contrast to cognitivist and computational paradigms, embodied cognition replaces the study of amodal symbolic representation and processing with the study of mental simulations and situated action as the basis of cognition. They provide an especially appropriate foundation for the study of the instruction and education of a non-verbal art such as music. In many types of instructional settings, body-based communication techniques anchor complex ideas and increase comprehension (Iverson & Goldin-Meadow, 1998; Goldin-Meadow, Kim, & Singer, 1999). For a paradigm in which cognition is situated socially and cognitive work is off-loaded onto the environment (Wilson, 2002), the use of multimodal communication practices in an educational setting aides in establishing appropriate learning and problem-solving behaviors (Nathan, 2008). For example, both children who are instructed to manipulate physical objects while reading mathematical story problems, and those instructed to imagine the manipulation have higher gains in problem solving ability than their non-imagining counterparts (Glenberg, Jaworski, Rischal, & Levin, 2007).

The paradigm of embodied cognition has been applied successfully to the study of body-based and situated mathematics education (see e.g. Lakoff & Nuñez, 1997; Nuñez, Edwards, & Matos, 1999). These researchers have focused on the embodied conceptual system from which mathematical reasoning arises, as well as the role played by the situated social contexts in which learning occur. These studies demonstrate that difficult concepts in a domain such as mathematics can be explained, in a manner beneficial to improving curriculum, through an understanding of the relationship between our perceptual experiences and our conceptual structures.

Similar to math education, an instructive setting such as a music lesson provides researchers interested in grounded cognition theories a naturalistic source of data through which to study both embodied communicative practices and

the social actions achieved through their use. Music performance requires a number of physical, sequential, and emotive skills, the learning of which takes place over many years of instruction. The ethnographic study of music instruction offers a window into the role features of embodied cognition play in the development of non-verbal skills in the interaction between student and mentor.

## **Music and Language**

In the data collected for the present study, the musicians are clarinetists. For a clarinet, sound is produced by the vibration of a wooden reed fitted to the underside of the mouthpiece. In order to produce this vibration on the clarinet, the clarinetist forces air through the instrument with their breath in a manner that mirrors the production of speech. In a manner also similar to speech, the tongue is used in order to stop the vibration of the reed and thus produce gaps of various sizes between notes. By changing the way in which the tongue touches the reed, thereby stilling it, different styles and strengths of separation between notes can be achieved. The use of vocalizations in the embodied depictions can be viewed, then, as mimicking the sensations of performing on the clarinet, from the exhalation of air from the lungs to the use of the tongue at various locations and with various pressures throughout the mouth.

Recent research has also demonstrated that the online processing of music and language overlaps (Patel, 2008; Fedorenko, Patel, Casasanto, Winawer, & Gibson, 2009), indicating that listening to a vocalized depiction of music may be a more similar experience to directly listening to instrumental music than has been previously thought. This would allow for the musicians to substitute the direct experience of music played on the clarinet with the non-lexical speech sounds of the vocalizations.

### **Vocalizations as Overt Simulation**

Previous work on non-conventional, non-lexical speech sounds has focused almost exclusively in two arenas: non-linguistic quotes and the use of non-lexical speech sounds by aphasics. Goodwin et al (2002) demonstrated how an aphasic man was able to utilize nonsense syllables in order to communicate effectively with those around him. Similar work on the use of non-lexical vocalizations as a communicative tool for agrammatic aphasics has been done by Wilkinson and colleagues (2010), who showed that the use of embodied enactment is an effective interactional means to achieve social actions with limited lexical and grammatical resources. Non-linguistic quotations, on the other hand, (“the car went *vrrrm*”), are typically described in particular syntactic constructions in the literature (Hudson, 1985), commonly as non-linguistic demonstrations in which the speaker depicts, rather than describes, their referents (Clark & Gerrig, 1990).

Given the similarities between both experiencing and performing music and experiencing and performing speech sounds, it becomes possible for the musicians to take

advantage of this similarity for the rehearsal of their art. Indeed, many music teachers will recommend mental rehearsal through making use of any opportunity, such as a walk across campus, to mentally play through a piece. Research into the role of simulation and imagined actions in the planning and execution of actions, such as playing an instrument, has flourished within the last 20 years (Jeannerod, 2001; Barsalou 2010). These studies demonstrate that the covert rehearsal of actions takes on many of the same characteristics as overt action, including temporal characteristics key to music production and experience (Decety, Jeannerod, & Prablanc, 1989). Drawing on the cognitive processes involved in simulation of the voice and music perception can also increase memory of rhythmic patterns (Pich 2000).

The enactments considered below can be described as overt, shared simulation; simulation with an interactional purpose. The overlapping cognitive substrate activated for both the perception and mental imagery of speech sounds and music provides the means by which embodied depictions of music may be substituted for the direct experience, to the benefit of the goals of the situated activity.

### **Vocalizations as Social Actions**

In many activities where the focus of the interaction is a non-verbal domain, the use of embodied communication is invaluable. Particularly in an instructive environment, the embodied actions considered here play an integral role in the development of expertise (Lave & Wenger, 1991; Firth & Wagner, 2007; Melander & Sahlstrom, 2009). By analyzing how it is that the vocalizations are used to achieve the specific interactional goals of the music lesson, namely the development of the abilities of the student, we provide strong motivation for including the study of embodied communicative practices, as part of the study of education and instruction. In the data collected for this study three distinction actions were found that make use of the vocalizations; assessment, direction, and response. Most commonly, the embodied depictions are used as a means of conveying a critique of a previously experienced bit of music. The depictions are also frequently used as part of a directive, commanding the student to follow with a translation of the vocalization on his instrument. Lastly, the musicians use the vocalizations in response to a bit of talk in order to display an understanding of what has just been described.

### **Assessment**

Consider the non-lexical vocalization that occurs in the following transcript. In depicting the music played by the student, the instructor makes use of multimodal and embodied communication practices to highlight the quality he wishes to assess, emphasizing and exaggerating the particular feature in a way that allows the student to perceive the issue in the music as well. In this example, the depiction is quotative in that it indexes previously

performed music and gains its interactional meaning through this reference as part of the larger action of assessment and evaluation. Prior to the start of the transcript, the student has just finished performing a passage from Ned Rorem's *Poems by Sylvia Plath*, which ends with a run of short fast descending notes. The instructor, after giving a general positive assessment, highlights this run of notes and attempts to correct the way the student performs them. In the transcriptions, "I" is used to indicate lines spoken by the instructor, "S" for the student.

#### Transcript 1

- I: Now here  
**(points to sheet)**<sup>1</sup>  
 I: umm, make sure-  
 I: make sure that we hear  
 S: **(blows air through instrument)**  
 I: the fours. Right now it sounds really-  
 effective but it sounds a little bit  
 → *urrrlllliaa*, youknowwhatI'msaying  
 → **(Hand across)**  
 S: mm hmm

The instructor uses the speech sounds that make up the vocalization to depict the lack of clarity between the notes. Unlike almost all other vocalizations found in the data, in which the nonsense syllables typically consist of an open consonant-vowel structure, one syllable for each note, the instructor uses a combination of vowels and liquid consonants to emphasize the slurred nature of his student's performance. This choice in speech sounds allows for an embodied experience of the indistinct quality that the instructor observed, and indeed the vocalization is the only source of the negative assessment in the interaction. The transition from the high vowels of [u] and [i] to the low vowel [a] can also be seen to mirror the downward motion of jaw required for the move from the high to low register of the clarinet. The manipulation of the voice, in combining speech sounds into nonsense syllables of particular pitch, loudness, and tempo, is a key feature of the depiction.

The action achieved by the use of the non-lexical vocalization is strengthened by the simultaneous use of gesture. While the instructor is making the '*urrrlllliaa*' sound, he draws his hand across the space in front of him in a slowly downward moving motion before rotating his pinky finger upward in release (see figure 1). The smooth motion of the gesture mirrors the emphasized characteristic of the quotation, with both the vocal and spatial modalities working together to depict the nature of the music being critiqued (see also Bräm & Bräm 2004 for an analysis of gesture in music-oriented interactions). His whole body also takes part in the reenactment; while he maintains orientation towards the sheet music, his torso and shoulders sway and dip across to the left, following and emphasizing the motion

<sup>1</sup> **(Bold)** is used to represent physical actions co-occurring with the line directly preceding.

of his hands. Thus three different modalities - gesture, prosody, and speech - are being integrated in the embodied depiction.

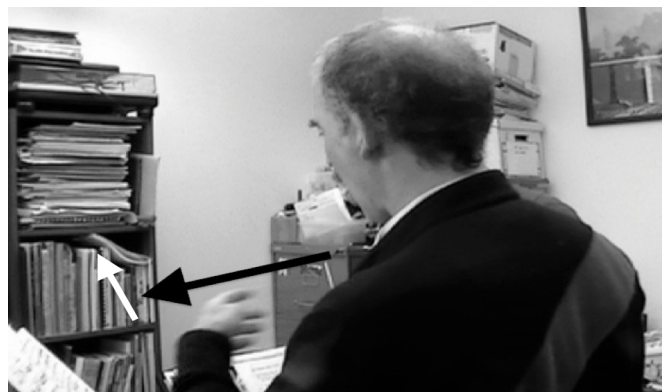


Figure 1: Gesture co-articulated with vocalization. The black arrow represents the first movement path, the white arrow the second.

The distinct features of the vocalization as used for assessment are a) the location within an instructive action sequence, wherein the student's previous performance is the subject matter, and b) its use as a quotative device to both pinpoint the trouble source in the previous performance and to simultaneously provide a critique. Importantly the embodied depiction itself is the only spoken negative critique, contrasted with '*very effective*' as part of an explanation of '*make sure we hear the fours*'. The role of the student in listening to such a depiction is to take on the role of the expert, re-experiencing his performance from a less direct standpoint that allows him to critically assess the facets of his performance emphasized by the instructor's quotation, which he may then affirm, as he does in the last line of the transcript.

#### Direction

Beyond assessment, the embodied depictions are used to directly change a future performance of a piece of music. Rather than indexing a previous experience, these directives specify exactly how a subsequent portion of music should be played. These directives may be used for a number of reasons during instruction, including taking apart a difficult passage at a slower speed for familiarization, practicing various facets of the technical skills, and prescribing changes to performances, as the following transcript demonstrates. Here, the instructor presents a hypothetical performance in his vocalization, one that does not necessarily index any previous experience. Rather, by making use of the depiction, the teacher offers the student an overt simulation of the music and in doing so requests a like performance by the student. The student may then draw on this perceptual experience as the basis of his own playing, which he does directly subsequently in translating what he experienced in the vocalized simulation into playing the clarinet.

### Transcript 2

- I: Just play the F, make a little  
bit of a diminuendo and then think  
→ baadaadaaDAA  
→ I: leading! yapupuuPAA  
(student inhales and then plays)

These directives are used for a number of purposes in the activity of the lesson. As in the example above, they are used to make specific changes to the performance style of the student. They may also be in forming a deeper understanding of the music through directing the student to play in an unfamiliar manner, such as playing a passage with a particular subdivision of the rhythm, or at a reduced tempo. Through presenting the student with a new perspective on the music through the vocalization, and directing the student to then mimic the vocalization with his instrument, the instructor develops both the student's perceptual and action-based understanding of the music.

### Response

Finally, a third social action makes use of the embodied depictions in the instructional setting between the musicians. These act as responsive displays of understanding, and so work to depict what has just previously been described by the co-participant. In transcript (3) below, the student is attempting to describe the rhythmic breakdown of a passage. The instructor responds by vocalizing the passage under discussion as his interpretation of the student's description. By embodying the music in this manner, the instructor displays his understanding of his student's talk in a way that allows the student to provide uptake, which he does positively directly after the depiction.

### Transcript 3

- S: So right now I'm thinking more of a six  
(pause)  
S: I'm um going to-  
I: yaadaadaadaadaadaadaa  
(pause)  
S: yea. diyadadadada  
I: So you're going for the C  
S: Um, I mean, yea I think I'm trying to

Here, the instructor's vocalization enacts his understanding of his student's explanation, allowing the student to experience the music directly and confirm that the instructor has indeed understood what was meant. That the student then double-checks the accuracy of this vocalized depiction by repeating it to himself demonstrates the role these vocalizations play as perceptual anchors for their understanding of the music.

## Conclusion

The means by which the musicians make use of cognitive parallels between the perception of their voices and the perception of music is not easily understood in terms of a semantics based on amodal and symbolic processing. Instead, applying an embodied perspective we have demonstrated that the role of simulation in perception and action may be exploited by the interactants for the purposes of the situated activity of instruction. An ethnographic study of the use of embodied communicative practices in education drives home the need for a larger investigation into the role that embodied information processing plays in the development of procedural and technical skills. In the music lesson, the instructor makes use of the perceptually grounded comprehension of auditory phenomena, such as music and the voice, in order to commit a large number of distinct social actions essential to developing musicality on the part of the student. This includes the quotation of previously shared experiences to simultaneously point out the trouble spot and provide a critique, depicting novel musical expressions to be translated from voice to instrument, and displaying understanding of some bit of talk. In contrast to previous studies that focus on the role of embodied experience to develop abstract concepts, these few examples demonstrate that the instructor is able to manipulate the perceptual-experiential systems of simulation *in situ* to rapidly and accurately share perspectives that will lead to the development of his student. Music is but one of many non-verbal domains in the arts and other technical skills in which the study of embodied communication practices could lead to the development of improved education.

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