Toward a Methodology of Vocal Pedagogy Research

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Introduction

This paper will consider the cultural artifact we call vocal pedagogy. While the word "pedagogy" often presents multiple meanings, here it will specifically refer to the interaction of expert teacher and novice student in a one-on-one studio lesson. The studio teacher's art has long been considered to be beyond the capabilities of empirical analysis. Yet, we instinctively are drawn to the Svengali-like powers of the studio teacher. We are fascinated by the use of language to compel behavior, to facilitate learning. The study of one-on-one voice teaching offers us the opportunity to observe at close hand how language mediates teaching and learning, and to begin to crack open the mysteries of the art of teaching.

While many young vocalists learn their technique and repertoire through informal means, the vocal studio represents decidedly more advanced study. It is an ideal context in which to study this process we call pedagogy. The music studio simultaneously shares the isolation and control of the laboratory while offering the natural environment of a real-world interactive context.

One possible method for exploring the world of the expert voice teacher is simply to ask, "What do you do and why do you do it?" Next time you run into a private music teacher in the hallway or at the grocery store, just ask these questions and see what answers you get. I expect you will hear, "I just know what to do, I can't explain why."

Herein lies our first problem: It's not that they are unwilling, but the experts who teach music simply are not able to share their secrets with us. We know that voice teachers have been successful for literally thousands of years. If they weren't, our cultural knowledge of singing would have disappeared long ago. To unlock the powerful mysteries of the music teaching studio – the mysteries responsible for all of us being here today — we will need a strategy other than direct questioning. We will need a strategy for conducting vocal pedagogy research.

This is actually two problems. Before we can employ a method to examine or observe vocal pedagogy, we need to know what we are looking for. This is first a problem of theory. Without a viable theory to explain the interactions between teacher and student, the flow of human experience from moment to moment in voice lessons is incomprehensible.

For decades, our observations of teaching have been dominated by the instructional theory of Behaviorism. To understand teaching, we looked for

examples of teacher stimuli and student responses. We looked especially for instances of teacher behaviors that reinforced successful student behaviors. The teacher's use of praise was crucial. When we found many instances of these teacher behaviors, we felt good about this theory. The key to good teaching was as simple the teacher's frequent positive reinforcement of successful student behaviors.

Unfortunately, when we actually look in on teacher-student interactions in music lessons, we find many, many interventions that cannot be explained just by the notion of reinforcement. Behaviorism has just not informed our professional practice the way we had hoped it would. It is time to consider a different instructional theory.

Scaffolding theory

Scaffolding theory emerged in the 1970's, inspired by the newly translated and accessible writings of Russian cognitive psychologist Lev Vygotsky. Scaffolding, of course, is a metaphor for how the teacher serves to support the student in interaction: *A scaffold is temporary. It is used to reach beyond your current capabilities. It is removed when no longer needed.* The work of Wood, Bruner and Ross in 1976 first articulated a set of scaffolding strategies.

Jerome Bruner and his colleagues identified six functional interactions they called scaffolding strategies. While Bruner described these scaffolding strategies,

Recruitment	Setting the task, synchronize attention/action: *Let's start at measure 12.*
Mark a feature	Highlight one aspect of the task or its performance; often seen as knowledge of results: *Short, softer, legato!*
Demonstration	Offers a teacher-generated model of the task's perform ance-may be positive or negative model. This model may be in the same instrument, or an alternate me dium.
Task manipulation	Modify some dimension of the task to manipulate its difficulty for the student, i.e. make it easier, or harder: *Clap the rhythm for me.*
Frustration control	Encourage student to stay on task, continue engage ment, persist on task: *I know this is hard, you're doing fine.*
Goal setting	Easily recognized by its future orientation: *Work on this Etude for next week.*

Figure 1

in general, the following definitions reflect these strategies as observed in the specific context of music instruction (Kennell, 1997):

Scaffolding strategies

PRE-SCAFFOLDING	SCAFFOLDING
student talk - - - - - - - - - - - - - - - - - - ->	student talk
teacher talk (reinforcement)- - - - - - ->	Recruitment Mark features Task manipulation Frustration control Goal setting
student plays- - - - - - - - - - - - - - - - ->	student plays
teacher plays- - - - - - - - - - - - - - - - ->	Demonstration

Figure 2

While most observational research employs the obvious categories of student talk, teacher talk, student plays, and teacher plays, etc., scaffolding theory reveals that the category of "teacher talk" has multiple possible functions.

Enhanced functional observation categories

As student problems emerge in time, the teacher determines the nature of the problem, selects the appropriate scaffolding strategy, and generates a case-specific intervention— all in less than a split second! Think of our study of pedagogy as a visit to an art gallery. Every painting is unique. Yet each individual artist used a common pallet of colors. These basic colors are mixed by the artist to address specific challenges and opportunities.

In a similar fashion, a finite set of basic teaching strategies can thus spin off a seemingly infinite set of pedagogical interventions. Teachers appear to "improvise" instruction when actually they are following a highly automated set of basic pedagogical rules that employ a fixed set of pedagogical tools. The six scaffolding strategies are the music teacher's pedagogical toolbox.

So scaffolding theory gives us something to look for in observations of teacher-student interactions. It provides a theoretical lens for grouping teacher behaviors in applied music lessons into meaningful categories.

Experience sampling method

The second problem in studying voice teaching is methodological: How are we going to look at applied teaching? Here, a major problem is time. Typically, music lessons are weekly meetings that extend over long periods of time, even

years.

What will be our unit of analysis? The unit "*All lessons between one teacher and one student*" could take years just to videotape, and additional years to tabulate and analyze the data. At the other extreme, the unit of "*One lesson*" could miss important interactions in the very next lesson. You see the problem of methodology: If we try to study larger units of instruction, how can we do this efficiently?

Larson and Csikszentmihalyi faced a similar methodological challenge in their 1984 study of human experience. They wanted to understand what people do day-in and day-out. They faced the same methodological problem. Studying one person in great detail is an important strategy, but it does not allow generalization to a larger population. Larson and Csikszentmihalyi were also looking for an efficient way to study human behavior in time.

Their solution was a technique called the "Experience Sampling Method." This method employed an innovative technique to randomly sample human experience. They distributed telephone pagers to all the subjects in their study. During waking hours, a computer generated pager numbers at random intervals. When the pager beeped, the subject made an entry in her logbook. The data then consisted of the logbooks from all the subjects By randomly sampling moments, these researchers were able to generalize to all the "life" moments for the subjects in their study.

While the idea of telephone pagers interrupting applied music teachers at random moments has a certain sadistic appeal, the resulting interruption of the flow of the lesson would be clearly unacceptable. The notion of randomly sampling music teaching in a succession of lessons, however, is an idea that might help make the systematic observation of applied music lessons more efficient. Random sampling would allow smaller data sets to represent the larger universe of music teaching experience.

The next section of this report provides a description of an adaptation of the Experience Sampling Method to the study of interactions in voice lessons.

Experience sampling in vocal pedagogy

The evaluation of consisted of five steps:

1. Record lessons on video tape
2. Randomization process
3. Production of the sample tape
4. Data collection
5. Data analysis

Figure 3

"Experience sampling" methodology

A voice teacher and undergraduate student at a Midwestern American university volunteered to have their lessons videotaped for an entire semester. During spring semester, 1997, a Panasonic OmniMovie VHS Video Camera PV800

was positioned in the teaching studio so that the field of view captured the sights and sounds of typical interactions. Fourteen successive thirty-minute lessons were recorded.

The student was a female, an undergraduate sophomore majoring in music performance. The teacher was a male with over twenty-five years of experience in teaching voice. The success of this teacher's graduates in the professional music world suggests that this teacher was an above average university voice teacher.

A process was employed to randomly select some lesson segments from all possible recorded lesson segments. These selected segments thus represented the larger set of lesson segments. In consideration of time, details on the randomization process is included in Appendix A.

The lesson segments identified for inclusion in the sample were copied from the original lesson tapes onto a second video tape: The Sample Tape. These segments were copied in sequential order as identified in the randomization process. A video title maker was used to superimpose the appropriate random number over its matching twenty-second segment.

Each sample segment was introduced with a five second blank screen with the segment number superimposed, followed by the twenty-second video segment, also with the segment number superimposed. A ten second black screen was used to separate one lesson from the next.

The sample tape consisted of 137 twenty-second samples drawn from a total universe of 995 possible twenty-second lesson segments. The expected universe of 1260 lesson segments was not realized because nine lessons did not last the full thirty minutes including one lesson that was suspended due to student illness. The resulting sampling procedure produced a .95 confidence interval with a sampling error of plus or minus 7.7 percent (Sissons, 1993). This level of error was considered acceptable for this exploratory study.

The conversion of videotape action into data for analysis was completed using Robert Duke's SCRIBE software. "SCRIBE" stands for Simple Computer Recording Interface for Behavioral Evaluation and runs on the Apple Macintosh computer. This study utilized an Apple Powerbook C190 computer to run the SCRIBE software. SCRIBE offered two important opportunities for the researcher: SCRIBE allowed the creation of any number of customized categories for analysis. It allowed the researcher to code one set of observations, then in effect "rewind the tape" and independently record a second set of observations. It thus allowed multiple passes for the recording of data.

For this study, I defined SCRIBE buttons for two passes. The first pass measured the duration and frequency of these standard teacher-student behaviors:

Teacher Talk (T-TALK)
Student Plays(S-PLAY)
Teacher Talks OVER Student Plays (T>P)
Teacher Plays (T-PLAY)
Student Talks (S-PLAY)
Off Task (OFF TASK)

Figure 4 Observation categories: first pass

A second set of software buttons matched the six scaffolding strategies. These were recorded on a second viewing of the sample videotape:

Recruitment (REC)
Frustration Control (FC)
Mark Features (MARK)
Manipulation of Task (RDF)
Demonstration (DEM)
Goal Setting (DM)

Figure 5 Observation categories: second pass

Following the completion of data collection, the SCRIBE software produced three types of reports: A Summary of Observations, A Chronology of Events, and a Map of Events The following summaries were compiled from these reports:

	Duration Minutes	Duration Percent	Freq.	Ave. Duration.
Teacher Talk	19.8	39.3%	216	5.5 sec
Student Play	11.4	22.7%	88	7.7 sec
Off Task	6.9	13.8%	20	20.7 sec
Teacher Play	3.4	6.7%	59	3.4 sec
Student Talk	2.8	5.7%	83	2.0 sec
T-Talk > S-Play	.2	.3%	18	0.6 sec

Figure 6 Data summary: sample pass #1

	Freq.	Percent
Mark Feature	105	45.2%
Demonstration	82	35.3%
Manipulate Task	33	14.2%
Frustration Control	2	8.0%
Recruitment	7	3.0%
Goal Setting	3	1.2%

Figure 7 Data summary: sample pass #2

One voice lesson was selected at random several days after the original coding was completed. This lesson was coded a second time using the standard SCRIBE procedure to produce a measure of reliability. The SCRIBE program analyzed the two data files and produced these two comparisons using the interval of one second:

	Percent Agreement
Teacher Talk	86.6
T-Talk > S-Play	99.2
Student Plays	90.7
Teacher Plays	94.7
Student Talks	93.1
Off Task	100.0

Figure 8 Reliability: first pass

	Percent Agreement
Recruitment	99.6
Frustration Control	100.0
Mark Feature	98.0
Manipulate Task	98.0
Demonstration	98.4
Goal Setting	100.0

Figure 9 Reliability: second pass

Summary

When I first approached the voice teacher to ask if I might record his lessons, he was pleased that I wanted to see what special things he does as a teacher. The random sampling of his teaching must be a big disappointment for him! I'm sure I missed many, many special pedagogical moments: energizing stories, grand gestures and booming vocalizations.

But my research interest is not the unique or the special. I am interested in the normal. Like Larson and Csikszentmihalyi, I want to find out what the teacher does, usually and consistently. These are the basic mechanisms of cultural transmission. Did this voice teacher use scaffolding strategies? Which ones? How often? This exploratory study was another attempt at answering these basic questions.

And for answering these kinds of questions, the analysis of randomly sampled teaching segments is an appealing methodology. Primarily, it promises the advantage of efficiency.

The randomization process compressed the teaching experience of fourteen lessons into a more manageable 55 minute sample tape. Because the target lesson segments were randomly drawn, we were able to generalize our observations to the entire set of recorded lessons with a tolerable level of error.

The creation of a teaching sample from many weeks or months of teaching creates important baseline data on applied music teacher behavior. In time, we will have the opportunity to compare this baseline with another baseline of the

same teacher working with a different student. Later we can compare baselines of different teachers working in the same medium and compare different teachers of different instruments. One of the benefits of methodological efficiency is greater opportunity for replication.

Thanks to Robert Duke's SCRIBE software, this baseline data can be extremely detailed. Yet, SCRIBE is amazingly simple and easy to use. If we find interesting moments that deserve greater attention, we can still return to the original video tapes for further analysis. An initial quantitative approach does not preclude a companion qualitative study at some later date.

In closing, I would like to offer a brief personal speculation. Let's jump ahead many years. Let's pretend that several such studies of applied music teaching already have been completed. What if we should find that different applied teachers and teachers of different instruments all use the same basic repertoire of teaching strategies? What would this mean? These teachers surely didn't all study with the same music teacher! How did they come to teach in such a similar fashion?

And what if these same strategies were also found in other human teaching contexts, such as the training of bullfighters, ice skaters and other athletes? What would this mean?

Would we change our view of singing? Maybe singing isn't as special as we once thought? On the contrary, I think such hypothetical revelations would only serve to solidify the cultural artifact of singing along with humankind's other monumental achievements.

It may mean that at some time in the distant past of human history, we invented a means of effectively transmitting our knowledge from one generation to the next. At first, this cultural innovation of teaching insured our basic survival. We called this early instruction "parenting." But these successful strategies were gradually applied to other human activities as well. Culture was born.

Without the innovation of pedagogy — the innovation of successful teaching — learning would be limited to mere imitation, and the level of singing that we enjoy today would be impossible. Our ability to teach — our success with this new technology of cultural replication — is responsible for the expansion of all areas of human knowledge. It is responsible for all of humankind's higher achievements. And singing is certainly one of those! It is an important artifact of our cultural evolution, and we celebrate it here today in this marvelous conference.

Reference List

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Appendix

The randomization process

The randomization process consisted of the following:

(1) 14 lessons x 30 minutes = 420 minutes

(2) Each minute was divided into 3 segments of 20 seconds each: 420 x 3 = 1260 possible segments. Twenty second segments were selected as short enough to allow a focus of observer attention while long enough to capture several different teacher behaviors in each segment.

(3) A number chart was produced with fourteen columns (representing each lesson) and ninety rows (representing all twenty second segments in each lesson). The numbers were sequentially ordered from 1 to 1260.

(4) A random number generator selected 180 random numbers, these were highlighted on the number chart. Any duplicates were discarded.

(5) The final result was a lesson-by-lesson identification of target twenty second segments arranged chronologically. Since every three rows represented a minute of lesson time, each lesson segment selected for the sample could be easily identified.