

FY2008 Learning Technologies Grants Proposal

(COVER PAGE)

Project Information

Sound technologies for students of language: a digital recording environment

Project Title

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Project Directors

The Department of Romance Languages and the Linguistics Program

Requesting Department

\$9,935.00

Amount Requested Year 1

0

Amount Requested Year 2

Project Directors' Signatures

Proposal Endorsement Signatures

Department Head

Dean

Proposal Abstract (100-word maximum)

This proposal seeks funding for technology necessary for innovative applications of laboratory quality acoustic sampling to language learning and research in Romance Languages and Linguistics. Students would be able to create, analyze, and manipulate sound files for use in language acquisition and linguistic study. The growing role of phonetics-based methodologies in applied and theoretical linguistics underscores the desirability of integrating such an approach with current curricula at UGA. Undergraduate and graduate students would have access to highest-quality acoustic samples, contributing not only new learning opportunities to language-oriented classrooms but also rich avenues of research to upper-level content courses.

Sound technologies for students of language: a digital recording environment

Section I: Project Description

Nature of Innovation

Working with speech requires the ability to prepare and present high-quality samples that can then be used for the purpose of analysis. For years, the use of analog recording equipment in foreign language and linguistics classes has been common practice among US universities, though its purpose has often been that of gathering short, low-quality speech samples which offer only a limited range of uses—e.g. impressionistic evaluation of pronunciation. Today, however, developments in the technology of digital recording have made it possible for students to engage in the process of gathering and manipulating speech samples that conform to current industry standards in phonetic analysis. This technology, coupled with access to a sound-controlled space, allows faculty and students to interact with speech samples in ways that are problematic or even impossible with analog recordings. Our proposal aims to create a digital recording environment consisting of a sound-attenuated recording booth and digital recording equipment. Both undergraduate and graduate students in Spanish and Linguistics courses will create, manipulate, and analyze samples of recorded speech in order to (a) understand and evaluate patterns in second language pronunciation, and (b) explore more generally the process of sound production and comprehension in human language systems. The immediate goal of the project is to make these resources available to both Spanish and Linguistics students, though its potential application is expected to extend well beyond these initial offerings.

We would like to stress that *environment* here goes beyond the local, physical sense of the word. Though our proposal is for a facility with a concrete locus (in 120 Gilbert Hall), we envision this only as the base of a figurative space that extends outward to include the world at large. Students would therefore conduct fieldwork as part of this project, interviewing subjects and collecting samples in the field. This, in addition to on-site interaction with subjects and data in a sound-controlled facility here on campus, provides a full range of learning and research opportunities to students. It is primarily the direct, hands-on experience working with language samples—both for corrective work in second language production and for general linguistic analysis—that constitutes the innovative aspect of this proposal.

Need/Rationale for the Project

Our proposal is particularly opportune at the present time due to the following developments:

1. *Increasing enrollment in language courses.* Between the Fall semesters of 2003 and 2006, the Department of Romance Languages experienced a higher percentage of growth in the number of undergraduate majors (63.5%) than any other academic unit (*Red and Black*, October 09, 2006). Though the majority of these students are studying Spanish, a number of them are double-majoring in other areas, including Linguistics. Currently, students majoring or minoring in Spanish must take SPAN 3050 (Introduction to Spanish Linguistics) and also have the option of taking SPAN 4650 (Spanish Phonetics and Language Variation). Also offered in Romance Languages are FREN 3090 (Introduction to French Linguistics) and FREN 4630 (French

Phonetics), both of which also require considerable work with speech samples, either produced by the students themselves for the purpose of evaluation or recorded and distributed by the professor in order to illustrate points of phonetic interest (e.g. dialect distinctions). There are also a number of undergraduate courses offered through the Linguistics program whose courses rely on access to equipment used for creating and analyzing speech samples. Some of these courses include LING (CMSD) 3010/3110 (Fundamentals of Speech and Voice Science I/II) and LING 3060 (Phonetics and Phonology).

Interest in linguistics courses, both in Romance Languages and Linguistics, has also increased at the graduate level, and in Fall 2008 the Department of Romance Languages will begin offering a PhD in Spanish Linguistics. This will not only result in increased enrollment in our program but will also require resources to conduct doctoral-level linguistic research. Graduate courses requiring lab and fieldwork with data that would benefit immediately from our project include SPAN 6650 (Spanish Phonetics and Phonology), LING 6860 (Introduction to Sociolinguistics), LING 6020 (Phonetics), and LING 6030 (Phonology), as well as the ongoing *Roswell Voices* project directed by William Kretzschmar in the Department of English. Such lab and fieldwork experience contributes directly to the development of graduate level research.

2. *Growing emphasis on acoustic analysis and laboratory phonetics in second language acquisition and phonology.* A number of computer-based language-learning programs now integrate comparative recording in which the language learner's production is compared acoustically to an idealized native production. This is largely a passive exercise, however, typically limited to alerting the student when his/her production fails to fit within pre-established parameters. No specific feedback or access to the signal itself is provided, reflecting the current limitations of such computer-controlled functions. Our proposal seeks the means to collect and analyze samples in-house, enriching what would otherwise be a purely impressionistic exercise into an opportunity to explore the finer acoustic details of language production. Being inherently more flexible, our human-controlled approach would allow for focus on specifics: e.g. vowel quality, intonation patterns, and syllable timing.

In the field of general linguistics, both theoretical and applied, phonetically-based approaches in phonology and sociolinguistics have seen a huge upswing in recent times, as evidenced by new journals (e.g. *Papers in Laboratory Phonology*) and conferences (e.g. *LabPhon, Laboratory Approaches to Spanish Phonology, Phonetics and Phonology in Iberia*). This again reflects recent technological advances and the general accessibility to technologies heretofore prohibitively expensive.

3. *Accessibility of high-quality recording technology.* The dynamism of the field of digital technology has made once prohibitively expensive technology readily available and affordable. Highly portable laptops and top-flight devices such as the USB Pre 1.5 preamplifier and digitizer make possible the recording of highest-quality data directly to hard disk, completely bypassing analog cassettes or even digital audio tape.

4. *Recent technological improvements in the Language Resource Center.* The LRC received Tech Fee funds in Spring 2007 for the establishment of a Phonetics/Phonology Lab in 119 Gilbert Hall, devoted to phonetic and statistical analysis, perceptual testing, and work with pre-existing language corpora. The current proposal would make possible a truly synergistic

relationship, taking advantage of much of the equipment previously funded (see budget below) while providing a physical space for active data-collection.

5. *New faculty with expertise in working with field data.* Recent hires in Spanish Linguistics and the Linguistics Program have collected and worked with data from such areas as Bolivia, Brazil, Costa Rica, Japan, Mexico, Norway, Peru, and Spain. The authors of this proposal—three of these new hires—are committed to integrating fieldwork and acoustic analysis into courses at both the undergraduate and graduate levels.

6. *New courses proposed.* Current course proposals, both at the undergraduate and graduate levels, would directly benefit from this funding and indeed may be viewed as part of the overall project. One new undergraduate course proposed by two of the grant authors is an Applied Phonetics course that concentrates solely on the development of student pronunciation and fluency. This ‘corrective phonetics’ course will depend crucially upon the digital recording environment, which will allow for the detailed analysis necessary to identify the subtleties of what makes for a foreign-sounding accent. The proposal also provides the means to evaluate progress using objective measures rather than subjective, impressionistic approaches, which is innovative in and of itself. The proposal is also key to the development of other new courses, such as SPAN 6860, which require the availability of recording equipment for the purpose of gathering speech samples in the field. Access to digital sound equipment places these courses at the forefront in the application of technology in the teaching of foreign languages and the study of human speech.

Relevance of project to Unit and University priorities

The Department of Romance Languages is dedicated to producing students whose foreign language proficiency extends beyond classroom limitations and includes objectively measured progress in both written and oral abilities. Traditionally, the former of these two areas has been subjected to a greater degree of academic scrutiny than the latter, which is often subsumed under classroom participation or relegated entirely to the study abroad experience. With the incorporation of Service Learning courses that put students in domestic foreign language situations, Romance Languages provides a range of language opportunities that simulate and supplement the immersion experience in a Spanish-speaking country. This proposal seeks to further enrich the department’s set of offerings by providing students hands-on experience in observing and evaluating their own oral production and that of native subjects. The department is further invested in the development of skilled foreign language teachers who will undoubtedly apply the lessons learned through these innovative techniques in their own classrooms. Moreover, partnership between Romance Languages and the Program in Linguistics has resulted in collaboration in the training of students interested in linguistic topics related to Spanish, French, Italian, and Portuguese. With the advent of the new PhD in Spanish Linguistics, this relationship will evolve even further, in part through shared interest in the development of resources for students.

At the University level, our proposal encourages students to be involved in projects that take them outside of the classroom, promoting increased interest in Service Learning and the Scholarship of Engagement. As part of course requirements, students will be expected to interact

with people from different speech communities, gathering speech samples among Hispanic populations in GA or inviting speakers to participate in interview sessions using the sound-attenuated space. This type of involvement in local communities is consonant with the University's interest in advancing local and state issues at the national and international levels and, again, supplements UGA's already impressive student involvement in study abroad.

More generally, we would point out the university's responsibility to graduate students to offer them research experiences that are comparable with those of other Research-1 institutions. These technologies will allow faculty to expose students to methods of data collection and analysis that conform to the standards of the linguistics community. This project thus provides our graduate students with a competitive advantage by making this equipment readily available and involving them in cutting-edge, innovative applications such as experimental approaches to speech perception and analysis.

Section II: Budget

Budget Item	Quantity	Total Cost	Requested from LTG	Other sources
Hardware				
Elite Series recording booth, 6'x6' (Netwell)	1	\$6,995.00	\$6,995.00	
Dell computer workstations (data analysis)	4	\$6,000.00	0	DRL
Laptop computer (in-booth data capture)	1	\$1,300.00	0	Ling
Western Digital 500GB Hard Drive (data storage)	1	\$150.00	0	Ling
Marantz PMD660 Portable Solid State Recorders	4	\$2,000.00	\$2,000.00	
4GB Sony Memory cards	4	\$240.00	\$240.00	
Behringer ECM8000 condenser microphones w/cables	4	\$300.00	\$150.00	DRL
HD280 Professional Sennheiser headphones	4	\$800.00	0	Ling
USBPre 1.5 (pre-amp and digitization)	1	\$550.00	\$550.00	
Software				
E-Prime (computerized testing software)	5 licenses	\$3,475.00	0	DRL
Audition (digital recording software)	2 licenses	\$150.00	0	Ling
SPSS (statistical software)	(site license)	\$550.00	0	Ling
Superlab (testing software)	3 licenses	\$1,785.00	0	Ling

Space allocation				
Gilbert Hall, Room 120 (320 square ft.)		0	0	DRL
Totals		\$24,295.00	\$9,935.00	\$14,360.00

Budget Justification

Elite Series sound booth. The sound-controlled recording booth constitutes a large portion of the requested funding and indeed is crucial to the proposed project. The need for such a facility is evident, given that no comparable space is currently available at the University of Georgia. Sound-insulated areas in Gilbert and Aderhold do not provide a sufficient degree of sound-proofing for reliable acoustic capture. Though the Language Resource Center (LRC) offers facilities in which students can produce class-related samples for general, impressionistic exercises, they are not suitable for detailed acoustic analysis because (a) LRC equipment is designed for large-scale language lab-oriented activities rather than for precision phonetic analysis, and (b) heavy student volume in the LRC creates an environment in which background interference cannot be controlled.

Marantz PMD660 Portable Solid State Recorders (and Sony Memory Cards). As our goal is to extend our recording environment to the field, the proposal requires portable yet precision tools that allow for both the logistics of fieldwork and the demands of recording for linguistic analysis. The PMD660 is an affordable, light-weight digital recording device that takes advantage of the most recent developments in computer technology. It records on compact flash cards and runs on AA batteries.

Behringer ECM8000 condenser microphones w/cables. These condenser microphones, both highly rated and low-priced, were recommended as a top microphone for use in sound-controlled environments (<http://bartus.org/akustyk/microphones.php>).

USBPre 1.5. The USB Pre serves multiple functions, first as a preamplifier to provide the power that condenser microphones require, and as an all-purpose digitization unit for direct-to-computer recording.

Project Timeline

Date	Objective	Persons responsible
December 2007	Submit orders for equipment	Gary K. Baker, Lewis C. Howe, Shigeto Kawahara
January 2008	Install equipment	Baker, Howe, Kawahara
February-May 2008	Integrate lab and field recording into courses (SPN 3050, 4650; LING 6020, 8080)	Baker, Howe, Kawahara
May 2008	Survey student reactions to lab and fieldwork	Baker, Howe, Kawahara

Section III: Learning Outcomes

Learning Goals and Methods for evaluation

1) Students acquire hands-on experience in the collection and analysis of live speech data as a component of the general linguistics curriculum. The grant will thus allow students to conduct and participate in state-of-the-art phonetics and psycholinguistic experiments. In more applied contexts, students participate in acoustic analysis as a part of the language learning process, with the goal of providing practical understanding of the acoustic underpinnings of language production. We thus hope to integrate a ‘corrective phonetics’ component with current curricula in upper-level Spanish.

2) Undergraduate students will be required in both language and content courses to produce digital recordings to be used for self-analysis and diagnosis. The goal is to isolate subtle features of non-native production that contribute to the perception of a foreign accent. In linguistics courses, students will record real speech data for acoustic and perception experiments. Graduate students in both Romance Languages and Linguistics will complete independent projects involving acoustic capture and analysis.

Potential Applications

Linguistics has experienced significant growth in recent years at least in part due to technological advances that have made possible an increasingly detailed understanding of the mechanics of human speech and language processing. This grant would provide students the opportunity to keep up with and participate in current changes in this growing field. We anticipate significant academic productivity to result from the project in student conference presentations and papers, and in faculty-led work carried out in collaboration with graduate and undergraduate students.

The digital recording environment is readily applicable to other areas of language and linguistic study. One particularly promising application is in discourse analysis, in which observation of the subtle interactive dynamics of conversation requires the ability to capture multi-participant interaction in a controlled, noise-free environment. The space requested would provide sufficient room for recording of small groups and interviews with native speakers.

The facility has applications to sociophonetics, as well, in line with work being conducted at present in Linguistics in the *Roswell Voices* project, which is mapping the linguistic community of Roswell, Georgia. The authors of this grant plan to extend this work to the Latino community of Roswell, investigating the nature of English-Spanish language contact in this community.

Section IV: Support Plan

While the digital recording environment is projected to be housed in the Language Resource Center (first floor Gilbert Hall), the current project is a joint undertaking of Romance Languages and the Linguistics Program and will be administered and supervised by faculty in these units. Aside from the grant authors, other faculty have expressed interest in providing support and administration of the proposed facility. Technical support will be provided by the Department of Romance Languages.