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The Impact of Recordings on Student Achievement in Critical Language Courses

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Abstract

This study investigates the relationship between the use of classroom recordings and student achievement in critical foreign languages. Recording classrooms has become popular in recent years with the advent of digital media and inexpensive devices to play such files. It is now easy to create audio recordings of face-to-face classes and post them online. To date, however, there has been little empirical study of the role that these recordings play in students' achievement.

The study involved instructors who were each teaching two identical sections of a Chinese course, and asked them to use a portable audio recorder to capture all of the discussion in both sections. Only the Treatment section's students had the recordings posted online, making the other section a Control group.

The research questions for this investigation were: (1a) If classroom recordings are made available to students, do they use them? (1b) If so, what are their reasons for using the recordings? (2a) Do students perceive that the availability of classroom recordings leads to increased achievement? (2b) Are the perceived benefits of the recordings related to reasons for using them? (2c) What is the relationship between the availability of classroom recordings and benefits of courses perceived by students? (3a) Does the availability of classroom recordings improve student achievement, as measured by student grades from courses with and without access to recordings? (3b) What is the relationship between students' use of the recordings and their actual achievement in their courses?

Students' grades were examined and their perceptions of their achievement were surveyed. The data were analyzed with respect to students' reported use of the recordings, reasons for using them and perceived benefits from using the recordings. Comparisons were made between the Treatment and Control group students.

Findings revealed that a majority of the students in the Treatment sections used the recordings. There was consensus on some of the reasons for using the recordings and some of the benefits of using them. Further analysis of the data showed that the availability of recordings had a significant positive impact on students' grades in two of the three classes studied.

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THE IMPACT OF RECORDINGS ON STUDENT ACHIEVEMENT IN

CRITICAL LANGUAGE COURSES

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THE IMPACT OF RECORDINGS ON STUDENT ACHIEVEMENT IN
CRITICAL LANGUAGE COURSES

To RFS

for all of his love and support

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ABSTRACT

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Elizabeth C. Scheyder

Teresa P. Pica

This study investigates the relationship between the use of classroom recordings and student achievement in critical foreign languages. Recording classrooms has become popular in recent years with the advent of digital media and inexpensive devices to play such files. It is now easy to create audio recordings of face-to-face classes and post them online. To date, however, there has been little empirical study of the role that these recordings play in students' achievement.

The study involved instructors who were each teaching two identical sections of a Chinese course, and asked them to use a portable audio recorder to capture all of the discussion in both sections. Only the Treatment section's students had the recordings posted online, making the other section a Control group.

The research questions for this investigation were: (1a) If classroom recordings are made available to students, do they use them? (1b) If so, what are their reasons for using the recordings? (2a) Do students perceive that the availability of classroom recordings leads to increased achievement? (2b) Are the perceived benefits of the recordings related to reasons for using them? (2c) What is the relationship between the availability of classroom recordings and benefits of courses perceived by students? (3a) Does the availability of classroom recordings improve student achievement, as measured by student grades from courses with

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Chapter 1

Student Achievement and
Classroom Language Learning

All over the world, thousands of hours of classroom meetings are being recorded every semester, but we really know very little about whether these recordings help students achieve better academic success than students achieve in classes that are not recorded. As will be detailed in Chapter 2, students have had access to recordings of classes at some institutions for more than 30 years, and it is assumed that they are a useful tool for them, but to date there has been almost no research to provide evidence that the recordings help students. Given the paucity of research in this area in general, it is not surprising that foreign language classrooms have not been included in any studies published to date. This dissertation study begins to fill that gap in the research by considering the impact of recordings on student achievement in critical foreign language classrooms in particular.

To place the research to date (or lack of it) in context, this chapter provides

background on classroom language learning and achievement as they relate to this study and details the research to date on student perceptions of their own achievement and the use of grades as a measure of achievement. Chapter 2 will review the history of recording classes, including both general classes and foreign language classes, and will consider the early motivations for providing recordings to students. Chapter 3 will outline the evolution of the concept of critical foreign languages and will detail the current motivations and needs for improved student achievement in these languages. Chapter 4 will describe the research questions that provided the basis for this study and will delineate the methodology that was used to address them. The results of the research will be presented in Chapter 5, followed by discussion of these results in Chapter 6.

Student Achievement

Definitions

To begin, we must consider what we mean by "student achievement" in foreign language classrooms. It is just one aspect of classroom language learning, a vast field of research with many debated issues (cf. Chaudron, 1988; R. Ellis, 1990; Freed, 1991) that are beyond the scope of this study. In this research, we are considering student achievement in two ways: as the student's perception of his or her own learning in the course, as measured by survey responses, and as the student's actual achievement in the course, as measured by his or her final grade. Each measure of achievement is described below.

We defined categories of perceived student achievement as just the aspects of language learning that were identified in preliminary interviews with graduate

student language learners when we asked them what they had learned to do in a foreign language that made them feel that they had achieved something in that language. This could include aspects of pronunciation, conjugation, aural or reading comprehension, writing, or anything else that was commonly mentioned by the graduate student foreign language learners, but it is not intended to be an exhaustive study of all aspects of classroom language learning in the typical linguistic terms. After turning the items elicited in these preliminary interviews into multiple-choice responses, students in the study were asked to complete a survey where they checked off the items that they thought they learned to do in this Chinese course.

Students' actual language learning was defined as their final grade in the course, on a scale of A+ to F, corresponding to 4.0 to 0.0 points. While this may not be a perfect indicator of students' actual language learning, it is an accepted measure of their performance in the course, as will be considered in more detail in the sections below.

In the full linguistic sense of the term, classroom language learning encompasses second language acquisition (SLA), foreign language acquisition (FLA) and language learning, which are usually described in linguistic terms, by evaluating a specific feature and its development over time, possibly with a particular instruction or research treatment. This study will not gather the type of data that would allow us to measure any particular feature of the students' language learning, but rather it will try to determine whether classroom recordings have an impact on students' perceived achievement in critical foreign language courses, as defined by their self-reported learning in categories established in advance by other foreign language learners who were surveyed.

This will be descriptive research, grounded in the role of intervention in the learning process, performed in ordinary classrooms at the researcher's university, not in experimental classrooms. The recordings are a new intervention in foreign language classrooms, and although we can make them available at relatively low costs, we have no evidence to indicate whether they contribute to student achievement or not. By focusing on student achievement rather than a specific feature of a specific foreign language, we are looking for results about this intervention that may be generalizable to all critical foreign languages. Nevertheless, we will consider what previous researchers have found about the role of instruction in FLA, particularly as it pertains to the classroom. This chapter will provide a brief survey of the field, highlighting some of the areas most relevant to our topic.

Classroom Language Learning and Instruction

Forty years ago, during the relatively early days of SLA research, doubt was expressed about whether classroom instruction did any good. For example, Upshur's (1968) study of a group of English as a Second Language (ESL) adults in Michigan found that there were "no significant effects [in their ESL progress] attributable to the amount of instruction they received" (as cited in Krashen, 1982, p. 36). Mason (1971) studied ESL university students in Hawaii, some of whom took an intensive ESL program in addition to a regular academic program taught in English, and others who postponed the ESL course and took only the academic program, and concluded that "at least for many intermediate to advanced foreign students . . . intensive EFL [English as a Foreign Language] work may be a waste of time" (p. 197).

By the 1980s, however, the tide of research began to change, as summarized in Table 1.1. Pica (1983) had found methodological problems with both Upshur's (1968) and Mason's (1971) studies because "neither researcher . . . addressed the possibility that their subjects who were not attending ESL classes nonetheless had consulted English grammar books and textbooks for information about the language and its rules" (p. 111), which would provide further exposure to the language, making the studies inconclusive. Krashen (1982) similarly noted that the students in Upshur's and Mason's studies "had a rich source of comprehensible input outside the classroom, and in both cases they were advanced enough to be able to utilize it" (p. 37). He then went even further, saying that Upshur's and Mason's studies, contrary to the conclusions of their authors, show that "language teaching certainly *can* help" (p. 37), insofar as it simply provides input for the student. As an intervention in critical foreign language learning that gives the students an opportunity to review exactly what was said during class, the classroom recordings in this study can be seen as a source of instruction for the students, which means that they may be helpful for the students' acquisition of the language.

Long (1983) also carefully reexamined the results of Upshur (1968), Mason (1971) and 10 other studies. He found that "there is considerable evidence to indicate that second language (SL) instruction does make a difference [in SLA]" (p. 374) and that "Instruction appears to be especially useful in the early stages of SLA and/or in acquisition-poor environments, but neither of these conditions is necessary for its effects to show up" (pp. 379-380). Long describes an acquisition-poor environment as "one in which little or no comprehensible input is available outside the classroom" (p. 376), which would be true for American

Table 1.1: *Does Classroom Instruction Lead to Language Acquisition?*

No	Yes
Upshur (1968) Mason (1971)	Pica (1983) Review - Problems with studies' methodology, so inconclusive Krashen (1982) At least provides Input
	Long (1983) Review - Especially useful in early SLA and/or acquisition-poor environments
	Doughty & Williams (1998) Focus on Form engages cognitive processing and leads to SLA
	Norris & Ortega (2001) Review - Yes, but up to 18% due to maturation or test practice effects

college students studying a critical foreign language in the United States, so our students may be in a position for instruction to be especially useful.

Based on these findings, we have reason to believe that the second language instruction that the students participating in this study receive, both in the live class and in the recordings of the live class, has at least some hope of leading to second language learning for them, and consequently to increasing their perceived and actual achievement in their foreign language classes.

Students' Perceived Achievement

If we are going to ask the students in this study to report their perceived achievements in the course, we must consider whether this can be considered an actual indicator of their learning. This section will summarize the research on this topic, by first considering students' perceptions of their achievement in general courses, and then looking at work on students' perception of their achievement in foreign language courses.

Students' Perceptions of Their Achievement in General Courses

When we surveyed the students to ask them about their perceived language learning, we asked them to review a list of things that they might have learned to do in the language, and check off those that they felt the class helped them to do, which was asking them to do a sort of self-assessment. Boud and Falchikov (1989) provide a good introduction to the reliability of students' self-assessments with an overview of 29 different studies of the topic conducted from 1932 to 1988 across a wide range of subjects at the college level. They conclude that "17 studies report overrating [of their learning by the students], 12 underrating. However, there are on balance more studies with methodological flaws in the former group and so there is no clear overall tendency to be identified" (p. 539). (Note that, in these cases of non-language courses, "achievement" and "learning" are often used interchangeably.) Ten years later, Dochy, Segers and Sluijsmans (1999) reviewed 63 studies of self-assessment, peer-assessment and co-assessment, very few of which were in common with Boud and Falchikov (1989), and conclude that "there is much evidence which supports the view that students' contributions to assessment can be consistent with the assessment of staff, and of other students" (p. 347).

Reports of single studies in various fields have shown varying degrees of correlation between students' perceptions of their own learning and their instructors' evaluation of their learning. For example, Stefani's (1994) study of 80 students' self-assessment on a single laboratory report in an undergraduate course in the UK on biochemical techniques showed high correlation between the marks assigned by the instructors (known as tutors in the UK) and the marks assigned by the students themselves. Stefani interprets this to mean that "use of the

student marks in place of tutor marks would result in a similar ordering of individual performance with only the slightest tendency towards undermarking, particularly with high achievers, but no corresponding overmarking with low achievers" (p. 71). On the other hand, gender differences appeared in a study by Lind et al. (2002), which found that female third-year medical students underestimated their performance on a multi-faceted assessment, while their male peers overestimated their performance on the same assessment.

Although it is not within the scope of this study, there is increasing interest in training students in self-assessment and "seeing the student as an active person who shares responsibility, reflects, collaborates and conducts a continuous dialogue with the teacher" (Dochy et al., 1999, p. 331). This is seen as a goal of instruction because, "to become independent and autonomous, learners must first develop the capacity for self-assessment or self-evaluation" (Stefani, 1998, p. 345).

Students' Perceptions of Their Achievement in Foreign Languages

Students in foreign language classes, however, often over-estimate their achievement in these foreign languages, and according to Gascoigne and Robinson (2001), "less-skilled language students tend to be less skilled at assessing their progress in the language both overall and in terms of individual skills" (p. 118). Assessing progress is very similar to perceiving achievement in the way we have defined it. In the same vein, Blue (1994) notes that when students think that their teachers may see the self-assessment, the students may not be honest about their own perceived limitations, because "it would not do for teachers to form a lower impression [of the student] than necessary" (p. 31), which the students fear might

happen if they admit a weakness that the teacher had not noticed. Daley, Onwuegbuzie and Bailey (1999) found similar results when asking students to assess their foreign language abilities in general, reporting that "most students appear to have inaccurate perceptions of their foreign language abilities, with nearly half of them over-estimating" (p. 8) their own abilities.

Moritz (1996) also cautions us that foreign language (FL) learning "self-assessments not only entail evaluation of one's *own* language proficiency; but involve judgment of the linguistic abilities of *other* people as well" (p. 15), as students will often describe their own abilities in terms of the they way they perceive the abilities of their peers or idealized native speakers. Since the students' knowledge of these others is limited, and since FL students presumably do not live in a population of native speakers of the FL, this comparison may confound the accuracy of their self-assessments.

Relationship between Students' Perceptions of their Achievement and Their Actual Achievement

Although the studies cited above indicate that students' perceptions of their own achievement in critical foreign language courses, as measured by self-assessments, may be higher than their actual achievement, we will assume that any inflation of perceived achievements is common to all of the students, so it will not impact the results when comparing the perceived achievements from two different sections of the same course. Further, we will be comparing the students' perceived achievements separately from their actual achievements, since it is not a purpose of this research to evaluate the absolute accuracy of students' perceived achievements. De Saint Léger (2009) calls students' perceptions of their language

proficiency "a fluctuating and situated variable" (p. 169), referring to changes over the course of a semester and dependent on the primary course topic when the self-assessment was conducted. Although we only asked the students for their perceptions of their achievement once, this was be done after the course had ended and the students were told that their self-assessments would be kept confidential, and would not be shown to the instructors, so we hope to have a more circumspect response than we would have had if the self-assessment was done at a point in the middle of the semester. This gives us some confidence that students' perceived achievements are at least proportional to their actual achievements.

Actual Student Achievement

For this study, we wanted to measure more than just students' self-reported perceptions of their achievement in the courses. We also wanted to measure their actual learning in the critical foreign language, so that we would have some way of comparing the actual learning between the Treatment and the Control groups. Because this study was conducted in actual classrooms, rather than in experimental settings, we did not want to administer any pre- and post-teaching tests, nor did we feel that this would be beneficial, since we were not examining the development of any specific features of language over time. Instead, we chose to use the final grade assigned to each student by the instructor of the course.

Grades as a Measure of Actual Student Achievement

There has been considerable debate about the value of grades as a measure of student achievement over the past several decades, but most of this has focused on

the K-12 classroom (cf. Goldman, 1985; Kirshenbaum, 1973; Kohn, 1999; Madgic, 1988; Malehorn, 1994). There has been some research on college grades, or on grades at all levels including college. Among these studies, authors who argue against the value and validity of the standard A-through-F form of grades say that they are "context-dependent phenomena subject to an enormous number of identifiable factors [whose] exactness must be very much in doubt" (Milton, Pollio, & Eison, 1986, p. 216). More specifically, their detractors have said that grades at all ages are often influenced by student behavior or misbehavior (Hills, 1991), and at the college level they are "confounded by variables such as attendance, writing skills, participation, student preparation, and perceived motivation" (Gorham, 1988), so they are not a pure reflection of student achievement in the subject.

Another line of inquiry has shown that there has been grade inflation in general over the past 50 years (cf. Cushman, 2003; Etzioni, 1975; Wongsurawat, 2009), and that grades are influenced by social pressures outside the classroom, such as during the Vietnam Conflict, when good grades were necessary to avoid being drafted for potentially life-threatening military service (Birnbaum, 1977), further impugning the value of grades as a valid measure of student achievement. Although our study looks at student grades, they will only be used as a measure of comparative achievement, not as an absolute indicator, so grade inflation will not be an issue.

On the other hand, those who support the value of grades as a measure of student achievement argue that they represent "an effort to put back together, to synthesize, the separate judgments that have been made about a student's work" that uniquely characterize a student's performance "*on the whole*" in a given course (Feldmesser, 1971, p. 2). Further, (in Arrington, Modisette, & McKeachie,

1977) McKeachie argues that, while grades may be a commodity because they can be exchanged for admission to graduate schools or employment with corporations, "the value of grades as commodities depends upon the information provided by them" (p. 56), concluding that "mastery grading is a useful way of evaluating student performance" (p. 56). There are even those who argue that grades are simply not necessary for good teaching or student learning (Frisbie & Waltman, 1992). Nevertheless, with a few exceptions such as Evergreen State College in Washington (Evergreen State College, n.d.) and New College of Florida (New College of Florida, n.d.), grades remain a part of the current academic process in the undergraduate programs at most colleges and universities in the United States.

Chapter 2

Recording Classes as a Tool for Student Achievement

Recently, there has been considerable interest in digital media in academic settings, and particularly in "podcasting", where face-to-face class sessions are recorded and made available to students over the web for later review. A study with classes in a variety of different disciplines at the researcher's university by the researcher and her colleagues (Scheyder & MacDermott, 2007) showed that students liked having the recordings available over the web and a majority of students thought that they were "useful in helping [them] learn", although the definition of learning was not explored in this pilot study. These findings were consistent with Traphagan's (2005) conclusions, where he found that making video recordings of class lectures available to students on-demand was perceived by students as a positive learning tool. But neither study addressed whether the recordings provided any actual help to students in their achievement, and neither addressed FL learning, which is consistent with almost all of the research done to

date in the field (cf. Belanger, 2005; Brittain, Glowacki, Ittersum, & Johnson, 2006; Gay, 2005; McNeill et al., 2007; Simpson, 2006). This descriptive study attempts to address this gap in the research by considering the application of classroom recordings only to languages considered "critical", to see if they make a difference in student achievement in this particular area, i.e. critical foreign language learning. As will be described in more detail in Chapter 3, languages such as Chinese and Farsi are considered critical because speakers are needed by the U.S. military for strategic purposes, but are in short supply (Ford, 2009).

There are also a wide variety of ways to record classrooms. The system used by Traphagan (2005) was very expensive and sophisticated, and captured a "lecturing instructor in digital video while integrating and synchronizing any visual (e.g., PowerPoint slides and videos) and audio materials with the lecture video" (p.18), and likely cost tens of thousands of dollars per classroom to install. The pilot study at the researcher's university in 2007 included a variety of more cost-effective technologies, but it only focused on basic issues such as system scalability and students' opinions of the recordings. For this study, we use only the simplest and least expensive tool from those in the pilot study at the researcher's university - an Edirol R-09 portable digital audio recorder that costs less than $250 (B&H Photo Video, n.d.) - because it would be a cost-effective way to obtain professional-quality recordings and expand the use of these recordings to more classrooms if the results warranted it. Although other digital recorders may be even less expensive, advice from colleagues at the researcher's university indicated that the resulting recordings from cheaper devices may not be of good enough quality to be understandable (S. Zamechek, personal communication, October 14, 2009).

A foreign language that has been identified as "critical" by the U.S. government is the focus because this is where such treatments would be most valued. Chinese is one such language, and the instructors in the Chinese Language Program at the researcher's university offer enough sections of the same course every semester to make a study practical. They were very gracious about helping with the 2007 pilot test mentioned above, and they were willing to participate in this dissertation research.

History of Recording Classes

General Classes

More than 75 years ago, Greene and Betts (1933) investigated systems for recording students' speech. Although these recordings would only be used by researchers studying the language produced, their requirements for a recording system were very similar to those used in the 2007 pilot study at the researcher's university and in the present research:

> In the first place, the apparatus must furnish a record so clear and understandable that a perfect transcription of the record could be made and proofread. In the second place, the apparatus must be portable. . . . In the third place, it must produce a continuous and a complete record. In the fourth place, it must be possible for the equipment to be used in the classroom without introducing any unduly artificial conditions. . . . Finally, the apparatus must be reasonably cheap to build and economical to operate. (Greene & Betts, 1933, p.755)

Since equipment meeting these requirements was not commercially available at the time of Greene and Betts' work in 1933, they concluded that it had to be specially built for the purpose!

Less than a decade later, Shane (1940) provided lists of suggested audio-visual equipment for general classrooms, to encourage schools to implement these technologies. These included equipment for recording the students and the teacher, but the items to do this were expensive and unusual, involving a sound recorder and "blanks for instantaneous recording - acetate blanks are best" (p. 425). Shane made it clear however, that the purpose of the sound recorder was to stimulate "interest in phonograph and radio through pupil activity", not to allow students to review a teacher's lessons or reflect on their own contributions. It is also worth noting that these sound recorders cost up to $550 in 1940, which is more than three-quarters of the price of a new Hudson Six automobile for that model year (Hudson Motor Car Company, 1939) and almost twice the price of the Edirol R-09 portable recorders used in this study in 2010 (B&H Photo Video, n.d.).

The use of recording technologies was further encouraged by Title VII of *The National Defense Education Act of 1958* (NDEA), which provided "Federal funds to support research in the use of the new media in education" (Norberg, 1961, p. A5). The NDEA was passed in the wake of the launch of the Sputnik Earth-orbiting satellite by the Soviet Union on October 5, 1957 (Jorden, 1957), a feat which left the United States anxious to increase the emphasis on science and technology in education (National Defense Education Act, Pub. L. No. 85-864, 1958).

Phonographs and records as well as reel-to-reel tape recorders and players (Lare, 1959, p. 448) allowed the wide distribution of audio recordings during this era, but they still only provided pre-recorded materials for students to use, not recordings of the students themselves and their teacher. When Royal Philips Electronics introduced the first commercially successful compact audio cassette in

1963, equipment that could both play and record audio became much less expensive and easier to transport (Clark, 1999). Teachers at all levels began to use pre-recorded cassettes to bring this "new media" into the classroom.

It took more than fifteen years for the recording side of this technology to be widely used in classrooms, and in 1980, Purdue University was one of the first colleges to begin to record audio of face-to-face lectures and make them available on cassette for students to borrow from the library (Gay, 2005). Other universities began to implement this technology, too, and by the late 1980s the the researcher's university had a recording system in a few classrooms (R. Carmichael, personal communication, November 17, 2010). Part of the drive for such systems may have been the desire to accommodate students with disabilities or students who had missed class due to illness, but this quickly became an instance of universal design, where a modification that is made to assist those with a disability is also useful to many other people. The classic example of universal design is the curb cuts in sidewalks at corners, which are installed to assist those in wheelchairs, but are also useful to people with strollers, shopping carts and other rolling equipment (Hesse, 1995). Similarly, the recordings made at the request of a professor in History, English, Biology or any other subject for the benefit of students with disabilities or with illnesses that require them to miss class would also be of use to students who wanted to review. But none of the institutions where classrooms have been recorded for years have reported how often students actually accessed the recordings, which leads to our first research question: If classroom recordings in critical foreign language courses are made available to students, do they use them? We also attempted to learn more about why the students use the recordings, as will be justified in Chapter 5, by making this a multipart question: If so, what are

their reasons for using the recordings?

In a highly-publicized Duke University project in 2004, where every freshman was given an Apple iPod portable digital media player (Kaplan, 2004), the devices were pre-loaded with information to help freshmen become acclimated to campus (Menzies, 2004). After that, it was up to the students and their professors to decide what to load on the devices, but administrators expected them to be used both for pre-recorded supplementary course content and for recording lectures. Ultimately, sixteen courses in nine different subjects used the iPods "to record lectures and classroom interactions" (Belanger, 2005, p. 7). The project at Duke found that "although some data were gathered to support the value of recording lectures, the extent to which having access to lecture recordings improves student performance . . . remains unknown", and the iPods did not provide sufficient recording quality for more than small-group discussions (pp. 6-7). It is the high-profile nature of some of these projects, none of which address impacts on student performance, that has led the researcher to wonder if recordings are being made available to students because the students demand them as the latest "tech craze", because they provide good publicity for the school, because they have become routine after more than 30 years, or because they have a real effect on student achievement.

It wasn't until the advent of podcasting in 2004 that the process could be simplified, eliminating the labor-intensive step of duplicating cassette tapes made from classroom-wide recordings. Podcasting is a term coined by Ben Hammersley (2004) to refer to making digital audio recordings available online, either to the public or to paid subscribers or an otherwise restricted group of users. This made it possible for recordings of face-to-face classes to be created by the universities

(using more sophisticated recording equipment than an iPod) and quickly posted online for access by any student in the class, without the need to borrow cassettes from the library. By 2005, Purdue University, the University of California at Berkeley and the University of Texas at Austin were among the first universities to podcast lectures (Gay, 2005; Read, 2006; Traphagan, 2005) and Pick-a-Prof was even beginning to sell recordings of lectures to students at a few universities (Carnevale, 2005). Early in 2006, Apple Computer, whose iPod digital music player is the eponym for "podcasting", announced the iTunes U service, where universities could post recordings on servers owned by Apple, and students could access the materials on any computer using the free iTunes software (Young, 2006). Although any type of recording can be posted on iTunes U, the intent was that recorded lectures would be posted there, either just for students or for the public at large.[1]

Unfortunately, as with the Duke project, the studies that accompanied these introductions of technology focused on student satisfaction more than on student achievement. Traphagan's results were typical of the group when he reported that students at Austin "perceived webcasts to be a helpful learning tool for succeeding in class, but the impacts of webcasts on their performances in terms of grades and test scores [was] not clear" (2005, p. 7).

Later projects gathered more data, such as one at the University of Michigan School of Dentistry where 72.7% of respondents in the study of dental students reported that access to recordings of lectures positively affected their exam grades (Brittain et al., 2006, p. 27). Projects like this have continued to spread to new

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[1]The the researcher's university has had a presence on iTunes U since 2007, but only publicly-accessible content is stored there, not recordings of academic courses, which the university requires to be restricted to students in that particular course.

universities and new departments within universities, and recent work shows that the idea of recording educational encounters is spreading to other situations with success. A 2010 study in Scotland used portable audio recorders to tape patients' informed consent consultation with a cardiologist in the days before surgery, then gave the patient the tape, and found that the recordings "imparted significant benefit to the patients' degree of knowledge" (Mishra, Mathias, Millar, Nagrajan, & Murday, 2010, p. 386).

Recordings and Student Achievement

Unfortunately, very few studies have carefully assessed the effects on student achievement when simple audio recordings of university lectures are provided to students in face-to-face classes. Simpson (2006) studied graduate students at the University at Buffalo - State University of New York who were given access to a video and audio recording of class lectures. Although there was no control group of students in the same course who did not have access to recordings, Simpson found that

> student response to the query, 'Overall, how much do you feel you have learned in this course?' was not significantly different from past cohorts who completed the same course without the benefit of asynchronous access. However, the introduction of asynchronous access appears associated with an increase in student assessment of the instructor's effectiveness, as well as their overall rating of the course. (p. 532)

Another large study across multiple universities in Australia (Gosper et al., 2007, 2008; McNeill et al., 2007; Phillips et al., 2007) provided undergraduate and graduate students in a variety of disciplines with video and audio recordings of their lectures over the Internet, which they call web-based lecture technologies

(WBLT). Again, there was no control group of students who did not have access to recordings, but Gosper et al. reported that "66.7% of respondents indicated that using WBLT either helped them in a significant or a moderate way to achieve better results" and "four in every five (79.9%) respondents indicated that WBLT had made it easier for them to learn in either a significant or a moderate way" (2007, p. 2). We have investigated whether the students in our study report similar impressions with our second research question: Do students perceive that the availability of classroom recordings leads to increased achievement? We will probe the details of this issue by making this a multi-part question, where the second part of the question is: Are the perceived benefits of using the recordings related to the students reasons for using them? The third part of the question seeks to identify correlations in this data by asking: What is the relationship between the availability of classroom recordings and benefits of courses perceived by students?

Foreign Language Classes

Foreign language instruction has kept up with new technologies all along, and Hocking (1964) wrote that college language laboratories using pre-recorded language samples delivered to students via headphones were installed as early as 1904, but these systems provided only playback, with no recording done by the students. In 1924, the technology for recording had advanced, and Ohio State University installed one of the first language laboratories that allowed students to listen to prompts and record their responses (pp. 11-13). Systems like this were widely advertised in the 1930s, but they remained very expensive, and companies such as the "Speak-O-Phone Recording Studios of New York offered its recording

unit for $475" (p. 12). Still, these were for use by students on their own, not for recording face-to-face classes.

The popularization of the compact audio cassette in the mid-1960s made it economical and convenient to play audio recordings in all types of lecture and seminar-style classes, including foreign language classes, but although these devices could also make recordings, there is no evidence that this technology was ever widely used to record entire language classes. However, compact audio cassettes allowed the college language laboratory to evolve by the mid-1960s to a more cost-efficient model where an individual student could listen to a prompt and then record and play back his or her own response on cassette, repeating this sequence and re-recording the response until satisfied with the result (Hutchinson, 1963; Chomei & Houlihan, 1968). While earlier disc and cylinder recorders could only be recorded once, cassette tape recordings could be erased and re-recorded easily, further improving the economics of this model. It is important to note, however, that this was still only a recording of a single student, not a recording of a face-to-face class.

Nevertheless, when the recording of face-to-face lectures began at places like Purdue University in 1980 (Gay, 2005), the recordings were almost exclusively of classes with a single professor lecturing to a classroom for the entire period, with little or no interaction. This delivery model, known colloquially in universities as a "sage on a stage" (King, 1993, p. 30), effectively eliminates foreign language classes from the recordings, since they meet in smaller groups and involve interaction between the instructor and students. This may be because it was perceived that the lecture delivered by the "sage" was the most important type of content to be captured, because it was difficult to capture the voices of students

responding, or even because privacy concerns made recordings that captured student voices more difficult to distribute securely.

Even when students could take class recording literally into their own hands with iPods in the 2004 Duke project, it seems that they did not widely use them to record language classes. Instructors distributed "language materials such as songs, news broadcasts, and poems" (Belanger, 2005, p. 15). Students reported that they recorded lectures to be able to review material and "to be able to listen to difficult portions several times" (p. 7), but these seem to be non-language "sage on a stage" lectures. The only recording of interaction that was mentioned was for students who recorded peer comments on their work instead of making written notes about it (p. 8), which also apparently was not in language classes.

Considering the fact that lecture recording is state-of-the-art in instructional technology for face-to-face classes and that McNeill et al. (2007) found in the multi-university study in Australia that students were "keen on listening to the discussion amongst the attending students" (p. 272), it is surprising that Duke University did not include foreign languages in the variety of classes that were recorded, nor did students at Duke report using their iPods to record foreign language classes (Belanger, 2005). Further, in view of the fact that a variety of studies cited above have shown that providing recordings of face-to-face classes to students improves achievement, the lack of research on recording foreign language classes is a gap in the literature that the present research hopes to begin to fill. We also have attempted to address the question that no one has asked yet with our third research question, which is also in two parts: Does the availability of classroom recordings in critical foreign language courses improve student achievement, as measured by student grades from courses with and without access

to recordings? What is the relationship between students use of the recordings and their actual achievement in their courses?

Benefits of Recordings of Foreign Language Classes

Although it is not the intent of this study to analyze or attempt to control all of the methods used by the teachers conducting the foreign language classes that will be recorded, it is worth considering what benefit the students may gain from having access to these recordings. Because this is a study of a simple recording of a face-to-face class that the students presumably attended, we are not considering any of the issues associated with traditional computer-assisted language learning (CALL) activities, where learning materials are created to be delivered via software only. On the other hand, a recording of all of the talk in a classroom will presumably capture all of the techniques that a good teacher uses, and make them available for the students to review. Naturally, this assumes that we accept that formal instruction in a second language is helpful, which has not been without question in the field, as was discussed in more detail in the previous chapter, but which can be summarized by a statement in Long's (1983) paper, *Does second language instruction make a difference? A review of research*, which he answered with a "not-so-tentative 'Yes'" (p. 380).

Despite the lack of research to date on recording foreign language classes, which the present study hopes to address, we are encouraged by research that has shown the benefits of providing recordings to students in other types of classes. For example at Duke, Belanger (2005) reported that students benefited from using

class recordings "to emphasize listening and participation. ... to review for exams or to make up missed classes ... [and] to record and share verbal feedback on essays and other assignments" (p. 6). These benefits were echoed by students at Purdue (Gay, 2005), who have had access to cassette tapes of lectures for many years, and more recently have access to digital recordings of classes. There, students praised the recordings' usefulness for "reviewing what I might have missed while I was taking down notes" and for "review[ing] a lecture, if I didn't quite understand it in class" (p. 16), which would seem to be particularly salient for students in a foreign language class.

Additionally, although the recordings in this study will be made in classes where attendance is mandatory, and thus will be a supplement to face-to-face teaching, some of the benefits realized by students who only have access to pre-recorded lectures may also be conferred, which Griffin, Mitchell and Thompson (2009) summarized as

- Place: students have the flexibility to learn in a location of their own choosing provided there is a computer available;
- Pace: students can learn at their own desired speed and do not have to keep up with the lecturer;
- Peace: students can choose the time in which they learn picking moments of peace and quiet most appropriate for learning, and
- 'Process': students can choose the means by which they learn, selecting the learning process most suitable for themselves. (p. 537)

Ellis (2008) reiterates similar benefits cited in a variety of studies as well as one that is subtly different in ways that may be salient to foreign language students: "knowing that the lecture is available for multiple viewings ... [the students take notes] which record their own responses to and syntheses of the presented material" (p. 12), rather than scrambling to write down every word that is said.

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In the foreign language classroom, this may allow students to reflect on what is being discussed and spend more time processing the information during class.

Finally, it is of particular interest that Simpson (2006) studied the use of recordings in a classroom of mixed native speakers of English and English as a Second Language (ESL) students and found that "ESL students were markedly heavier users of the [recorded lecture] system and reported most enthusiastically on its benefits" (p. 527). Simpson's ESL students particularly praised the recordings because they allowed them to "clarify some concepts I do not understand the first time" and "'pause' ... to check the [*sic*] word I do not know immediately" (p. 534). It can be argued that all of the learners in a foreign language class are second language speakers of that language, so the additional benefits to ESL students in Simpon's study also may be benefits to the students in this research.

Chapter 3

Critical Foreign Languages

Although some authors say that "there's a long tradition of bemoaning Americans' inadequacy in foreign languages" (Room for Debate, 2010, February 7), the modern concern on this topic has typically been in response to military and defense challenges. When the Army Specialized Training Program was set up at the beginning of World War II, it included a Foreign Area and Language Study Curriculum because "it was clear ... that the normal process of classification and assignment within the Army would not uncover a sufficient number of men with the proper language qualifications" (Agard et al., 1944, p. 4). Although the terms "critical" and "strategic" were not yet applied to foreign languages at this point, it was clear that there was a particular interest in "the languages and peoples of regions in which it was likely that our forces would be operating" (p. 3), presumably mostly German, French, Italian and Japanese at that time.

In addition to supporting technology in education as previously mentioned, the NDEA of 1958 declared that "the present emergency [the space race begun by the launch of Sputnik] demands that additional and more adequate educational opportunities be made available" for students "in science, mathematics, and

modern foreign languages" (National Defense Education Act, Pub. L. No. 85-864, 1958, §101). In 1959, the adjective "critical" was first officially applied to foreign languages when the NDEA was supplemented by a report from the Commissioner of Education that designated "six critical languages – Arabic, Chinese, Hindi-Urdu, Japanese, Portuguese, and Russian – as requiring primary emphasis" in American education (U. S. Office of Education, 1961, p. 24).

Toward the end of the "long peace", a term coined by Gaddis to describe the Cold War and "the longest period of stability in relations among the great powers that the world has known in this [20th] century" (1986, p. 142), the focus for education initiatives gradually shifted from military and defense needs to commercial ones. By the early 1980s, Americans became concerned about the country's position in an increasingly competitive world marketplace and education was identified as one facet of competitiveness. The National Commission on Excellence in Education declared in *A Nation at Risk* that "what was unimaginable a generation ago has begun to occur – others are matching and surpassing our educational attainments" (1983, p. 2). The risks of allowing educational standards to slip were described in starkly military terms as "unilateral educational disarmament" to emphasize their importance for national security (p. 2), and foreign languages were included in the subjects that were critical to the effort. But at this stage, foreign language instruction in general was deemed important, and no specific languages were listed to update those of the NDEA. Presumably, local decisions could be made about which foreign languages would be taught, based on demand from students.

Further, the phrase "critical foreign languages" lost some of its urgency during this time, and in some circles it became synonymous with Less Commonly

Taught Languages (LCTLs) (Ryding, 2001). The expression was even used casually and without explanation of the criticality of the languages involved, as in *Improvement of instruction in critical foreign languages: A report on the 1987 Languages for Communication Workshops at Tarrant County Junior College Northeast Campus*, which dealt only with instructors in "French, German, Spanish, and English for Speakers of Other Languages" (Harper, Lively, & Kaatz, 1987, p. 22). The importance of foreign language education for American competitiveness and the lack of importance of the word "critical" in that context were further underlined by the Economic Security Act of 1987, in which, as one editorial wryly notes "the official list of 'critical' languages . . . includes *all* of those taught at the secondary and college levels" (Garfinkel, 1987, p. 325).

The long peace cited by Gaddis (1986) was shattered by the terrorist attacks of September 11, 2001, and within six weeks articles began to appear describing how the events would change educational priorities and course enrollments. In the Fall 2001 semester at the University of Chicago, where classes began on September 21st (University of Chicago, n.d.), "enrollment in elementary Arabic . . . jumped by about 70 percent" and administrators expected the language to become more "mainstream" (Cox, 2001, p. A16). The description of foreign languages as "critical" also took on renewed significance, which it has maintained to this day. The final 2002 U.S. federal budget included "a record 26-percent increase for Education Department programs that support the study of foreign languages", and a bill introduced in December 2001 proposed another $20 million for a Homeland Security Education Program that would "provide an intensive education in certain foreign languages deemed critical to national security" (Hebel, 2002, p. A26), but this additional funding legislation was never passed (Homeland Security

Education Act, S. 1799, 107th Cong., 1st Sess, 2001).

The perception of critical foreign languages as an important element of national security continued in the years after 2001, but by the middle of the decade, articles were appearing decrying the lack of progress on meeting the challenge (e.g., Scott, 2005; Mathews, 2006). In early 2006, President Bush proposed a renewed dedication to the effort, including government spending of "$114-million to teach languages critical for national security to students from kindergarten through college" (Field, 2006, p. A26), which was enacted as the *National Security Language Initiative* (U. S. Department of Education, 2008). The U.S. Navy took direct action on the topic, increasing Foreign Language Proficiency Bonuses paid to sailors demonstrating listening and speaking skills in "strategic" languages deemed "crucial to the Navy's mission" (Frith, 2006). The Department of Defense (DoD) as a whole has also taken an interest in strategic foreign languages, directing in 2005 that "the Under Secretary of Defense for Personnel and Readiness shall . . . publish a DoD strategic language list and update it annually" (U. S. Department of Defense, 2005) and then significantly increasing the DoD-wide Foreign Language Proficiency Bonuses in 2007 (U. S. Department of Defense, Office of the Under Secretary of Defense (P&R), 2007).

The DoD language list is now published by the U.S. Navy, which supplements the list with languages of particular importance to their operations and publishes the complete list as a notice that is available under a Freedom of Information Act request (S. Bluestein, personal communication, December 7, 2010) and sometimes subsequently published online by the requester (cf. U. S. Department of Defense, Department of the Navy, Office of the Chief of Naval Operations (MPT&E), 2009b) or inadvertently by the Navy (cf. U. S. Department of Defense,

Department of the Navy, Office of the Chief of Naval Operations (MPT&E), 2009a) due to administrative error (S. Bluestein, personal communication, December 7, 2010). Within the Strategic Language List, there are further subdivisions into "Immediate Investment", "Stronghold" and "Other" languages. Immediate Investment languages are the most important and carry the highest Foreign Language Proficiency Bonus because the "DoD requires a substantial organic capability through 2019" (U. S. Department of Defense, Department of the Navy, Office of the Chief of Naval Operations (MPT&E), 2009b, p. 2). Stronghold languages are slightly less prized and are "those for which an on-call, surge capability is required in response to crisis and contingency needs" (p. 2) which may arise in the future. Although the Navy includes languages in both the Immediate Investment and Stronghold categories, it also appends the Navy "Other" list to the Strategic Language List, identifying additional languages where the "Navy has an identified and continuing need" (p. 2).

Current Motivations and Needs

As we enter the second decade of the 21st century, the pendulum has swung back to more of a balance between economic competitiveness and military preparedness as driving forces for foreign languages needs. Government reports say that "39 percent of officers assigned to LDPs [language-designated positions] in supercritical languages still do not meet the requirements for their positions" (Ford, 2009, p. 11), where supercritical languages are "Arabic (Modern Standard, Egyptian, and Iraqi), Chinese (Mandarin), Dari, Farsi, Hindi, and Urdu" (p. 6), echoing three of the six languages cited by the Commissioner of Education nearly 40 years ago (U. S. Office of Education, 1961, p. 24).

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Table 3.1: *Enrollments in Supercritical Foreign Languages*

Language	Enrollments		
	2006	2009	Change
Arabic Modern Standard	23,974	35,083	+46.3%
Arabic, Egyptian	56	110	+96.4%
Arabic, Iraqi	0	61	
Chinese, Mandarin	51,582	60,976	+18.2%
Dari	104	17	-83.7%
Farsi	243	322	+32.5%
Hindi	1946	2207	+13.4%
Urdu	344	335	-2.6%
Totals	78,249	99,111	+26.7%

Note. Data in rows 1 and 4 from "Enrollments in Languages Other Than English in United States Institutions of Higher Education, Fall 2009," by N. Furman, D. Goldberg and N. Lusin, 2010, Table 1a, p. 19. Data in all other rows from Table 8a, pp. 29-33. Copyright 2010 by The Modern Language Association of America. Adapted with permission.

Articles also continue to bemoan the state of foreign language education in the United States, but include languages important for international business when they say that "many more middle and high school students are studying the dead language spoken by Caesar and Nero than such critically important tongues as Chinese, Arabic, Hindi, Farsi, Japanese, Russian and Urdu combined" (Beale, 2010). Further, although "thousands of public schools stopped teaching foreign languages in the last decade" due to budget cuts (Dillon, 2010, p. A18), the Fall 2009 MLA Enrollment Survey showed an increase of 6.6% in foreign language enrollments at the college level between 2006 and 2009, on top of a 12.9% increase from 2002 to 2006 (Furman, Goldberg, & Lusin, 2010, p. 3). Table 3.1 excerpts the data from this survey, showing that enrollments in the eight supercritical languages (Ford, 2009, p. 6) rose even more sharply, increasing by 26.7% during

the same period.

The Fiscal Year 2010 Strategic Language List includes 41 languages or dialects in the Immediate Investment category, of which only five are flagged as Dominant in Force, which would indicate "sufficient capacity for known requirements" (U. S. Department of Defense, Department of the Navy, Office of the Chief of Naval Operations (MPT&E), 2009b, p. 2). This leaves 36 Immediate Investment languages for which there is insufficient capacity in the DoD and Navy, including the eight languages and dialects listed as supercritical in the previously cited Department of State 2009 report (Ford, 2009, p. 6). It is the goal of this research to determine whether an inexpensive way to record class discussions would be an effective tool for foreign language learning that could help teachers and students who want to address this critical need in government and commerce for speakers of certain foreign languages.

Chapter 4

Methodology

For recordings of class discussions to have an impact on students' critical foreign language achievement, the procedure for making and distributing the recordings must be simple and quick, so that it is not too much of an added burden on the instructor. Although the desire to evaluate a reasonably-priced tool for making the recordings rules out automated systems installed in classrooms, the goal of simplicity has remained important in developing the recording-related methodology described in this chapter.

Research Questions

After reviewing the research to date on classroom language learning and classroom recordings and considering the need for more speakers of critical foreign languages, we would like to determine whether classroom recordings may be beneficial for critical foreign language learning. To this end, the following research questions are posed:

Research Question 1

- **RQ1a:** If classroom recordings are made available to students, do they use them?
- **RQ1b:** If so, what are their reasons for using the recordings?

Research Question 2

- **RQ2a:** Do students perceive that the availability of classroom recordings leads to increased achievement?
- **RQ2b:** Are the perceived benefits of using the recordings related to the students' reasons for using them?
- **RQ2c:** What is the relationship between the availability of classroom recordings and benefits of courses perceived by students?

Research Question 3

- **RQ3a:** Does the availability of classroom recordings improve student achievement, as measured by student grades from courses with and without access to recordings?
- **RQ3b:** What is the relationship between students' use of the recordings and their actual achievement in their courses?

Participants and Setting

Research was conducted during the Spring 2010 semester at the researcher's university, where she has been employed as a Senior Instructional Technology Specialist for more than ten years, and where the research was granted approval by the Institutional Review Board as Protocol #811232 (E. Meagher, personal communication, March 3, 2010). Of the eight supercritical foreign languages listed in the previously cited Department of State 2009 report (Ford, 2009, p. 6) and shown in Table 3.1, Modern Chinese has the highest enrollment at the researcher's university and was the only language on the list to have multiple sections of the same course taught by the same instructor during the Spring 2010 semester, as is usually the case.

As Ellis (1990) points out, "one of the main problems [with classroom research] is that there can be no certainty that the instructions given to teachers are actually carried out by them ...so there is no guarantee that the 'treatments' really are different" (p. 10). By using an instructor who is teaching two sections of the same course, using the same syllabus with students who selected their own section, presumably based on the convenience of the time for their schedules, as detailed in the paragraphs below, and having the instructor record both sections of the class, we feel that we are safe to assume that the teacher will teach both sections of the class in the same way. Fortunately, the Chinese Language Program in the Department of East Asian Languages and Civilizations has several instructors who meet the multiple-sections criterion and the faculty, who were very gracious about helping with the 2007 pilot test mentioned above, were also willing to work with the researcher on this dissertation research. Because the program was short on staff during the semester of the study, the researcher posted the recordings

to the server for the instructors, as described in the Procedure section, which also provides additional confidence that the treatment was conducted as planned and was completely uniform. Server records of file upload dates confirm this.

In consultation with the Chinese Language Program Coordinator, instructors who were teaching two or more sections of the same Chinese language course during the Spring 2010 semester were invited to have their classes participate in this research (Appendix B). Although there were a variety of different Chinese courses in this study, each course had all of its sections taught by the same instructor, who was asked to teach all sections identically. Thus, one section could be recorded and posted for students in that section, with the other section of the same course, taught by the same instructor in an identical manner, used as a control group.

Of the five instructors contacted, two agreed to participate with a total of three two-section courses. The instructors who declined to participate were supportive of the research but cited heavy teaching loads due to reduced staffing in the department and other professional obligations that prevented them from accepting any additional responsibilities that semester. Thus, the research was conducted with the classes and instructors shown in Table 4.1.

The research subjects were all undergraduate students at the researcher's university who were taking daytime and evening classes in Chinese through the university's School of Arts and Sciences. Daytime classes are composed primarily of full-time undergraduates who are likely to be 18 to 23 years old, but they may also have a few students from the the university's evening program, which is open to anyone over 21 years old and which often attracts older adults. Evening classes, such as the CHIN372 course in the study, are taught through the evening program,

Table 4.1: *Classes Participating in the Study*

Course-Section	Instructor	Meetings	Enrollment
Beginning Modern Chinese II			
CHIN012-003	MD	MTWR 12-1	17
CHIN012-004	MD	MTWR 11-12	15
Intensive Modern Chinese III & IV			
CHIN022-001	CL	MWF 10-12 and TR 10:30-12	9
CHIN022-002	CL	MWF 3-5 and TR 3-4:30	20
Advanced Spoken Mandarin II			
CHIN372-680	CL	M 6:30-8 and W 5-6:30	15
CHIN372-681	CL	TR 4:30-6	16

Note. Meeting days are Monday through Friday, where T = Tuesday and R = Thursday.

but full-time day students may also take them if that is the only time a particular course is offered. Only two students in any of the classes participating in the study, including the evening class, were actually evening program students, and all of the others were full-time day students. This is not unusual for the evening CHIN372 course, because that particular course is never offered during the day. Both of the evening program students in the study appeared to be less than 30 years old, which was confirmed by a simple web search of public records, so they were determined to be in the same general age group as the full-time day students. Adults were particularly chosen for this study because the concept of critical foreign languages implies that there is a critical need for the learning of these languages among the employees of the Department of Defense and related companies, as described in Chapter 3, who would all be adults.

Although class sizes for these Chinese courses at the researcher's university

are officially limited to 15 students, they may have up to 20 students in case of high demand, and only CHIN022-001 had fewer than 15 students, with 9 enrolled during the semester of the study. The selection of the classes participating in the study are described in the Procedure section below, and the class enrollments are shown in Table 4.1. Differences in enrollment may be attributable to students' need to schedule around other class meetings, particularly for CHIN022, which met for nine hours every week, compared to four hours per week for CHIN012 and three hours per week for CHIN372. Differences in class size are not considered relevant to this research because they are all within expected ranges for foreign language courses.

Students also may have chosen a particular section of a multi-section course based on the time it met, even if both sections fit into their schedules, because they considered themselves to be at their best for learning during a particular time of day. Fortunately, two of the three courses in this study had sections that met at roughly the same time of day, with both sections of CHIN012 meeting at mid-day and both sections of CHIN372 meeting in the late afternoon and early evening. Only CHIN022 had significantly different meeting times for the two different sections, with Section 001 meeting in the late morning and Section 002 meeting in the afternoon. Our consideration of the results took into account possible differences between the learning preferences of students in morning classes versus afternoon classes, but both classes met during normal business hours, so we did not anticipate any major difference between the two sections.

Research Design and Variables

This study is designed with one independent variable:

- the availability of classroom recordings

and three dependent variables

- students' use of the recordings
- students' perceptions of their achievement and
- student achievement, as revealed in their grades.

For the independent variable, REC, students were divided into two groups, namely those in sections with access to recordings (REC=1) and those in sections without access to recordings (REC=0). The study's treatment is the availability of recordings, so this division of students gave us a treatment group (with access to recordings) and a control group for comparison, both within actual classrooms rather than purely experimental settings.

The first dependent variable, students' use of the recordings (USE), was chosen to determine whether students actually make use of a potentially helpful tool when it is made available for them. It may also be used as another independent variable, to track the achievement of students who used the recordings compared to that of students who had access to the recordings but did not use them. No matter how beneficial any treatment is shown to be by prior research, it will not do the students any good if they do not take advantage of it. Although past studies have reported that students will listen to classroom recordings if they are easily available (cf. Brittain et al., 2006; Scheyder & MacDermott, 2007; Traphagan, 2005), it is important to know whether the students in this study actually accessed the recordings, and how often they did so, to know whether this technology was accepted by them. The researcher intended to measure this variable both by obtaining actual records of file access from the server and by asking the students to self-report on their use of the recordings in

the end-of-semester survey for students in sections with access to recordings, detailed in Materials, below. Unfortunately, at the last minute, it was discovered that the current file system in use at the researcher's university does not record file access in protected directories, where only certain people can log in to view files (A. Matthews, personal communication, February 21, 2011). This was contrary to information that system administrators had provided in discussions prior to beginning the study, but the researcher believes that enough information can be obtained from the students' self-reporting in the end-of-semester survey to be able to use this data as a dependent variable.

The survey also asked students about how they thought that the recordings affected their achievement, using a checklist of indicators of achievement created from prior surveys, as described in detail in the Materials section, below. This provides data for the second dependent variable. There will be several aspects of this variable, which we will collectively call ACHIEVE. Although we must be careful about how much we rely on students' perceptions of their achievement in foreign language classes, as discussed in Chapter 1, we are including this question because it may elicit more information from students about the usefulness of the recordings. While the studies discussed in Chapter 1 asked students to evaluate their progress in a foreign language course (Gascoigne & Robinson, 2001; de Saint Léger, 2009) or their overall proficiency in a language (Blue, 1994; Daley et al., 1999; Moritz, 1996), we only asked students how they think availability of recordings helped them learn the language. By avoiding questions of overall proficiency or absolute progress in the language, we are avoiding the pitfalls described by these authors and gaining valuable data.

Final grades were obtained from each instructor and were compared as the third dependent variable, GRADE. Although there are ongoing concerns about grade inflation, as described in Chapter 1, we are comparing the grades assigned by one teacher to the students in both of his or her classes, i.e., the class with access to recordings and the class without access to recordings. By only looking at comparative grades from the same instructor in a single semester as a measure of student achievement, the absolute value of the grades will not be an issue. Finally, after considering the arguments of those who say that grades are not an accurate assessment of student achievement (cf. Milton et al., 1986; Gorham, 1988) and that they should be abolished (cf. Frisbie & Waltman, 1992), we have decided to include them in our study because they are a common measure of student achievement across almost all colleges and universities in the United States, including the site of this study.

The measures described above were suggested by the pilot study at the researcher's university (Scheyder & MacDermott, 2007), but were refined and reworked after reviewing a wider variety of recent research on classroom recording (cf. Belanger, 2005; Gay, 2005; Gosper et al., 2008; Shannon, 2006; Simpson, 2006; Traphagan, 2005). The pilot study at the researcher's university included classes in Biology, Chemistry and History rather than language classes, and it did not use an independent variable because it was primarily a feasibility study to determine whether it was practical and economical to provide classroom recordings at all, so only classes that were recorded were surveyed, with no control groups. It did, however, include the same dependent variable of students' use of the recordings, but it only asked students to report how many of the recordings they used and it did not check server logs. The pilot study also measured students' perceptions of

their achievement, as this study does with the second dependent variable, by asking an opinion question about whether students felt that the recordings were useful in helping them learn, but this study used a checklist of specific behaviors and uses of the recordings, which was developed after a preliminary survey of language learners and teachers. This is described in more detail under the Procedure section below, and was done to obtain more concrete, quantifiable results. The pilot study did not measure students' actual grades, but this study will do that, as suggested by the work of Simpson (2006), to attempt to gain a more quantitative insight into the effects of classroom recordings than most prior studies have provided.

Although Simpson used "comparable sections" from prior semesters (2006, p. 533) for comparison, and Gosper (2008) used a similar structure of comparing one semester to another, there has been no research to date that directly compares two sections of the same class taught by the same instructor. The addition of a control group, with students in a second section of the same course in the same semester that is taught by the same instructor but that did not have access to the recordings, adds an important independent variable to this study that the researcher hopes has added strength to the conclusions derived from the measures.

Treatment Equipment

Each instructor was loaned an Edirol R-09HR Portable High-Resolution Audio Recorder (B&H Photo Video, n.d.) and given a sheet of instructions (Appendix A) and a supply of batteries to run the device. These recorders were chosen by the School of Arts and Sciences' Equipment Loan program at the researcher's university because they are compact (only a little larger than a deck of

cards) but effective for making professional-quality recordings of the discussion around a table or in a small classroom. As Magid notes in his review, these are "dedicated systems" (2006, p. C9) that are well-suited to making podcasts. Suitability for this particular recording purpose was demonstrated during the 2007 pilot study that preceded this research (Scheyder & MacDermott, 2007). The recorders are also very reasonably priced for the quality of recordings that they make, and were purchased by the School of Arts and Sciences in late 2009 for $265.00 each, making them an inexpensive addition to classrooms if they prove useful in improving critical foreign language learning.

Recordings were made as MP3 digital audio files and uploaded from the Edirol recorders to secure directories on a university media server known as "media.sas". A directory was created for each section that was to be given access to the recordings, and only students registered for that section of the course could access the directory. User access was managed automatically on this server by a system linked to course enrollments, and users were required to log in with their unique user name and password to view files. Once there, students could either play the MP3 recording directly on the computer they were using, or download the recording to play later or transfer to a digital audio device such as an Apple iPod. This secure access system is used for many different types of classes in this school within the researcher's university, so that instructors may post copyrighted material and limit its access to just registered students in the class. Media.sas is separate from the university's learning management system (LMS), Blackboard Learn, because media.sas is optimized to store and serve large media files for just one school within the university, while the Blackboard Learn system is intended as a complete LMS to perform a wider variety of functions for students and faculty in

several of the schools within the University.

Research Procedure

To avoid any possible bias in flipping an actual coin, three truly random virtual coin flips (one for each course) were generated at http://www.random.org/coins (Haahr, 2010), using the definition that a result of "heads" meant that the lower section number of the course would have access to the recordings, and a result of "tails" meant that the higher section number would have access to the recordings. This particular website was chosen for the virtual coin flips because their underlying algorithm has been independently verified as random enough to meet National Institute of Standards and Technologies criteria for being truly random, not pseudorandom (Haahr, 2010). The results of the coin flips and the subsequent assignments of each section to either the treatment group (with access to recordings) or the control group are shown in Table 4.2.

Table 4.2: *Coin Flip Results*

CHIN012 - Beginning Modern Chinese II - Tails	
Section 003	Control
Section 004	Treatment
CHIN022 - Intensive Modern Chinese III & IV - Heads	
Section 001	Treatment
Section 002	Control
CHIN372 - Advanced Spoken Mandarin II - Tails	
Section 680	Control
Section 681	Treatment

To minimize the influence of a Hawthorne effect on the instructor, where

simply being involved in a research project makes teachers more motivated to do well (Cook, 1962), and thereby possibly teach the recorded classes differently than those which were not recorded, instructors were asked to record both sections of their classes, and were not told which section had been chosen at random to have access to the recordings for the semester. Students also were asked not to tell the instructor whether or not they were given access to the recordings, and to direct questions about accessing the recordings to the researcher instead of to the teacher.

At the end of the semester, instructors provided the researcher with the final grades for students in both sections of each course, and students completed a survey after the semester ended. The survey is described in more detail in the following section.

Treatment Procedure

The instructors recorded every class meeting, except during those times when an exam was being given, which would have just been a recording of silence. Once a week, on Fridays at lunchtime, when none of the classes were meeting, the recorders were collected from the instructors so that the recordings could be uploaded to a secure directory on media.sas. The uploads were done in the East Asian Languages and Civilizations Department office using the researcher's laptop, and the recorders were returned to the instructors' mailboxes in that office within half an hour. Although this upload took less than 10 minutes per course per week and is something that the instructors could have done for themselves without trouble, the researcher was sensitive to the heavy workload in the department due to staff shortages that semester, and offered to provide this service for them, which

also provided confirmation that the recordings were uploaded regularly. The recordings themselves were only for the use of the students, so they were not transcribed or even heard by the researcher or the instructors, except perhaps briefly to check that sound levels were adequate.

Materials

Consent

At the beginning of the semester, students in both the treatment and control sections of the courses were invited to participate in the study. They were required to complete an Informed Consent process to participate and to have their data considered as part of the results. The invitation to students to participate, which was sent via e-mail, is included in Appendix C, and the Information Sheet for informed consent, which appeared in a printable form online, in the secure Blackboard site, is shown in Appendix D. A total of 17 students, representing a few students in each section, declined to consent to have their data included in the study, so these students were not surveyed, and their grades were immediately filtered out of the information received from the instructors. The resulting totals of consenting and non-consenting students in each section are shown in Table 4.3. Although no reasons were given for their reluctance to consent, and all students were assured of the privacy of their data, it is possible that an increased awareness of the risks of identity theft led the students to be more conservative about granting consent for this study. Since more students in the Control sections of courses declined to provide consent than students in the Treatment sections, it is also possible that students didn't want to participate if they would not get any

benefit from the study, assuming that they thought that access to class recordings is a benefit. Nevertheless, it is impossible to determine whether this self-selection in deciding whether or not to consent to participate has biased the results, which must be considered in the final analysis.

Table 4.3: *Informed Consent Results*

Course-Section	Consenting	Non-consenting	Total
Treatment Groups			
CHIN012-004	14	1	15
CHIN022-001	8	1	9
CHIN372-681	15	1	16
	37 (92.5%)	3 (7.5%)	40
Control Groups			
CHIN012-003	13	4	17
CHIN022-002	13	7	20
CHIN372-680	12	3	15
	38 (73.1%)	14 (26.9%)	52
Total	75 (81.5%)	17 (18.5%)	92

Preliminary Interviews with Language Learners and Teachers

To construct the end-of-semester surveys administered to students in the study, lists of both indicators of achievement and uses for the recordings had to be compiled, so that these could be presented as multiple-choice questions in the final survey. To develop this list of specific behaviors and accomplishments, which would provide more concrete information than general opinion questions such as, "Did you learn more?", open-ended interviews were conducted with current graduate students in the graduate program in Education at the researcher's university and

current students in Chinese Language Programs courses at the researcher's university who were not part of the main study. After contacting 26 students in the Ph.D. program in Education, 115 students in the M.S.Ed. in Teaching English to Speakers of Other Languages program and 125 students in undergraduate Chinese courses and asking for volunteers to complete a short telephone interview, a total of 17 volunteers were found. All 17 volunteers were interviewed.

The telephone interviews were conducted at the respondents' convenience, mostly in the evenings, but also during the day and on weekends. Three of the respondents preferred to answer by e-mail, so they were given the same questions by email, and encouraged to list as many items as they could think of for each question. The interview questions were as follows, and interviewees were given as much time as they wanted to elaborate on each, with the researcher taking detailed notes at the same time:

- **What foreign languages have you studied?**

  This question was posed to open the conversation and to gain information to direct the rest of the interview. Interviewees who had studied Chinese were asked to think about that language in answering the following questions, while others were asked to think about the language that they had studied the most as a young adult. This was done to get information that would correspond to the research subjects as closely as possible.

- **How would you define your perceived achievement in that foreign language? In other words, what things did you learn to do in that language (pronounce, conjugate, understand when spoken, understand when read, write, differentiate, etc.) that made you**

feel that you had achieved something?

This question was posed to gather information to create the multiple-choice options for the survey question that asked research subjects what they perceived that they had achieved in the language course. This relates to "Are the reasons [for using recordings] related to their perceived achievement?" from RQ1b and "What is the relationship between the availability of classroom recordings and benefits of courses perceived by students?" from RQ2c.

- **How would you define your actual achievement in that language? This is different from your perceived achievement because "actual" means that it is something that a teacher or other evaluator would value. Is it everything you listed above, some but not all of it, or everything above plus more, or totally different things than you listed?**

  This was asked to elicit further items that the interviewees associated with achievement but which they might not have considered when answering the previous question. Again, the responses were used to create the multiple choice options for the survey question about students' perceived achievement, which related to parts of RQ1 and RQ2.

- **Imagine that you took a foreign language course where recordings were made of every meeting of the class, capturing all of the discussion in the room (from both the teacher and the students), and you had easy access to the recordings anytime during the**

semester. If each recording was posted within a few days after the class met, how do you think you might make use of the recordings? This question was used to develop the multiple-choice options for the survey question addressing RQ1b: "If [students use the classroom recordings], what are their reasons for using the recordings?"

- **Have you ever taught a foreign language?**
  This question was posed to determine whether the interviewee could provide further information about indicators of perceived achievement, relating to RQ1 and RQ2, as described above.

  Six of the 17 respondents said that they had taught a foreign language, so they were asked the following additional questions:

- **What languages have you taught?**
  Again, this was used to direct the following questions. If respondents had taught more than one language, they were asked to think about the language they have the most experience teaching.

- **When teaching this foreign language, what do you take into account when you give a student a grade?**
  This was used to elicit further possible indications of perceived achievement, which would be used to create the multiple-choice survey items addressing parts of RQ1 and RQ2 as described above.

- **How do you define achievement for your foreign language students? What specific things can they do in the language or**

accomplish with it?

Like the question above, this was posed to elicit any other indications of
perceived achievement that the interviewee may not have mentioned
previously, which would be used to address parts of RQ1 and RQ2.

The detailed notes from the interviews were compiled into a spreadsheet,
where similarities became apparent, with several respondents indicating, for
example, that they felt a sense of achievement from being able to hold
conversations with native speakers and express opinions in the language. From
these responses, a list of 30 indicators of achievement and 18 possible uses for the
recordings were compiled. These were used as the multiple-choice options for
questions in the survey, but an option for "Other" with space for an open-ended
response was added to each question, so that the respondents could include any
additional items that they felt were important.

Survey of Treatment Group

Using the multiple-choice questions created from information obtained in the
preliminary interviews, a post-semester survey was created and administered to
students in sections with access to the recordings, who were given a choice of
completing the survey either via e-mail or on the university's Blackboard
Courseware system. The layout was similar for both the e-mail and the
Blackboard versions of the survey, and is shown in Appendix E. The Blackboard
system requires students to log in to access materials for courses in which they are
enrolled, so students were only able to access the survey appropriate for their
section of the course, and responses were secure. If students wanted their
responses to remain anonymous, they were told that they could send their survey

responses via e-mail from a different e-mail address that did not reveal their name, but no students chose this option.

Most of the questions on the survey were multiple-choice, where students were asked to check off which of a list of items applied to them, with an "Other" option for additional items at the end of each question. Questions asked about the purposes for which the students used the recordings, ways in which the recordings helped them to learn Chinese, and how and where they listened to the recordings. In particular, questions 1, 2 and 3 of the survey relate to RQ1 (briefly: did they use the recordings? why?), while question 4 will be used to answer RQ2 (briefly: do students perceive that recordings lead to higher achievement?). Questions 5 through 9 sought background information such as whether students were reluctant to participate in class because it was being recorded and whether they had a background in Chinese language before studying it in school. Question 10 was an open-ended response question, where students could express opinions or provide comments not addressed elsewhere.

Survey of Control Group

For students in sections that did not have access to the recordings, a simpler survey with just the background information questions was constructed, as shown in Appendix F. Students in these sections also had the option of completing the survey via e-mail or on Blackboard, and could remain anonymous by sending survey responses from an anonymous e-mail address. Again, no students chose to remain anonymous. This background information was sought from the control group to determine whether there was any significant difference between the treatment and control groups in the percentage of students who may have had

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exposure to the language at home or who may have had negative reactions to the fact that the classes were being recorded. This is not intended to be a study of heritage language (HL) versus non-HL learning, and we must bear in mind the results of recent studies such as Lee's (2005), which show that "there are many learners who seem to possess characteristics of both heritage and non-heritage language for various reasons, which would not be captured if we were to only look at learner profiles in an either/or scenario" (Lee, 2005, p. 562). Consequently, we are not attempting to categorize students by their HL status, but simply are considering self-reported exposure to the language at home as one possible measure of the homogeneity of the groups.

Data Analysis

After survey responses were collected from the students and grades were received from the instructors, all of the data were stripped of identifying information and gathered in a NeoOffice 3.1.2 spreadsheet on the researcher's MacBook Pro, running Mac OS X version 10.5.8. To be able to associate a particular student's grades with his or her survey responses, each student was assigned a random participant code in the spreadsheet. Copies of the spreadsheet that included the identifying information were securely deleted, and only the participant-coded data was retained.

Since this is descriptive research into the role of the use of recordings as an intervention in foreign language classrooms, much of the data analysis will consist of descriptive statistics of the data gathered, as detailed in Table 4.4. For example, the first part of Research Questions 1 and 2 will be analyzed with percentages of responses:

- *(From RQ1a and RQ1b)* If classroom recordings are made available to students, do they use them? If so, what are their reasons for using the recordings?

- *(From RQ2a)* Do students perceive that the availability of classroom recordings leads to increased achievement?

Table 4.4: *Summary of Statistical Analyses of Data*

Research Question (briefly)	Dependent Variable	Data to be Analyzed	Statistical Analysis
1a. Do students use the recordings?	Students' use of the recordings	USE	Descriptive statistics
1b. Why?	Reasons for using recordings	REASONS	Descriptive statistics
2a. Do students think recordings lead to achievement?	Students' perceived achievement	ACHIEVE	Descriptive statistics
2b. Relationship between achievement and reasons?			Descriptive statistics
2c. Relationship between recordings and achievement?			Descriptive statistics
3a. Do recordings improve grades?	Students' actual achievement	GRADE	Paired Histograms; Mann-Whitney
3b. Relationship between use of recordings and grades?			Descriptive statistics

In this study, inferential statistics are appropriate only to analyze Research Question 3a, namely, "Does the availability of classroom recordings improve

student achievement, as measured by student grades from courses with and without access to recordings?" We first use paired histograms, a descriptive tool, to get a sense of the distribution of the data for this Research Question. When we go on to the inferential statistics, we cannot use the familiar *t*-test, however, because letter grades are not an equal interval scale, which is required to obtain valid results from this test (Lowry, 2011). Instead, we use the Mann-Whitney Test, a non-parametric test which also allows us to avoid the question of whether students' grades are normally distributed or skewed, since average college GPAs are now at 3.0 or higher on a 4-point scale, (Rojstaczer, 2009) and we are likely to see distributions that are skewed toward higher grades. Mann-Whitney Tests are computed using Wolfram Mathematica 8.0, also on the researcher's MacBook Pro.

Because each of the three courses in the study covers a different level of Chinese, it may not be appropriate to perform analyses involving grades on the aggregate data from all of the students in all of the courses. Combining the grade data may lead to questions about inter-rater reliability, which could not be tested in this real-course setting. Instead, we consider each course separately, and provide combined results only where appropriate.

Chapter 5

Results

This chapter describes the results of the statistical analyses that were conducted after all of the data from the Treatment and Control sections of the three courses were gathered, coded and checked. We will consider each part of the Research Questions in turn, presenting the appropriate statistical analysis for each item, as described in Chapter 4.

Results for Research Question 1

RQ1a: If classroom recordings are made available to students, do they use them?

In the three Treatment sections as a whole, as well as in each section individually, a majority of students used at least one of the recordings that were made available. As the detailed results in Table 5.1 show, more than half of the students (59.4%) reported using two to five of the recordings, but no one reported using every recording.

Table 5.1: *Students' Reported USE of the Recordings*

| How many of the recordings did you use? | | | | | |
None	One	Two or Three	Four or Five	More than Five, but not all	All of Them
CHIN012-004 - Beginning Modern Chinese II *(n=14)*					
3	2	1	6	2	0
CHIN022-001 - Intensive Modern Chinese III & IV *(n=8)*					
1	0	4	1	2	0
CHIN372-681 - Advanced Spoken Mandarin II *(n=15)*					
2	3	5	5	0	0
TOTAL 6	5	10	12	4	0
(16.2%)	(13.5%)	(27.0%)	(32.4%)	(10.8%)	(0.0%)

For students who did not use the recordings, we wanted to understand whether this was because of preference or technical problems, so the second question of the survey was "If you didn't use the recordings, why not? Check all that apply." This was a multiple-choice question with the option to use a free-response text area to specify another reason for not using the recordings. No one used this text area, but each of the six students who reported using "None" of the recordings did reply to this question, and 4 of the 6 students selected more than one of the possible responses. Detailed results for this question are shown in Table 5.2. None of the students chose "It was too difficult to access the recordings," so we have confidence that the technology was not a barrier to students' use of the recordings. One student did choose, "I did not know the recordings were available," so there was some sort of breakdown in communications, even though that student did complete the Informed Consent. This may have happened because the instructor was not told which class would have access to the recordings, so the instructor was not able to remind the

students about the recordings. The student who reported not knowing about the recordings did earn a good grade in the class (A-), so we can assume that he or she was otherwise aware of class information and assignments. In an ordinary setting, without the secrecy imposed by this research, the web address for the recordings would probably be posted on the syllabus or otherwise made obvious to the students, so this would not be a problem.

Table 5.2: *Students' Reasons for Not Using the Recordings*

If you didn't use the recordings, why not? Check all that apply. *(n=6)*		
I did not know the recordings were available	1	16.7%
It was too difficult to access the recordings	0	0%
I did not have time to use recordings because of other commitments	4	66.7%
I did not spend time using recordings because they were not required for class	3	50%
I did not have any particular problem with the course, which would be the only reason I would ever use the recordings	4	66.7%

RQ1b: If so, what are their reasons for using the recordings?

Among the 18 different REASONS for using the recordings presented in Question 3 of the survey, all were selected at least once by students, but only four were selected by 50% or more of the students. Table 5.3 shows the results of this question, sorted in order of decreasing percentage of responses. This shows that the most common reasons for using the recordings were to review for the final exam or a test, followed closely by using them to listen to a class that was missed.

Other common reasons for using the recordings included listening for something that the student didn't quite hear or understand in class, and using the recordings as an example to improve articulation or pronunciation.

Table 5.3: *Students' REASONS for Using the Recordings*

Why did you use the recordings?	Count	Percent
Review for final	24	77.4%
Review for test	21	67.7%
Missed class	18	58.1%
Didn't catch something	16	51.6%
Improve articulation	13	41.9%
Mimic Teacher's pronunciation	12	38.7%
General review	11	35.5%
Mimic Teacher's grammar	9	29.0%
Improve my word choice	9	29.0%
Improve prosody	9	29.0%
Memorize Teacher's sentences	8	25.8%
New words and idioms	7	22.6%
Review instructions	6	19.4%
Repeat oral exercises	6	19.4%
Predict Teacher's questions	4	12.9%
Find own weaknesses	2	6.5%
Didn't take notes fast enough	1	3.2%
Gauge self against class	1	3.2%

Note. n=31. Percentages total >100% because multiple responses were allowed. See Appendix E for full text of choices.

These results indicate that the recordings were helpful to students who unavoidably missed a class, echoing earlier results from the pilot test by Scheyder and MacDermott (2007). Primarily, however, students used the recordings to review class material, either in preparation for a test or the final exam. This indicates that the students did use them as an additional resource for achievement, and as results later in this chapter will show, these uses of the recordings can be associated with higher actual achievement, as measured by students' grades.

Next, we consider whether students' REASONS for using the recordings are related to their GRADES, and how this may be affected by the number of times they USEd the recordings. To do this, Tables 5.4 through 5.7 show the number of students who earned each GRADE for a given number of times that they USEd the recordings. For comparison, we also include data for the GRADES of all students who did not USE the recordings, including both the Control sections and the students in the Treatment sections who reported never using the recordings.

From Table 5.4, we can see that, among students whose REASON for using the recordings was to study for a final exam, the mean GRADE of students who USEd "4 or 5" of the recordings was higher than the mean GRADE of students who reported using "2 or 3" of them, and both were higher than the mean GRADE of students who did not USE any the recordings. The same is true in Table 5.5 for students who reported using the recordings to study for a test. Because very few students reported using "More than 5 but not all" of the recordings, there were not really enough data points to calculate a reliable mean GRADE.

Table 5.4: *GRADES vs. USE for "Study for Final" as a REASON*

| | GRADES *(n=24)* | | | | | | | | |
	D+	*C*	*C+*	*B-*	*B*	*B+*	*A-*	*A*	Mean
> 5 but not all						1	1	1	3.57
Four or five							1	8	3.97
Two or three							3	6	3.9
One								3	4.0
None	1	2	1	1	4	4	15	28	3.63

Table 5.5: *GRADES vs. USE for "Study for Test" as a REASON*

| | GRADES *(n=21)* | | | | | | | | |
	D+	C	C+	B-	B	B+	A-	A	Mean
> 5 but not all					1		1		3.35
Four or five							1	8	3.97
Two or three							2	6	3.93
One								2	4.0
None	1	2	1	1	4	4	15	28	3.63

Table 5.6: *GRADES vs. USE for "Missed Class" as a REASON*

| | GRADES *(n=18)* | | | | | | | | |
	D+	C	C+	B-	B	B+	A-	A	Mean
> 5 but not all							1	2	3.90
Four or five			1				1	4	3.67
Two or three							3	5	3.89
One								1	4.0
None	1	2	1	1	4	4	15	28	3.63

Table 5.7: *GRADES vs. USE for "Didn't Catch Something" as a REASON*

| | GRADES *(n=26)* | | | | | | | | |
	D+	C	C+	B-	B	B+	A-	A	Mean
> 5 but not all								2	4.0
Four or five			1					4	3.66
Two or three							2	5	3.91
One								2	4.0
None	1	2	1	1	4	4	15	28	3.63

Results for Research Question 2

RQ2a: Do students perceive that the availability of classroom recordings leads to increased achievement?

Research Question 2a involves students' perceptions of their achievement in their Chinese class, as measured by their responses to a survey question that asked them to mark the ways in which they thought that the availability of the recordings helped them. As described previously, the possibilities for ways in which the recordings helped were developed from interviews with language teachers and learners, so that a simple multiple choice question could be used. Among these 31 possible aids to achievement provided by the recordings, 27 were selected at least once by students, but only three were selected by 50% or more of the students. None of the students chose to enter text in the space for "other" ways that the recordings helped. Table 5.8 shows the results of this question, sorted in order of decreasing percentage of responses. These results show that the most-cited help provided by the recordings was in the students' ability to distinguish between tones and pronounce different tones, followed closely by recognizing grammatical forms and speaking at a relatively fluent pace.

Table 5.8: *Ways that students thought the recordings helped them*

How do you think the recordings helped you? Check all that apply.	Count	Percent
Distinguish between tones	23	74%
Pronounce different tones	17	55%
Recognize grammatical forms	16	52%
Speak at a relatively fluent pace	15	48%
Make my pronunciation close to native	12	39%
Make myself understood to others	11	36%
Increase my vocabulary in Chinese	9	29%
Understand and use idioms in Chinese	8	26%
Understand the majority of conversations	7	23%
Put together novel sentences	7	23%
Write grammatically correct sentences	7	23%
Express and understand opinions	6	19%
Be 'me' in Chinese	6	19%
Read and understand common texts	5	16%
Introduce myself in Chinese	5	16%
Understand what I hear on TV	4	13%
Translate a Chinese text	4	13%
Learn enough to help if I were lost	4	13%
Understand humor in conversations	3	10%
Read Chinese characters	3	10%
Conjugate verbs	3	10%
Have conversations about complex topics	3	10%
Make jokes in conversation in Chinese	2	6%
Learn to write Chinese characters legibly	2	6%
Read and understand literature	1	3%
Understand humor in texts	1	3%
Write full paragraphs and essays	1	3%
Learn about the culture	0	0%
Write real letters	0	0%
Write creatively (such as poems)	0	0%
Other ways recordings helped (specify)	0	0%

Note. n=31. Percentages total >100% because multiple responses were allowed. See Appendix E for full text of choices.

RQ2b: Are the perceived benefits of using the recordings related to the students' reasons for using them?

To consider whether what students felt the recordings helped them ACHIEVE is related to their REASONS for using the recordings, we will look at the 5 most frequent choices for ACHIEVE, and the percentage of students who selected that measure of achievement who also selected each REASON for using the recordings. This shown in Table 5.9. For example, of the students who said that the recordings helped them pronounce different tones understandably, 94% also selected "Review for final" as a REASON for using the recording. This was the most frequent REASON for using recordings among all of those chosen by students who said that the recordings helped them pronounce different tones understandably. In contrast, among the students who said that the recordings helped them pronounce different tones understandably, none said that they used the recordings for finding where they needed to improve, making up for where they didn't taken notes fast enough, or gauging their own learning against class members' learning.

ACHIEVE (How do you think the recordings helped you?)					
REASON	Distinguish btwn. tones n=23	Pronounce understandably[a] n=17	Recognize grammar[b] n=16	Speak at fluent pace[c] n=15	Close to native[d] n=12
Review for final	83%	94%	75%	67%	67%
Review for test	70%	71%	69%	60%	67%
Missed class	56%	65%	44%	60%	50%
Didn't catch something	48%	59%	44%	40%	58%
Improve articulation	48%	53%	56%	47%	50%
Mimic Teacher's pronunciation	48%	41%	50%	53%	58%
General review	44%	41%	25%	40%	42%
Mimic Teacher's grammar	30%	29%	25%	46%	42%
Improve word choice, grammar	22%	24%	25%	27%	8%
Improve prosody	35%	35%	44%	27%	58%
Memorize Teacher's sentences	26%	35%	25%	33%	25%
Listen for new words & idioms	26%	24%	31%	20%	42%
Review instructions	22%	29%	19%	20%	33%
Repeat oral exercises	22%	24%	19%	13%	33%
Predict Teacher's questions	13%	12%	19%	13%	33%
Find where I need to improve	0%	0%	6%	7%	8%
Didn't take notes fast enough	4%	0%	0%	7%	8%
Gauge my learning vs. class	0%	0%	6%	7%	8%

Notes. Total n=31. See Appendix E for full text of choices for reasons.
[a] Pronounce different tones understandably
[b] Recognize grammatical forms
[c] Speak at a relatively fluent pace
[d] Make my pronunciation close to native speakers'

RQ2c: What is the relationship between the availability of classroom recordings and benefits of courses perceived by students?

To analyze this question, the students' self-reported data on how many recordings they used was tabulated against each of the 5 most frequent choices for ACHIEVE, which were the same as those used in the previous table. The results are shown in Table 5.10, where we can see, for example, that 39% of the students who said that the recordings helped them to distinguish between tones also said that they used the recordings "Four or Five" times. Students who reported using none of the recordings were not included in this analysis, since they did not have any responses for how they thought the recordings helped them. Further, no student reported using all of the recordings, so this column was omitted from the table.

Table 5.10: *Frequency of USE of recordings in relation to measures of ACHIEVE*

USE (How many of the class recordings did you use?)				
	One	Two or Three	Four or Five	More than Five, not all
Distinguish btwn. tones[b]	9%	35%	39%	17%
Pronounce understandably[c]	12%	35%	35%	18%
Recognize grammar[d]	19%	31%	31%	19%
Speak at fluent pace[e]	7%	40%	47%	7%
Close to native[f]	17%	42%	25%	17%

Notes. Total n=31.
[a] How do you think the recordings helped you?
[b] Distinguish between tones *n=23*
[c] Pronounce different tones understandably *n=17*
[d] Recognize grammatical forms *n=16*
[e] Speak at a relatively fluent pace *n=15*
[f] Make my pronunciation close to native speakers' *n=12*

Results for Research Question 3

RQ3a: Does the availability of classroom recordings improve student achievement, as measured by student grades from courses with and without access to recordings?

We must note at this point that one student in CHIN012-003, the Control section of Beginning Modern Chinese II, failed the course. This student's grade was dropped from all calculations involving grades because it was an outlier, as the only failing grade among all 75 students who consented to participate. Additionally, a grade of F is assigned 0 points, but we cannot say that the student necessarily learned absolutely nothing in the course, so including this student's grade would skew the results.

We will begin to address Research Question 3a by using Mathematica to create paired histograms to get a sense of the distributions of GRADES in each of the classes, comparing the Control section to the Treatment section for each class. These paired histograms are shown Figure 5.1.

The histograms show us that the "mass" of grades were higher in the Treatment section of each course than they were in the Control section of the course, giving us a visual indication that the recordings increased student achievement as measured by GRADES. While this does not tell us whether the effects are statistically significant or not, it does tell us that any effect that was present was positive.

We also can see from the histograms that the grades in each of the sections are not necessarily normally distributed and the grades are not an equal-interval scale, with the interval between a $C+$ and a $B-$, for example, which are 2.3 and
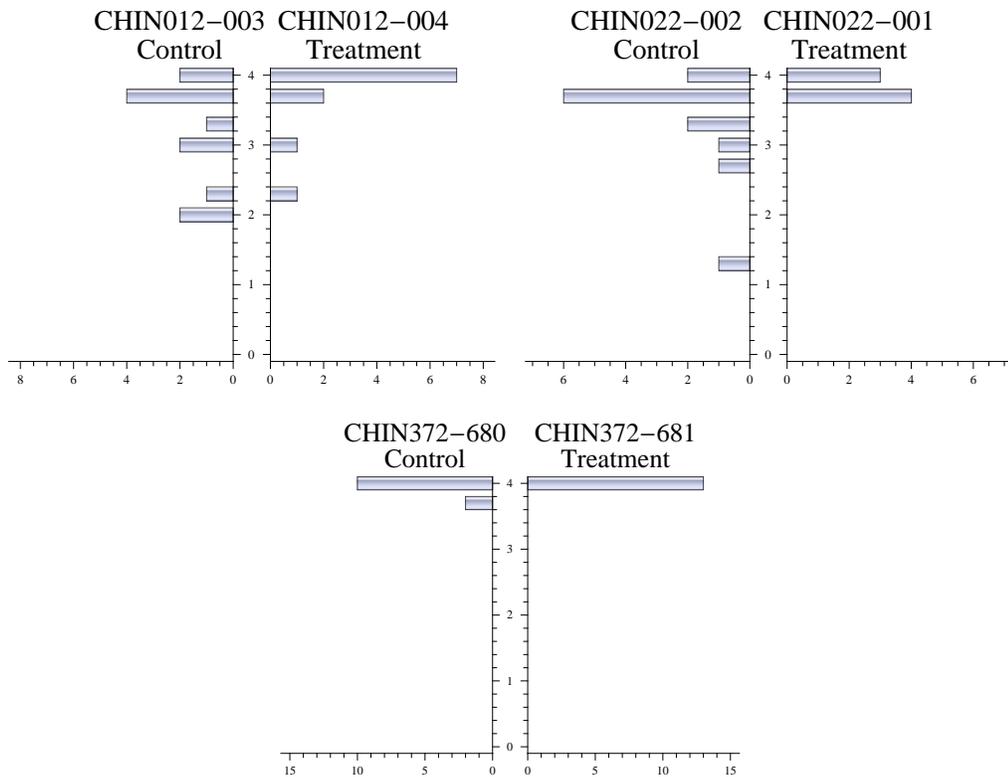
Figure 5.1: Paired histograms showing distributions of GRADES

2.7 on a numerical scale, respectively, being 0.4, which is greater than the interval of 0.3 between a $B-$ and a B, which are 2.7 and 3.0, respectively. This confirms our decision to use the Mann-Whitney Test instead of the more familiar t-test.

This Research Question also allows us to employ inferential statistics to examine whether or not the Treatment, i.e., the availability of classroom recordings, is helpful to students in achieving higher GRADES. As discussed in the Data Analysis section of Chapter 4, we used the Mann-Whitney Test since GRADES are not necessarily an equal-interval scale, and since they may not be normally distributed. Because each of the three courses is different, we performed the Mann-Whitney Test on each class individually, comparing the Treatment section to the Control section. The results are shown in Table 5.11.

Table 5.11: *Results of Mann-Whitney U Test, Directional*

		n	Median	Mean Rank	U	E_{MW}	p
CHIN012	Control	12	3.5	9.2	99.5	0.75	0.021
	Treatment	11	4.0	15.1	32.5		
CHIN022	Control	13	3.7	8.8	68.0	0.75	0.041
	Treatment	7	3.7	13.7	23.0		
CHIN372	Control	12	4.0	11.9	91.0	0.58	0.248*
	Treatment	13	4.0	14.0	65.0		

* not significant at $p < .05$

Although not part of the Mann-Whitney test, it is convenient to calculate the mean rank of GRADES as part of this process. The grades of both the Treatment and Control sections of a given course are combined and then are ranked from lowest to highest, so if a treatment increases students' grades, we would expect the mean rank of the Treatment group's grades to be higher than the mean rank of the Control group's grades. As we can see from Table 5.11, the mean rank for each Treatment group was higher than the mean rank of the corresponding Control group, so we can conclude that any effect on GRADES from the Treatment was a positive one.

Once again, the data from CHIN372 (Advanced Spoken Mandarin II) did not show any significant effect from the availability of the recordings, in part because there was such a narrow range of variation among the grades in both of the sections of the course. Of the 25 students participating in this study in both sections of CHIN372, only two received a grade of $A-$ for the course, while all of

the rest received a grade of A. Although the grades from the Treatment section of this course had a slightly higher mean rank than the grades from the Control section, indicating that the grades were slightly better for the Treatment group, this statistic had $p = .248$, which is far from being significant at the established $p < .05$ level.

The data from the other classes did show a significant improvement in student achievement as measured by their grades from the availability of the recordings, with $p < .05$ for each of the classes. Mathematica also provides an Effect Size, E_{MW}, with Mann-Whitney calculations, which is calculated as

$$E_{MW} = \frac{U_{max}}{n_1 n_2}.$$
(5.1)

Note that this formula for Effect Size is not universal, and is not calculated in the current version of SPSS, but it is receiving increasing use after research articles such as Newcombe (2006) have appeared espousing it. The CHIN012 and CHIN022 classes both showed rather large effect sizes, 0.75 in each case.

RQ3b: What is the relationship between students' use of the recordings and their actual achievement in their courses?

Since the question about how many recordings were used asked students to select from categories such as "One" and "Two or Three", these responses were translated into concrete numbers to use to analyze this research question. In this case, "Two or Three" was recorded as 2.5, "Four or Five" was recorded as 4.5, and "More than Five, but not all of them" was recorded as 6. None of the students reported using all of the recordings, so decimalizing this was not an issue. Using these values, Pearson's product moment correlation coefficient, r, of USE in relation to the students' GRADES was calculated for each class with access to the recordings. As discussed previously, there was no variance in the grades for the students in CHIN372, so the r could not be calculated for this class. For the other classes, Figure 5.3 shows a scatter plot comparing students' GRADES to the number of times they USEd the recordings, as well as the r of GRADES contributed by USE of the recordings for each class.
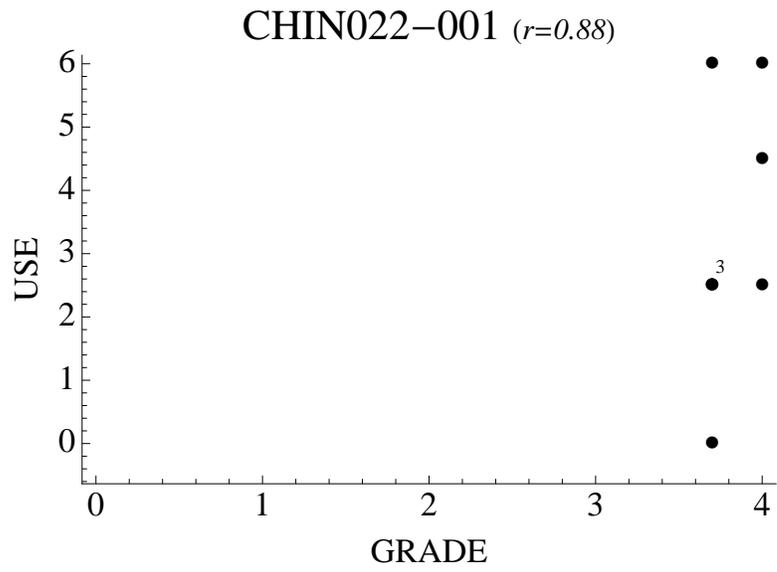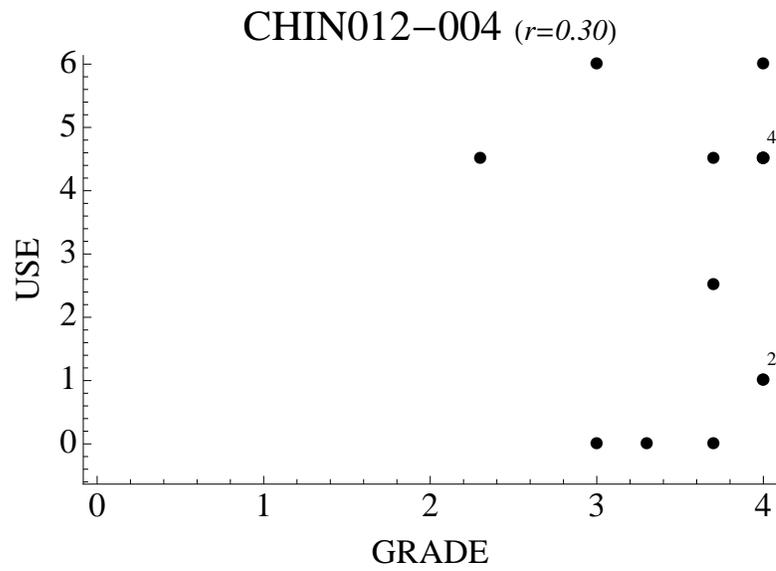
Figure 5.2: Scatter Plots showing USE vs. GRADES

Chapter 6

Discussion

This was a study of descriptive research performed in actual critical language classes at the researcher's university, not in experimental classrooms, and grounded in the role of intervention in language learning. It has sought to determine whether a low-cost intervention might contribute to student achievement. We must bear in mind that this study was limited to courses in Chinese, and although this makes the results interesting for other critical foreign languages, the language teaching methodology used in Chinese language classes at the researcher's university may not be the same as that used elsewhere, and it may not be used in teaching other critical languages. In particular, this Chinese language program has three genres of teaching (C. Frei, personal communication, February 2, 2011):

- lecture class with master teacher who does all modeling
- audio-lingual method with listen-and-repeat and quick recasting
- explanation of grammar

According to the instructors, the classes involved in this research all used the lecture class and the audio-lingual method at various times during the semester.

Further, our use of two sections of the same class taught in the same way by the same instructor ensures that our comparisons within courses are of similar genres, and the commonality of approach by the two different instructors gives us confidence that our multi-class comparisons are valid. As discussed in the Methodology section above, we have reason to believe that the students participating in the study are homogenous, and that no significant differences exist between students getting different grades. On the other hand, the students in this study were mostly likely to be 18 to 23 years old, and were all under 30 years old, so the results of this study may not be applicable to groups of students who are significantly younger or older than this group.

If the students were not so homogeneous, then the methods used to address this study's Research Questions would have had to divide the students into groups by their defining characteristics, such as age. A study designed with different demographic groups might have required more participants to adequately represent the different groups, but it might provide information on ways that different groups use classroom recordings or benefit from them in either students' perceived achievements or in their actual achievements, as measured by grades.

Although we have reason to believe that these students are homogeneous, they are also students at a highly selective private university that is consistently ranked among the top 10 universities in the United States. (U. S. News & World Report, 2011) As such, they may be more competitive students than those at other universities, or they may be more inclined to use any tool that they believe might help them achieve better grades. Since the results of this study indicate that recordings can help students achieve higher grades, the use of recordings may become very popular with students if this result becomes known and is confirmed

by other studies.

Among the students who did use the recordings, every student selected at least two of the choices for "How do you think the recordings helped you?", with an average of 6 items checked. This indicates that the students felt that the recordings helped them in several ways, with 74% of students saying that the recordings helped them distinguish between tones, and 55% saying that the recordings helped them pronounce different tones. Recognizing grammatical forms was also reported as a benefit of using the recordings by 52% of the students.

We should note that no student cited getting a better grade in the course as a benefit of using the recordings. This was not one of the multiple-choice items on the survey, and it was not cited in the text responses for "other reasons" by any of the students. The fact that it was not on the survey may be a result of the way the preliminary informants were prompted to create the multiple-choice items. Nevertheless, it would be good to include it on the survey for any future replication of this research, to see whether students believe that the recordings help them get better grades, since this research indicates that the use of recordings is associated with better grades.

We also must keep in mind that Chinese is a tonal language, so changing the pitch of a syllable, for example changing from a rising tone to falling tone, can change the meaning of a word. Since students most frequently cited tonal issues as areas where the recordings were helpful, this might imply that classroom recordings are particularly helpful in in the second language acquisition of Chinese and other tonal languages, because the recordings capture the intonation of words. More research may be needed to determine whether recordings are equally helpful in the acquisition of non-tonal languages, and to see whether these results can be

generalized to the other super-critical foreign languages, which are not tonal. Given the benefits that students cited from using the recordings, however, we can conclude that the students thought the recordings were helpful for increasing their achievement in Chinese, and would welcome their inclusion in other classes.

The strongest results of this research are that two out of three classes showed a significant benefit to students, in the form of improved grades, from the availability of classroom recordings, and only one of the three classes had no statistically significant difference in grades between the recorded and un-recorded sections. We have shown that 86.5% of students used the recordings that were made available, and that 59.5% of students used at least two to five of the recordings. The main reasons that students cited for using recordings involved reviewing for final exams or tests, or making up for a missed class. It can be argued that a student who has missed a class has received less input in the foreign language, so the availability of recordings may help that student to recover the lost input so that he or she has received as much input as his or her classmates. It is important for students to recover this input, and repeating input by listening to classes that they attended may be an important form of practice for FL students, since, as VanPatten (2004) puts it, "the fundamental source of linguistic data for acquisition is the input the learner receives." (p. 6)

If instructors had known which of their classes would have access to the recordings, they might encourage students to use them, or they might even build exercises or assignments around the recordings, any of which would increase the use of the recordings and might have a positive impact on student achievement as measured by grades. We found that two out of the three Treatment sections showed a Mann-Whitney Effect Size of 0.75 on their GRADES compared to the

corresponding Control sections of the courses. This indicates that additional use of the recordings may provide additional benefits to students' GRADES.

The positive results listed above provide evidence that classroom recordings have a positive impact on student achievement in Chinese, which is a critical foreign language. More research is warranted, to confirm these findings and to see if the findings apply to Chinese language classes taught elsewhere or with different methods. For example, simply replicating this research in Chinese language classes with larger numbers of students, either at another university or in a multi-site study, would be useful to confirm the results. Further, the benefits of classroom recordings could be more precisely identified if students were given an Online Placement Indicator both before and after the semester. This was not done for this study because the intent was to disrupt the normal semester as little as possible, so adding additional testing was not feasible, but it would be relatively easy to incorporate into future studies, and it would be especially helpful in quantifying the benefits of recordings for larger numbers of students.

As an agenda for future research, case studies using the same research design for Arabic and other critical foreign languages would help to determine whether recordings are a useful tool for all critical languages, or just for Chinese. This would be helpful for government agencies and non-governmental organizations that are working on solving the problem of critically needed foreign languages. Alternatively, the research could contrast the use of recordings as a tool for achievement in tonal versus non-tonal languages, whether or not they are critical foreign languages. Including more commonly taught languages would make it easier to find one teacher with two or more sections of the same course in a given semester.

LMSs such as Blackboard and Sakai are becoming ubiquitous in higher education, and posting the links to the recordings of classes in the LMS would integrate them into the course material more closely than could be done in this research. Instructors may even make use of the recordings by designing assignments around them, such as transcription work or having students listen for errors and correct them. Focusing more of the course content on the recordings may serve to increase the benefits that students see from them. In a similar vein, online classes are becoming mainstream, and foreign language courses are beginning to enter this medium. If online classes are recorded and students have access to the recordings later, then this would eliminate the need to do any extra work to create and post the recording. Since the results of this research are promising for the use of recordings in foreign language classes, that would seem to be an argument in favor of the benefits of online foreign language classes.

Students like having access to classroom recordings, and because the treatment described in this research is inexpensive, both in material costs and in teacher time, the barriers to expanding the use of recordings are very low. This gives us good reason to believe that recordings may be more widely used in the near future. If this happens, then recordings could help an even wider array of language students, whether in Chinese, another critical foreign language or any other foreign language, to succeed in their studies.

Appendix A: Portable Recorder Instructions

USING THE EDIROL R-09HR PORTABLE RECORDER
for Elizabeth Scheyder's Research Project

Recording your class

- Place the recorder in the middle of the seminar table, as close to the center of the group as possible. The microphone is omni-directional, so it doesn't have to be pointed at the person who is speaking.
- Turn the R-09s power on by pressing the Power button on the side and holding it for a moment
- Press the oval "REC" button once the button blinks, indicating that it is ready
- Press the oval "REC" button again the button lights up (steady) and recording begins
- If you take a break during class, press the Play/Pause button (▶/‖) . The "REC" button will begin to blink again. Press the Play/Pause button again when you are ready to resume recording.
- Press the Stop button (■) at the end of class. This stops the recording and closes the file. The next time you begin to record, it will start a new file.

Uploading the files

- I will arrange to pick up the recorder from your mailbox once a week and post the recordings on the web, then return the recorder to your mailbox an hour or two later.
- Only ONE of your classes will actually have the recordings posted, but I won't tell you which one, so that there is no "Hawthorne effect", where you behave differently because you know you're being recorded. This way, you won't know which recordings will be posted and which won't.

Replacing the batteries

- Batteries should last for about 4 hours of recording, but watch the power level monitor and change them as often as necessary. I will check and replace the batteries when I borrow the recorder from you to upload the recordings, but some spare batteries are included in case you run out in the middle of a week.
- The batteries are under the battery door on the back of the unit, where the USB connector is. The door just un-snaps, but be careful not to lose it!
- To close the door, just snap it back in place.

Appendix B: Invitation to Instructors

After I received permission from the Coordinator, the following e-mail was sent to each instructor, with his or her particular courses substituted in the text:

Dear ———,

I would like to ask for your participation in my dissertation research this semester. If you don't already know me, I've worked for SAS Computing for more than 10 years, but I'm also using my **** tuition benefits to pursue a PhD in Educational Linguistics in the Graduate School of Education under Dr. Tere Pica.

Because you are teaching two sections of CHINxxx this semester, your participation would be very helpful. I would like to ask you to record all of your classes on a small portable audio recorder that I will provide. I'm asking you to record both sections of your course to avoid the possibility of a Hawthorne effect, where the teacher improves his or her performance because a recording is being made. All recordings will be posted to the internet every week in separate, secure directories for each particular class, but only one of each teacher's classes will be given access to the recording, and the teacher won't be told which class can hear the recordings.

Normally, I would ask you to post the recordings to the web yourself. However, your department's Language Coordinator has told me that everyone is teaching an extra-heavy load this semester. If you would be willing to participate, but don't have the time to upload the recordings, I will be happy to do this part for you. I don't want the research to be burdensome for you, and I don't want the prospect of a burden to cause you to decline to help me. I could easily pick up the recorder from your department mailbox every Friday, upload the recordings, and put the recorder back in your mailbox later that day, so you have it for Monday morning.

The data collected will be the grades for the students on their assignments and tests, a survey of the students at the end of the course, and interviews with the instructors and a few of the students. I plan to evaluate the effectiveness of making recordings of class discussions available to students studying a critical foreign language to see if this easy and inexpensive treatment makes it easier for them to learn the foreign language. I have chosen foreign languages that have been identified as "critical" by the government because this is where such treatments would be most valued. Chinese is the only such language at ****

where enough sections of the same course are offered in a semester to make a study practical. This is an inexpensive technology, and if it provides even a little help in learning the language, it may be worthwhile. (By the way, in my "day job" in SAS, we've used these recorders for a few years, and they have proved to be easy to use, so I don't anticipate that the technology will be burdensome for the instructor.) ********, ******** and ******** *(actual names obscured for privacy in this document)* were very gracious about helping me with a pilot test of this concept in 2007, which showed that the methods are practical.

Having a variety of instructors participate is critical to the success of my research, so I do hope that you will be willing to work with me on this! If you have any questions, I'll be happy to answer them, either by e-mail, by phone or in person.

Sincerely,
Elizabeth Scheyder

Appendix C: Invitation to Students

Dear Students,

For this course, we will be using a portable audio recorder to capture discussion from around the classroom.

- For some sections of this course, we will be posting the recording in a secure directory on the web for you to access any time
- Other sections of the same course will be recorded, but the recordings will not be posted on the web. This is so the instructor will not know which recordings are posted and which are not, so she or he does not teach any differently because a recording is being made.

ONE of the following two sections of text, as appropriate:

[You are in a course section that has been randomly selected to NOT have the class recordings posted on the web. I would still like to solicit your participation in the research so that I may compare your class's aggregate test scores to the aggregate test scores in sections that do have access to recordings.]

[You can access the recordings for your course at http://media.sas... *(complete URL appropriate for this class).* You will have to log in with your (user ID) and password to access the recordings, which are only available to students who are registered for this section of the course. I would like to solicit your participation in the research so that I may compare your class's aggregate test scores to the aggregate test scores in sections that do not have access to recordings.]

Please log into Blackboard at ********** and go to _____ to complete the Informed Consent if you are willing to participate in my research. If you have any questions about this research or problems with the recordings, please contact me at ****@*****.edu or **-***-**** *(actual contact information obscured for privacy in this document).*

Appendix D: Information Sheet

University of ****
Information Sheet**

Title of the Research Study:
The Impact of Recordings on Student Achievement in Critical Language Courses
Protocol Number: 811232
Principal Investigator: Elizabeth C. Scheyder
3600 Market St., Suite 510A
Philadelphia, PA 19104-2649
-*-**** / *****@*****.edu
(actual contact information obscured for privacy in this document)
Co-investigator / **Faculty Sponsor:** Dr. Teresa Pica
3700 Walnut Street
Philadelphia, PA 19104-6216
-*-**** / *****@*****.edu
Emergency Contact: Elizabeth C. Scheyder
3600 Market St., Suite 510A
Philadelphia, PA 19104-2649
-*-**** / *****@*****.edu

You are being asked to take part in a research study. This is not a form of treatment or therapy. It is not supposed to detect a disease or find something wrong. Your participation is voluntary which means you can choose whether or not to participate. If you decide to participate or not to participate there will be no loss of benefits to which you are otherwise entitled. Before you make a decision you will need to know the purpose of the study, the possible risks and benefits of being in the study and what you will have to do if decide to participate. The research team is going to talk with you about the study and give you this consent document to read. You do not have to make a decision now; you can print the consent document, take it home and share it with friends, family doctor and family.

If you do not understand what you are reading, do not sign it. Please ask the researcher to explain anything you do not understand, including any language contained in this form. If you decide to participate, you will be asked to sign this form and a copy will be given to you. Keep this form, in it you will find contact information and answers

to questions about the study. You may ask to have this form read to you.

What is the purpose of this study?
The purpose of the study is to see if having a recording of class discussions available makes it easier for students to learn a foreign language. This study is being conducted as part of Elizabeth Scheyder's PhD dissertation research in the Educational Linguistics Department at *****'s Graduate School of Education.

Why was I asked to participate in the study?
You are being asked to join this study because you are enrolled in or instruct a foreign language class where the same instructor is teaching two sections of the same course. One section will be randomly selected to have access to the recordings of that section, but the other section will not have access to recordings. Other than that, there will be no difference between the two sections of the course.

How long will I be in the study? How many other people will be in the study?
The study will take place over a period of one semester – the current semester at *****. You will be one of about 90 people in the study.

Where will the study take place?
If you are in a course section that is randomly selected to have access to the recordings, you will be able to download those recordings on any computer and listen to them on a computer or on a portable audio device. You will be able to complete the survey from any computer with internet access, using an ordinary web browser, just as you do for accessing your class's regular Blackboard site. You will not have to participate in-person for this study.

What will I be asked to do?

- If you are in a class that is randomly selected to have access to the recordings, you will have the option to listen to those recordings whenever you want.
- The researcher will compare the aggregate grades of classes that were given access to recordings to aggregate grades of classes that were not given access to recordings. No individual student grades will be part of the study, and no single student will have his or her grades reported in any write-up of the results.
- At the end of the semester, you will be asked to answer a few survey questions. This survey should take about 10 minutes to complete and will be conducted online, in Blackboard, so that it is secure and anonymous.
- At the end of the semester, you will also be asked if you would like to participate in a brief interview with the researcher, to answer additional questions or provide additional feedback to her. The interview would take about 15 minutes, and would be conducted somewhere centrally located on campus at your convenience. This is optional, and you can still participate in the research if you choose not to be interviewed in person.

What are the risks?
There are no anticipated risks that are directly associated with this research.
Since all of the student grades are stored on Blackboard, and since the survey will be conducted online in Blackboard, the only risks of a breach in confidentiality are those inherent in Blackboard itself, which have been evaluated by the University and deemed to be very low. If such a breach of confidentiality were to occur, it would potentially impact all students at *****, not just students participating in this research, and it could cause possible public embarrassment to them.

How will I benefit from the study?
There is no benefit to you. However, your participation could help us understand how recordings help students learn a foreign language, which can benefit you indirectly. In the future, this may help other people to learn foreign languages.

What other choices do I have?
Your alternative to being in the study is to not be in the study and simply not complete the survey at the end of the class, and not have your grades included in the aggregate scores that are part of the data.

What happens if I do not choose to join the research study?
You may choose to join the study or you may choose not to join the study. Your participation is voluntary. There is no penalty if you choose not to join the research study. You will lose no benefits or advantages that are now coming to you, or would come to you in the future. Your instructor will not be informed of your decision, so she or he will not be upset with your decision. If you are currently receiving any services and you choose not to volunteer in the research study, your services will continue. All of the student-support services at ***** will continue to be available to you whether or not you participate in this study.

When is the study over? Can I leave the study before it ends?
The study is expected to end after the semester ends, all participants have completed their surveys and all the information has been collected. The study may be stopped without your consent for the following reasons:

- The PI, the sponsor or the Office of Regulatory Affairs at the University of ****** can stop the study anytime

You have the right to drop out of the research study at any time during your participation. There is no penalty or loss of benefits to which you are otherwise entitled if you decide to do so. Withdrawal will not interfere with participation in the class.

If you no longer wish to be in the research study, please contact Elizabeth Scheyder at ***-***-**** or *****@*****.edu and tell her that you want to withdraw from the study.

How will confidentiality be maintained and my privacy be protected?
The research team will make every effort to keep all the information you tell us during the study strictly confidential, as required by law. The Institutional Review Board (IRB)

at the University of ****** is responsible for protecting the rights and welfare of research volunteers like you. The IRB has access to study information. Any paper documents you sign, where you can be identified by name will be kept in a locked drawer in Elizabeth Scheyder's office. These documents will be kept confidential. All the documents will be destroyed when the study is over. Any data or surveys completed online will remain online and will never be printed in any way that would identify you by name. Any documents that are printed will also be kept in a locked drawer in Elizabeth Scheyder's office, and will be destroyed when the study is over.

Will I have to pay for anything?
There are no costs associated with participating in the study.

Will I be paid for being in this study?
There will be no monetary compensation for participating in this study. Please note that if you receive more than $600.00 compensation in one year for participation in research studies at the University of ******, you must provide an Individual Tax Identification Number or Social Security Number for tax purposes.

Who can I call with questions, complaints or if Im concerned about my rights as a research subject?
If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research subject, you should speak with the Principal Investigator listed on page one of this form. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the Office of Regulatory Affairs with any questions, concerns or complaints at the University of ****** by calling (***) ***-****.

Appendix E: Survey for the Treatment Group

1. How many of the class recordings did you use?
☐ None
☐ One
☐ Two or Three
☐ Four or Five
☐ More than Five, but not all of them
☐ All of them

2. If you didn't use the recordings, why not? Check all that apply.
☐ I did not know the recordings were available
☐ It was too difficult to access the recordings
☐ I did not have time to use recordings because of other commitments
☐ I did not spend time using recordings because they were not required for class
☐ I did not have any particular problem with the course, which would be the only reason I would ever use the recordings
☐ Other (please specify): ──────────────────

If you didn't use any of the recordings, please skip to Question 7. Otherwise, please continue with Question 3 on the next page.

3. Why did you use the recordings? Check all that apply.

I used them . . .

☐ to listen to a class that I missed

☐ to study or review during the semester in general

☐ to study or review for tests and quizzes

☐ to study or review for the final exam

☐ to recall what was said during class that I didn't quite catch

☐ to listen for chalkboard or PowerPoint examples that I didn't copy down fast enough in class

☐ to mimic the teacher's correct pronunciation of words

☐ to mimic the teacher's correct grammar

☐ to determine where I learned more or where I need to improve

☐ to gauge my learning compared to classmates

☐ to improve my articulation of certain sounds and words

☐ to improve the rhythm, stress and intonation of my speech

☐ to listen to see if I could improve my word choice, grammar, etc.

☐ to listen for words and idioms that I don't know, so I can look them up and try to use them later in class

☐ to identify the questions asked by the teacher, so I know what to expect in the future

☐ to review instructions given by the teacher for an assignment

☐ to review the oral exercises and do them again on my own

☐ to listen to the sentences the teacher says to memorize them and speak more naturally

☐ Other reasons for using the recordings (please specify):

———————————————————————

4. How do you think the recordings helped you? Check all that apply.

The recordings helped me ...

☐ learn about the culture

☐ distinguish between tones

☐ recognize grammatical forms

☐ understand the majority of what is said to me in conversations

☐ understand what I hear in television, movies and music

☐ understand humor in conversations and other things I hear

☐ put together novel sentences, not just formulaic ones

☐ express and understand opinions

☐ read Chinese characters and parts of characters

☐ read and understand common texts, such as newspapers and basic books

☐ read and understand more complicated texts and literature well enough to
enjoy them

☐ understand humor in texts

☐ translate a Chinese text into a similar quality text in English

☐ conjugate verbs

☐ make myself understood to others, with only minimal mistakes

☐ introduce myself in Chinese

☐ pronounce different tones understandably

☐ learn enough basic vocabulary to help me if I were lost on the streets of China

☐ understand and use idioms in Chinese

☐ speak at a relatively fluent pace

☐ have conversations about academic and other topics that are more
complicated than daily conversation

☐ completely switch over to speaking Chinese without having to think about
it much, so I could be 'me' in that language

☐ make my pronunciation close to native speakers'

☐ make jokes in conversation in Chinese

☐ learn to write Chinese characters legibly

☐ increase my vocabulary in Chinese

☐ write grammatically correct sentences

☐ write full paragraphs and essays

☐ write real letters for personal and business purposes (for example, to a landlord)

☐ write creatively (such as poems)

☐ Other ways they helped (please specify):

_____

5. In what circumstances did you play the recordings?
(rate each on a scale from 1 = 'not at all' to 5 = 'very often')

1   2   3   4   5

☐   ☐   ☐   ☐   ☐   Using a computer for playback, while studying for the course

☐   ☐   ☐   ☐   ☐   On a separate playback device, but while studying
             for the course

☐   ☐   ☐   ☐   ☐ On a portable playback device while doing some other
             activity (walking, exercising, doing laundry, etc.)

6. Were you easily able to access and play the recordings?

☐ Yes, it was very easy

☐ It took a little effort, but I was able to play the recordings

☐ It took a lot of effort, but in the end I was able to play the recordings

7. Do you think classroom dynamics (e.g., level of discussion, pace of presentation) were affected by the fact that it was being recorded?

☐ Very negative effect

☐ Somewhat negative effect

☐ No effect

☐ Somewhat positive effect

☐ Very positive effect

8. I was reluctant to speak up in class because I knew it was being recorded.

☐ Agree strongly

☐ Agree somewhat

☐ Neither agree nor disagree

☐ Disagree somewhat

☐ Disagree strongly

9. In the household where you grew up ...

☐ No one spoke any Chinese

☐ People occasionally used a word or two of Chinese

☐ Others used Chinese, but I never learned any of it

☐ Others used Chinese, and I learned a few words and phrases, but not
  enough to converse with others

☐ I learned enough Chinese to understand it and converse in it with others

**10. What other comments do you have about your experience
using the recordings? Any suggestions for how they could
be more useful?**

——————————————————————————

Appendix F: Survey for the Control Group

1. **What do you think you achieved in your Chinese course? Check all that apply.**

    I learned to ...
    ☐ learn about the culture
    ☐ distinguish between tones
    ☐ recognize grammatical forms
    ☐ understand the majority of what is said to me in conversations
    ☐ understand what I hear in television, movies and music
    ☐ understand humor in conversations and other things I hear
    ☐ put together novel sentences, not just formulaic ones
    ☐ express and understand opinions
    ☐ read Chinese characters and parts of characters
    ☐ read and understand common texts, such as newspapers and basic books
    ☐ read and understand more complicated texts and literature well enough to
        enjoy them
    ☐ understand humor in texts
    ☐ translate a Chinese text into a similar quality text in English
    ☐ conjugate verbs
    ☐ make myself understood to others, with only minimal mistakes
    ☐ introduce myself in Chinese
    ☐ pronounce different tones understandably
    ☐ learn enough basic vocabulary to help me if I were lost on the streets of China
    ☐ understand and use idioms in Chinese
    ☐ speak at a relatively fluent pace
    ☐ have conversations about academic and other topics that are more
        complicated than daily conversation
    ☐ completely switch over to speaking Chinese without having to think about
        it much, so I could be 'me' in that language
    ☐ make my pronunciation close to native speakers'
    ☐ make jokes in conversation in Chinese
    ☐ learn to write Chinese characters legibly
    ☐ increase my vocabulary in Chinese
    ☐ write grammatically correct sentences
    ☐ write full paragraphs and essays
    ☐ write real letters for personal and business purposes (for example, to a landlord)
    ☐ write creatively (such as poems)
    ☐ Other ways they helped (please specify):

        _____

2. Do you think classroom dynamics (e.g., level of discussion, pace of presentation) were affected by the fact that it was being recorded?
- ☐ Very negative effect
- ☐ Somewhat negative effect
- ☐ No effect
- ☐ Somewhat positive effect
- ☐ Very positive effect

3. I was reluctant to speak up in class because I knew it was being recorded.
- ☐ Agree strongly
- ☐ Agree somewhat
- ☐ Neither agree nor disagree
- ☐ Disagree somewhat
- ☐ Disagree strongly

4. In the household where you grew up . . .
- ☐ No one spoke any Chinese
- ☐ People occasionally used a word or two of Chinese
- ☐ Others used Chinese, but I never learned any of it
- ☐ Others used Chinese, and I learned a few words and phrases, but not enough to converse with others
- ☐ I learned enough Chinese to understand it and converse in it with others

5. What other comments do you have about your experience in the class that was being recorded? Any suggestions?

_____

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