Teaching Statement

My teaching has focused on linguistic phonetics and the interfaces between phonetics and the core areas of linguistic inquiry. I completely rebuilt both graduate phonetics courses, taught the undergraduate phonetics and phonology course and developed a new undergraduate phonetics course during my years at Cornell. I taught three graduate seminars, on the Acoustics of Voice Quality (Spring 2002), the Phonetics/Phonology Interface (with B. Moren, Spring 2003), and Speech sounds: their phonetic variability and phonological organization (with D. Zec, Fall 2006). I have taught Linguistic Field Methods (with C. Collins) on the Khoesan language Khoekhoe, and I have also taught Field Methods (with Franca Ferrari) on Kabyle Berber. At the University of British Columbia, I have taught a seminar on The Phonetics of African Languages, as well as an undergraduate course in Instrumental Phonetics, and a graduate course in Phonetic Theory.

My teaching philosophy emphasizes self-discovery. I encourage students to ask questions, and come up with their own answers. For assignments, I provide them with open-ended questions that allow each student to perform at their own level, while providing them with guidelines about the length of time I expect them to focus on each problem. If they are enthusiastic about digging into the entirety of the problem, I encourage them to outline the methodology they would use to undertake a full investigation of the problem. My students have identified very deep issues and provided concise, insightful statements about how they would go about solving the problems in a larger study if they had the opportunity to do so.

My ideas about grading are that grades are meant as a marker of how well the skills have been acquired. Since my goal is to have all students obtain the skills and knowledge I am imparting, I allow students to improve grades by revising their work. I think that students learn the most in this way, as they are able to fully master the skills. Since there are many paths to solving a problem, some of which are longer and more demanding, and some of which lead to dead ends that are not obvious at the outset, I give high marks for problem solving approaches that are sophisticated, recognizing that students learn problem-solving skills (even if their answer is not the received expected response). I encourage students to use innovative approaches and pursue new analyses of the data as long as they follow cogent reasoning techniques and sound methodology.

In the teaching of phonetics, there is always a trade-off between teaching the technical tools students need to master, and the theoretical principles that underscore phonetic reasoning and the interfaces between phonetics and other linguistic structures. In what follows, I outline the philosophies particular to specific courses, and discuss how I resolve this trade-off at different levels. In the lower level courses, I devote more time to analytic tools, while in the higher level courses, I focus more on the larger theoretical issues. However, I strive to keep a balance between both areas at all levels, so that students can gain skills in phonetic reasoning and acquire the necessary tools to undertake linguistic investigations.

Introduction to Linguistics

I have taught Introduction to Linguistics five times – three times as a Graduate Teaching Assistant at Ohio State University, and twice as a faculty member at Cornell University. The class sizes varied, with my classes at OSU being about 25 students, and those at Cornell, being about 75-80 students. For the Cornell classes, I had two TA's who taught several sections each of 10-15 students. I lectured on similar material in both the smaller and larger classes, and asked students questions
throughout the lectures, and had students come to the board to solve problems in both class types. Getting the students to discuss the material in class was the best way to make sure the material was understood by students of varying interests and varying levels of understanding. Assuring that the TA's and my own grading styles, and teaching styles were all consistent was probably the greatest challenge I faced in the larger class.

**Undergraduate Phonetics**

In the Fall of 2003, I developed a new undergraduate phonetics course at Cornell University, when the original combined undergraduate / graduate course was split into separate undergraduate and graduate courses. In the undergraduate course, the focus is on getting students to understand the basic elements of phonetics within the context of linguistics. I teach them the International Phonetic Alphabet, the articulatory principles around which it is built, and some of the basic acoustic landmarks found in categories of speech sounds (stops, fricatives, vowels, sonorants, prosodic contrasts). More importantly, I try to help students understand how physical constraints shape the realm of possible sounds and possible inventories, and how adaptable the human brain is at finding ways to produce impossible sounds through non-obvious articulatory mechanisms.

I teach basic acoustic principles, and have students do assignments using acoustic analysis software throughout the course of the semester. I focus the assignments by asking concrete questions, and by providing a canned set of data that illustrate the principles discussed in class. I intertwine such assignments with others that ask students to collect their own data from their own productions of English, or from their friends’ productions. I encourage discussion, and allow the discussion to lead to more general principles about phonetics, and build on their own observations. Students really enjoy seeing how their own speech is realized, and this personal aspect keeps them focused.

In the Spring of 2009, I taught an *Instrumental Phonetics* course at the University of British Columbia. At UBC, this is a second undergraduate course in phonetics, with the first part of the course sequence currently being focused on articulatory phonetics. In the second course in the sequence, I primarily focused on acoustic phonetics, and the interface between articulation and acoustics. I created new lab assignments for each type of sound recognized by the IPA. The students learned aspects of acoustic theory, focusing on Source Filter Theory, the Tube Model, and Quantal Theory. They learned how to segment words, how to measure formants, and determine place of articulation of stops using Locus Equations, how to measure place of articulation of fricatives using spectral moments, and how to measure place of articulation in nasals and laterals by looking at spectral zeroes. They learned how to measure phonation type of vowels by looking at acoustic voice quality, and phonation type of consonants by measuring Voice Onset Time. The students learned how to use *Praat* software for all of these tasks, and are now in the position to determined the place of articulation, manner of articulation, phonation type and airstream of any new sound they might come across.

**Graduate Introduction to Phonetics**

In my graduate Introduction to Phonetics course, I focus on introducing students to what I consider to be the major phonetic theories, such as Source-Filter Theory, Motor Theory, Quantal Theory and Perturbation Theory, the basic properties of the acoustics of different classes of speech...
sounds, and the different types of phonetic representations. I couch all of this within the context of prosodic control of articulation. I expose students to the advantages and disadvantages of different types of phonetic representations, such as International Phonetic Alphabet transcriptions, gestural representations found in Articulatory Phonology, and more complex multi-level representations in the C/D Model.

A secondary, but equally important goal of my graduate Introduction to Phonetics course is to equip students with the tools necessary for doing phonetic analysis: (a) knowledge of acoustic properties of different classes of speech sounds; (b) basic different types of acoustic analyses, and when to use each type; (c) intimate knowledge of an acoustic analysis package; and (d) the appropriate format for reporting experimental results.

It is often difficult to balance the teaching of more abstract phonetic theory, with the teaching of practical phonetic tools, particularly at this level, since both types of knowledge are crucial before students can move ahead with phonetics research, and the acquisition of appropriate tools speeds up their ability to undertake phonetics research immeasurably. I maintain a careful balance by requiring the students to use the tools to answer questions about how the data they are analyzing relate to theoretical questions. This balance is one that phoneticians encounter throughout their careers, as they strive to maintain sound methodological approaches, while focusing on interesting research questions. Thus, I think that keeping the proper balance within my classes is also important by way of example. Students need to learn to take both aspects seriously.

In the years I have taught Introduction to Phonetics, I have held a Phonetics Extravaganza, where I have invited faculty and graduate students to the lab for presentations. I have asked students to prepare poster presentations, powerpoint presentations, or just have well thought out what types of data they would like to show visitors, and have these data ready at their fingertips to show visitors interactively within an acoustic analysis package (typically Praat). I believe that this forum has allowed both undergraduate and graduate students to receive valuable feedback from faculty and advanced graduate students who know about the topics they have been studying, and to gain confidence in their own phonetic skills by being able to articulate their findings to more advanced students / faculty. I also believe that this practice has contributed to a positive atmosphere in the Cornell Phonetics Lab, and an environment where people feel free to provide constructive feedback to each other – an important quality for a research environment where collaborative work is common, such as experimental phonetics.

Graduate Advanced Phonetics

In my second graduate phonetics course, I focus on introducing seminal papers in phonetics. I try to balance classical papers that are timeless and crucial to understand the foundation of phonetics, with formative new papers that are having a major effect on the current scholarly scene. These papers lay the groundwork for finding topics in phonetics that they will pursue for their final course projects. These projects have formed the phonetic component of senior honors theses, and the basis of graduate A-papers. Although many of the papers focus on the phonetics-phonology interface given the closeness of the two fields, I also introduce issues in the syntax-phonetics and phonetics-semantics interface. I assign two homework assignments that gradually introduce students to the rigor of more demanding
quantitative phonetic studies, and introduce them to more complex phonetic tools, such as electro-
palatography, ultrasound imaging and airflow acquisition software. The students’ final projects use
some phonetic tool acquired in the phonetics courses to investigate a theoretical issue that they have
learned about through some of the literature that we have read (or that they have read in their other
courses) for their final projects.

In a second phonetics course, I encourage acquisition of advanced methodological tools for
doing phonetics research. I work closely with students while they develop their research paper topics. I
require students to hand in stages of their final papers throughout the semester, encouraging students to
get an early start on their research. I encourage students to meet with me to talk about their paper topics
before they hand them in, and afterwards for fine-tuning. I suggest references for them that I think
provide exciting directions for them to follow as they develop their papers. I help students develop
appropriate wordlists, set up quality recording protocols, choose appropriate measures, and develop
scripts for their analyses. Results thus far have been very successful, leading to two senior honor’s
theses and several publishable papers.

Linguistic Field Methods

In Fall 2004, I had the opportunity to teach Linguistic Field Methods on the Khoesan language
Khoekhoe with Chris Collins, and in Spring 2006, I taught Field Methods on Kabyle Berber. Both of
these classes were extremely enjoyable classes with undergraduate and graduate enrollment. The
undergraduate and graduate students interacted on equal footing. We used the opportunity to introduce
many of the students to phonetic fieldwork techniques. Early on, I developed detailed phonetic
assignments, where each pair of students described the basic acoustic properties of some aspect of the
language. Groups focused on the acoustics of click burst, nasal airflow in clicks, and comparison of
two types of aspiration. A fourth group focused on pitch patterns associated with different root tone
patterns. Throughout the semester, we undertook pitch tracking which was quite helpful for many of
the students’ projects, even those focusing on syntax since Khoisan languages display rich interactions
between phonetics and syntax. My involvement as a phonetician in field methods class helped students
to understand prosodic analysis of spoken language, a task that is poorly understood throughout the
field. The seminar has led to publishable papers for participants, and was the jumping off point for my
graduate student's dissertation on Khoekhoe (Brugman 2009). Four of our students presented analyses
on the phonetics of Khoekhoe at the 35th Annual Conference on African Linguistics at Harvard
University. From my perspective, this course allows the perfect balance of guided research. I have
taken three different field methods classes at three different universities as a student (UNH, UIUC,
OSU), but I felt that Chris' and my field methods course reached a level of cooperation and excitement
which is seldom seen.

During the Summer of 2009, I taught a Phonetic Field Methods course at the African
Linguistics School in Accra, Ghana. I was able to identify one of the graduate students who speaks
Lelemi, an under-documented Ghana Togo Mountain language. I was able to illustrate articulatory
phonetic techniques such as palatography, linguography, lip photography and ultrasound, as well as
basic acoustic analysis using Praat software. During the two week course, we determined that the
retroflexes documented by an earlier grammar only occur in loan-words from Ewe, but that there is a
dental / alveolar contrast among stop consonants in front vowel contrasts, which was previously undocumented. We also discovered that the velar part of the labial-velar consonants is farther back than the plain velars in the same vowel contexts. The course equipped the African graduate students with the tools to investigate the phonetics of African languages.

**Graduate Seminars**

I have taught three graduate seminars at Cornell, one on the acoustics of voice quality, one on the Phonetics and Phonology Interface, focusing on complex segments, and one focusing on phonetic cues to syllable structure. At UBC, I have taught a seminar on *The Phonetics of African Languages*. I organize my seminars around a central group of papers relevant to the topic at hand. In the seminar on voice quality, since the subject area was quite technical, I often gave lectures on the types of spectral analyses employed to investigate voice quality. In the phonetics-phonology interface seminar, I provided comments and discussion relevant to how phoneticians look at the questions under study. In both cases, I taught students how to understand the difficult acoustic concepts relevant to the papers, as well as how to understand the intricacies of acoustic modeling. I also pointed out relevant phonetic literature that supported or ruled out particular phonological analyses.

I learned a lot through the teaching of these graduate seminars, as explaining difficult concepts inevitably helps one learn them better. The collaborative aspect of the second seminar co-taught with Bruce Moren was exciting, and I also learned from the interplay between student reactions and the viewpoints espoused by the other professor. I think that the students learned a lot from the agreements and disagreements that we had during the course of the semester, and from that learned about what is controversial in the field, and what is acceptable even to researchers schooled in extremely different environments, with completely different sets of assumptions about sound structure.

I taught a graduate research seminar on the Phonetics of African languages at UBC. In this seminar, we read and discussed papers on the phonetics of syllabic consonants, tongue root in vowels, complex segments including labial-velars and clicks, contour segments such as prenasalized stops and airstream contour segments, ejectives, implosives, phonation, tone and intonation. The overall organization, and perspective of the course, derived from my reorganization of the IPA consonant chart found in my paper entitled *Differences in Airstream and Posterior Place of Articulation among N\uu Clicks*. The paper introduces airstream as a new level of contrast, distinct from phonation type. This distinction has large implications for clicks, labial-velars, ejectives, and implosives, as well as for phonation type contrasts found in African languages.

**Undergraduate Student Research Supervision**

I have worked extensively with undergraduate students, as I have employed a large number of students doing research under the auspices of my National Science Foundation grants. At Cornell University, I employed and supervised about ten students, who worked with me in various capacities. These students segmented and labeling acoustic data, segmented and classified EPG data, coded lexical databases and made spectrograms and pitch tracks. I enjoyed working with these students, illustrating appropriate techniques, checking their work, and helping them perfect their skills. I spend time discussing the hypothesis, and methods I am using to investigate the data, and where their work fits in.
This type of work really introduces students to the realities of phonetic research. I enjoy seeing undergraduate students apply their linguistic knowledge to real-life situations for the first time, and seeing them learn the rigors of research. I also supervised one student's BA Honors thesis. Isaac Spencer collected nasal airflow data on Khoekhoe clicks for his project in my Field Methods class, and extended his analysis for his Senior Honors thesis.

Graduate Student Research Supervision

I have served as the Chair on one graduate student thesis, and as a committee member for 7 students at Cornell University. I also participated as members of 3 graduate students at the University of British Columbia. Johanna Brugman started her research on Khoekhoe in my field methods class in 2003. She was the lead student on a project that investigated phonetic differences among voiceless aspirated clicks and voiceless nasal aspirated clicks in Khoekhoe. This is an interesting contrast. Johanna's investigation showed that the voiceless nasals became voiced in different prosodic contexts. I encouraged her to follow through with this research for her dissertation. Her instinct was to drill down on minute phonetic details, and she would often lose focus of the larger linguistic picture. Still, I enjoyed motivating her, and helping her to see the implications of her research for the linguistic structure of Khoekhoe, Khoesan languages more generally, and indeed for all languages. Her dissertation ended up having great implications for these languages, and for linguistic theory more generally, as she showed that there are two prosodic categories smaller than the prosodic word, and larger than the syllable. Her dissertation ended up having being rather theoretical.

My teaching style is interactive at all levels. I encourage students through participation in problem-solving and discussion, and make myself available to talk one on one with students outside of the classroom. My classes are demanding, as my coverage of the topics is thorough. I have forged relationships with many students through my classes, and even more through one-on-one interactions.