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The effects of learner control versus program control of corrective feedback on listening comprehension and vocabulary assimilation of low versus high performers in beginning college Spanish

Powell, Leslie Amy, Ph.D.
The Ohio State University, 1987

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THE EFFECTS OF LEARNER CONTROL VERSUS
PROGRAM CONTROL OF CORRECTIVE FEEDBACK ON
LISTENING COMPREHENSION AND
VOCABULARY ASSIMILATION OF
LOW VERSUS HIGH PERFORMERS IN BEGINNING COLLEGE SPANISH

Dissertation

Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Leslie Amy Powell, B.A., M.A.

* * * * *

The Ohio State University

1987

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Affix
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To My Father and to My Mother,
Charles P. Powell, M.D. & Margaret Dunn Powell

AND

To the Giver of understanding beyond knowledge
and of happiness beyond success.
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Chapter I
INTRODUCTION AND STATEMENT OF THE PROBLEM

The topic of external versus learner control—or an optimum balance between the two—as it affects learning outcomes has received much attention since the early 1950's. Learner control, as the term implies, refers to the degree to which a learner is permitted to make decisions in his/her learning process within a given instructional event; while external control refers to the degree to which the learner is subject to the decisions of others regarding how (s)he is to approach the learning task.

As briefly indicated above, the question of the appropriateness of external versus learner control is often referred to as LOCUS OF CONTROL (LOC), a term that must not be confused with the personality characteristic that refers to the degree to which an individual appeals to self or others in making decisions—also known as locus of control (loc) in educational contexts. Because both definitions of the same term deal with parallel concepts and therefore are both relatable to the issue of learner versus external control of instruction, the term will be abbreviated in upper case (LOC) when referring to the control of instruction per se, and in lower case (loc) when referring...
to the personality characteristic.

The LOC issue is a complex and controversial one that has yet to contribute solidly to a theory of instructional design in lieu of conflicting evidence about the benefits or hazards of learner-controlled instruction. Much of the controversy can be attributed to a premature attempt on the part of researchers to make sweeping generalizations about the superiority of learner control or external control without taking into account numerous other variables that might contribute to the appropriateness of one condition versus the other. There are, for example, multiple components of instruction (i.e., sequence, pace, amount of practice, etc.), many of which could be made subject to either learner or external control. In addition, there are multiple kinds of learning tasks across disciplines, many kinds of media for learning, multiple kinds of learner characteristics that make up different kinds of learners. To complicate the issue further, there is a lack of consistency across studies as to what is considered relevant criteria by which to measure effect and/or utility of learner versus external control. As Steinberg (1977) indicated:

Evaluation measures have included cognitive variables such as achievement test scores, error rates and completion rates as well as affective variables such as anxiety states and attitudes. (p. 84)
In short, more research needs to be done to consolidate present knowledge as to the effect of learner versus external control across different educational contexts and different educational objectives. Only then can common denominators contributing to a theory or theories of instructional design with respect to LOC begin to be established. As Seidel (1971) stated:

The key to optimal allocation of learner controls in the instructional decision process would be for basic research in human learning to a) identify those components of strategy selection and use of which students are capable, b) relate these components to individual characteristics and c) determine where program [or external] control can or cannot handle the same components. (p. 34)

He later added that "the premise is intended to imply that an all-or-none conclusion for locus of control (LOC) is highly unlikely" (p. 37).

**LOC and Programmed Instruction**

In light of the rapidly accelerating age of technology, the issue of learner versus external control has been examined of late in a particularized area of educational research—namely, programmed instruction as in computer aided instruction (CAI) or interactive video (IAV). Within this context, the question of learner versus external control is usually referred to as the question of learner versus program control—that is to say, the question of whether a program should be designed to allow its learners
to control X instructional variable(s), or whether the program itself should control those variables. Depending on the view assumed by program authors, the instructional design of CAI or IAV can be made to adhere either to a program control or learner control paradigm. To illustrate the existing split in instructional design principles for programmed instruction, Steinberg (1977) pointed out that:

Two major CAI systems, TICCIT and PLATO, implemented large scale curriculum projects with different philosophies about learner control. Whereas a basic premise of the TICCIT system was that the student should control course flow, the PLATO system gave lesson authors complete autonomy on educational decisions. (p. 85)

It might be said that of the two instructional design philosophies just indicated, the one in favor of exploiting CAI and IAV technological capacities to allow learner control over certain instructional variables has more intuitive appeal for many educational idealists. At the root of this appeal are two common assumptions about learners. Those assumptions are as follows: (a) that individuals vary in learning characteristics/styles and therefore ideally should be accommodated instructionally in different ways, and (b) that given the great range in individual needs, learners should be allowed to determine how they will approach a given learning task. A corollary to the second assumption is that honoring learners' preferences (via learner control of instruction) is an
acceptable means of accommodating individual learning needs and will therefore result in optimal learning outcomes.

Although the first assumption affirming individual differences among learners is an established principle in educational research, the second has been subject to serious questioning in light of recent empirical studies suggesting that honoring learners' preferences can in fact hinder positive learning outcomes in some cases. Snow (1977) comments on the second assumption and likewise questions its validity:

The idea that learner control can accommodate individual differences rests [on the assumption that] . . . all learners know what is best for themselves at any given moment in an instructional sequence [and that] . . . all are capable of acting on this knowledge. These assumptions are false! One can perhaps give control to all of the learners some of the time, and to some of the learner all of the time. But one cannot give control to all of the learners all of the time. The problem is to determine which learners to give control to when. (p. 11)

**Principle Areas of LOC Research: A Theoretical Framework**

Given the admitted complexity of the question of learner versus external control, Carrier (1984) delineated three main branches of research identified with the issue. While the branches are interrelated and evidence some obvious overlap, each emphasizes a different aspect of the LOC issue. Those three branches are:
1. The relationship of learners' instructional preferences to learning outcomes.

2. The relationship of learner versus external control to learning outcomes of different kinds of learners (i.e., individuals of different learning characteristics/variables).

3. The relationship of learner versus external control of various instructional variables (e.g., sequences, mode, pace, feedback, etc.) to learning outcomes.

With respect to the first branch of research, Carrier mentioned that there is some indication that while an individual's learning style can predict his/her instructional preferences, such preferences are at best an unreliable predictor of learning outcomes (Carrier, Newell, and Lange, 1982), and at worse a negative influence on learning when preferences are honored (Peterson and Janicki, 1979).

The second branch of research Carrier mentioned (i.e., the question of how learner versus external control interacts with different learner types) has involved the investigation of many different learner characteristics in terms of their potential relevance to the LOC issue. Tobias (1976) and Rakow and Ross (1981) were cited as suggesting that the degree of success a learner has in controlling
his/her own course of instruction may be a function of the degree of prior knowledge said learner has of the subject matter in question. Holloway (1978) has indicated that the degree of success a learner has in controlling his/her instruction may be a function of how much (s)he appeals to self rather than others in the decision-making process (i.e., degree of high versus low loc—the personality characteristic). Other characteristics identified by Carrier and others as potentially relevant to the question of how much learner control is appropriate for a given instructional event include field independence/field dependence (Carrier et al., 1984), inquisitiveness (Fry, 1972), achievement motivation (Seidel, 1975), general and situation-specific anxiety states (Hansen, 1974), and age (Fisher et al., 1976; Peterson and Janicki, 1979; Judd et al., 1970; Lahey and Crawford, 1970). In addition, Cronbach and Snow (1977) contributed much to a research tradition known as Aptitude Treatment Interaction (ATI), which investigates the effect of learner versus external control on learners of high versus low aptitudes.

The third category Carrier mentioned focussed on the effects of learner versus external control across different instructional variables. The importance of understanding this line of research has been pointed out by Steinberg (1977), who has observed that "the definition of learner control has varied from that of allowing the student to
make decisions of just one aspect to that of almost complete control of instruction" (p. 84). It therefore becomes evident that the character and effect of learner control can vary greatly depending on which variables are involved or excluded. Some of the instructional variables Carrier mentioned as having been examined in the LOC issue include mode (or means of presentation, as in "lecture" versus "discussion", or "CAI" versus "textbook"—Carrier, 1984); pace, sequence of instruction, and feedback.

In sum, Carrier's discussion of all three branches of research serves to clarify and interrelate existing knowledge on the LOC issue as well as to provide a theoretical base upon which to formulate further hypotheses. The first branch of research indicated that honoring learners' preferences on the course of their own instruction does not necessarily contribute positively to their learning outcomes. On a slightly more involved plane of information, the second branch of research pointed out a distinction between what learners of a given characteristic may choose and what they may need for optimal learning outcomes. The third branch of research served to corroborate Seidel's aforementioned argument that "an 'all or nothing' conclusion for Locus of Control is highly unlikely" (see page 3 of this document), that it is necessary to examine each instructional variable in isolation in order to come to understand the implications
of its being subject to learner or external control for certain learners.

LOC of Corrective Feedback: A Model Study

In 1985, Belland et al. conducted an LOC related study that examined in particular the instructional variables of pace and corrective feedback (i.e., remedial instruction or review in the case of learner error). With respect to the latter variable, the researchers investigated the relationship of student behavior under learner control of feedback to performance. The researchers' findings, in keeping with the literature's indication that learners do not always make sound instructional choices, suggested that "students who may need elaborate feedback the most are those least likely to opt for it" (p. 19).

A more complete description of the study will be provided in the following chapter; the finding most relevant to the present discussion was that students who scored highest on test items following a CAI lesson on the cardiovascular system were those who had opted for significantly more corrective feedback after erring on activity questions than those who had scored lowest. This observation led Belland et al. to consider the following: whether it is necessary to make remedial instruction/feedback obligatory rather than optional to some learners, and if so, to which learners.
Statement of the Problem

The objective of this study was to pursue the issue that Belland et al. raised by again examining the variable of corrective feedback under both learner and program controlled conditions, this time within the context of an IAV lesson in Spanish. Specifically, the following research questions will be investigated:

1. What is the relationship between the number of times corrective feedback for errors is refused (henceforth called the Quitting Index) by beginning college learners of Spanish during a learner controlled IAV Spanish lesson and scores in listening comprehension?

2. What is the relationship between the Quitting Index (see Question 1) of beginning college learners of Spanish during a learner-controlled IAV Spanish lesson and scores in vocabulary assimilation?

3. Is there a difference in the number of times corrective feedback is refused on an IAV learner-controlled Spanish lesson between high versus low performers in beginning college Spanish (where adjustments have been made for differences in the number of initial misses committed)?
4. What is the effect of learner-controlled (optional) corrective feedback versus program-controlled (obligatory) feedback for every error committed during an IAV Spanish lesson on **listening comprehension** of low performers in beginning college Spanish?

5. What is the effect of learner-controlled (optional) corrective feedback versus program-controlled (obligatory) correct feedback for every error committed during an IAV Spanish lesson on **vocabulary assimilation** of low performers in beginning college Spanish?

6. What is the effect of learner-controlled corrective feedback for every error committed during an IAV Spanish lesson on attitude toward instruction in **low** versus **high** performers of beginning college Spanish?

7. What is the effect of **program-controlled** versus **learner-controlled** corrective feedback for every error committed during an IAV Spanish lesson on attitude toward instruction in low performers of beginning college Spanish?
Definitions of Terms

1. **Interactive Video (IAV)** refers to that medium consisting of a microcomputer interface system programmed to (a) instruct, train, and/or test with the audiovisual assistance of videotapes or videodiscs, and (b) employ an exchange of input between learner and computer program in a way that promotes learning. The particular IAV program that was used in this study utilized a videotaped version of "Hablamos Español," a television series designed to teach Spanish in a progressive, linear fashion through the presentation of humorous skits. The skits were one to four minutes in duration and incorporated Spanish vocabulary, grammatical constructions, and levels of repetition considered to be commensurate with the experience/level of the intended audience. The particular segment that was utilized for the study was a segment from Lesson Five and therefore definitely is considered a lesson at the beginning level.

2. **Practice Comprehension Question (or Item)** refers to any adjunct question posed to the subject that was related to the content of the videotrama presented and that required the subject to indicate his/her interpretation of conversational exchanges within that drama. Twenty-one practice items were posed in
English, appeared on the computer screen after the second and final showing of the videodrama, and required a type-in response by the subject. The computer was programmed to respond affirmatively to certain key words anticipated by the researcher as likely to be contained in an acceptable response.

3. **Error** (synonymous to "item missed") refers to an unacceptable response made by a learner to any of the practice comprehension questions as defined above.

4. **Corrective Feedback** refers to what was intended to be the instructive portion of the computer's programmed response to errors. Corrective feedback followed a computer announcement to the subject that his/her answer to a given item was unacceptable, and consisted of an instant replay of the scenario containing information relevant to the question asked. Subsequent to the provision of corrective feedback, the subject was given another opportunity to respond to the question.

The feedback variable was selected for the study in light of the major dependent variable of interest—listening comprehension—and the orientation of the instructional instrument used to develop it. That is to say, the IAV instrument was designed primarily to give
learners the opportunity to listen to conversational Spanish and to interpret the meaning of what they heard. Because the objective of the proposed IAV lesson was to provide practice for beginning learners of Spanish in listening comprehension, the procedure involved little formal instruction other than to encourage learners to hypothesis-test language input by relying on both aural and visual cues provided in the videotaped minidrama to be observed. Consequently, emphasis on the IAV lesson was in fact on the feedback provided to learners as they responded to comprehension questions generated by the program.

5. **Learner Control** refers to the experimental condition in which the subjects had the option to accept or refuse corrective feedback subsequent to committing an error on a practice comprehension item—up to three times per item.

6. **Program Control** refers in this case to IAV automatic—and therefore obligatory—looping to corrective feedback for every error a subject committed on a practice comprehension item, up to three times per item.

7. **Quitting Index** (Q.I.) refers to that measure that indicates the total number of times a given subject "quit" an item early, in the sense of not having
gotten or made maximal use of available corrective feedback in the case of errors. "Maximal use" would imply a subject's (a) using sufficient enough feedback to make a right response, or (b) using the maximum three replays permitted per items, at which point the subject might or might not make an acceptable response.

Because subjects under program control were obliged to receive corrective feedback for every error they committed (up to three times per item), they had by definition a quitting index of zero. That is to say, for every error they committed they never (were allowed to) quit the available corrective feedback; their total number of "quits" necessarily was zero.

Subjects under learner control, however, had a say in their own Q.I., they controlled the amount of corrective feedback made available to them (up to three times per item). A subject under learner control, therefore, had the option to "quit" the practice portion of the IAV lesson (containing 21 lessons) item anywhere from zero to 21 times.

Operationally, Q.I. is defined as the number of practice questions for which maximal use of feedback was not accessed in the case of errors. It therefore can be stated that for every question on which a subject "quit" early, his/her Q.I. increased by 1.
The quitting index was designed in response to a decision that feedback measure should not be a question of how many times feedback was received for total errors committed. (Such a ratio would amount to disproportionate, misrepresentative comparisons). In contrast, Q. I. was designed to measure how many times a learner "quit" an item on which (s)he had erred before receiving the maximal amount of feedback on that item. Hence, it should be noted that the Q.I. is not in itself a measure of how much feedback is received by a subject; rather, it measures how much accessible feedback for error is not received by a subject.

8. **Initial Misses** refers to the total number of first-time "misses" (incorrect responses) made by a subject within each of the 21 practice questions presented during the IAV lesson. The initial miss index is relevant in that it indicates the number of times a given subject had the **opportunity to quit**—an important variable for which to adjust when comparing quitting indices across performance groups.

9. **Listening Comprehension** will be defined as the number of correct responses achieved on a sentence completion test consisting of 21 items based on the same content
tested by the practice questions during treatment. A copy of the listening comprehension measure is included in Appendix D.

10. **Vocabulary Assimilation** refers to the percentage of first-time vocabulary (i.e., vocabulary unknown to the subject prior to his/her viewing the videotrama) that is correctly identified in English on a written test taken by the subject following treatment. The posttest itself will be taken on a duplicate copy of the vocabulary handout used during treatment (See Appendix IV).

11. **High performers** refer to those subjects apparently predisposed to high performance in Spanish in that their averaged midterm scores (prior to treatment) roughly represented the top third (i.e., 31 percent) of scores in the class. Subjects who achieved a score of 94 or above, therefore, qualified as high performers. **Low performers** refer to those subjects apparently predisposed to low performance in Spanish, in that their midterm scores prior to treatment roughly represented the bottom third (i.e., 30 percent) of scores in the class. Subjects who achieved a score of 74 or below qualified as low performers.
It should be noted that the categorization of subjects into high and low performers is one of preclassification, based on a pretest measure (i.e., the midterm). Its purpose was to identify students as demonstrating high or low ability in Spanish prior to treatment, and is not to be confused with categorization on the basis of posttest scores on the dependent variables.

Assumptions and Limitations

Despite predicted differences in previous Spanish students of the The Ohio State University to be used as subjects, it was assumed that the particular videodrama contained in the IAC lesson contained language input beyond that to which all subjects had been exposed. Consequently, it was assumed also that subjects would need to hypothesize meaning of unfamiliar language input by depending on both verbal and visual cues provided in the videodrama.

With respect to limitations, it has been acknowledged already that prior to the present study, the theoretical base upon which this study is built—namely, that learners might at times learn optimally under instructional conditions that they would not ordinarily choose for themselves—had not yet been tested empirically either within the context of the foreign language listening comprehension and vocabulary assimilation constructs or
under conditions of "corrective feedback" as defined as replay of target language input. At the same time, said limitation provided a rationale for which to conduct the proposed study. A second potential limitation was that the production from which the videotape for the study was made is in black and white—thereby potentially limiting the number of physical/contextual cues a learner might be able to extract from the videotape were the production in color.

It should be acknowledged at this point that given the application of the term "feedback" in this particular study, it is possible to conceptualize the variable as one of practice as opposed to feedback. From the researcher's perspective, whether or not the variable should be considered feedback, practice, or a combination of both is not of primary concern; the use of a label in this case is merely a question of convenience. What is essential is to understand whether forced review of target language input over optional review make a difference in learning outcomes in low performers in Spanish.

Summary

The present discussion has indicated that the popular and intuitively appealing assumptions about the benefits of learner-directed instruction as a way to attend to individual learning needs have influenced heavily models of
instructional design across disciplines, yet without a strong empirical base on which to stand. Furthermore, it was established that there is empirical evidence that in certain contexts external control of instruction sometimes has resulted in better learning outcomes than has learner control. As will be demonstrated more fully in the chapter to follow, variables shown to contribute to said contexts have included learner characteristics, the particular instructional variable(s) subject to external control, and the nature of the subject matter and task themselves. This understanding provides a rationale for investigating the effects of learner versus program control of feedback within the selected discipline of Spanish (listening comprehension and vocabulary assimilation) on beginning college learners of high versus low performance tendencies.

In the chapter to follow, literature on research/issues relevant to LOC will be outlined and discussed. In Chapter III, the implementation and statistical design of the present study will be described. Chapter IV will present the results of the statistical analyses as well as attempt to interpret and/or account for these results. Finally, Chapter V will summarize the problem, procedures, and results of the research, explore the pedagogical implications, and make recommendations with respect to both application and further research.
Chapter II

REVIEW OF THE LITERATURE

Introduction

As indicated in the previous chapter, a major argument in favor of learner control of instruction is based on the assumption that learners are in fact their own best judges with respect to managing their own learning events. Such an assumption would presume not only adequate learner judgement but a comparable amount of learner integrity by which to follow through on that judgement. By the same argument, proponents of learner-controlled instruction have suggested that external control might hamper or restrict motivation, the learning process, or both. As Steinberg (1977) stated:

The major premise of other research in learner control was that if the student were in charge of his own learning, or at least would participate in some way, he would be more motivated, would have a positive attitude, and be more attentive to the task at hand. (p. 87)

This literature review will address in more detail than previously discussed the central issue of learner judgement as it relates to the question of learner control. Because some assumptions related to LOC have been so firmly linked to motivation, a summary of studies attempting to ascertain
the connection between LOC, motivation, and their joint impact on learning will be provided. Additional learner and instructional variables potentially relevant to the control issue—as well as alternative experimental approaches (paradigms by which to examine them)—will be discussed also.

Learner Preferences and Learning Outcomes: Examining Instructional Variables

Peterson and Janicki (1979) conducted a study that investigated the effects of honoring learner preferences for instructional method (as related to group size). The study involved two small groups and two large groups of elementary level learners of math. Two instructors were assigned to teach a two-week unit on fractions; each was assigned to teach one small group and one large group and each was to follow a prescribed "big group" or "small group" instructional approach—whichever was appropriate. Some subjects were assigned to the group size of their preference; others were randomly assigned to the group size regardless of preference. Ironically, posttest scores indicated that those subjects whose preferences had been honored tended not to perform as well as those whose preferences had been disregarded—i.e., learners who had expressed a preference for one group size but had been
placed in the other outperformed members of the same who had been placed in the group size of their choice.

On the college level, Carrier, Newell, and Lange (1982) pretested college learners of dental hygiene for learning styles, and discovered a pattern between learning style and expressed preference for instructional method. Nevertheless, no relationship could be found between honored preference for instruction and end-of-course achievement. Likewise, Tobias (1972) found that college students given the choice between "overt" or "covert" response style in a CAI lesson did not outperform those who were not given their choice.

Fisher (1976) gave one of two groups of elementary learners of arithmetic the opportunity to choose the level of difficulty at which they wished to engage in the learning task. Each member of the second group was yoked randomly to a level of difficulty decided by a member of the first group. Fisher's initial hypothesis was that by honoring learner preferences of the first group, this group would complete a greater number of problems at a greater percentage of accuracy. What in fact resulted was that while members of the preference-honored group did in fact complete more problems, their percentage of accuracy was significantly lower than that of their yoked counterparts—despite the fact that the researchers
observed learners of the first group to select "difficult" and "easy" items alike.

On the college level, Whitlock (1976) permitted learners of computer science to take an exam at the difficulty level of their choice. Interpretation of test results led to the conclusion that subjects tended to choose levels that were too difficult for them—perhaps because, as Steinberg suggested (1977), learners were promised more points for items marked "difficult." If such was in fact the case, external motivation proved in this situation to distort rather than aid learner judgement of how to control his/her learning.

Lahey et al. (1976) sought to determine whether naval students of electronics who were learning the use of the multimeter via CAI would learn more effectively when allowed to control both level of difficulty and sequence of instructional strategy. Three groups were compared: one in which learners had complete say over both instructional variables with no overt external influence; one in which learners had ultimate say over both instructional variables, yet with program "advisement" provided; and one in which both difficulty level and sequence of presentation (i.e., rule-example-practice) was predetermined. The initial hypothesis was that honoring learner preferences via learner control over said variables would make a favorable difference in learning outcomes and/or attitude
toward instruction. No significant difference, however, was found in favor of either learner control or learner control with advisement group. Under these two learner control conditions, Lahey et al. noted that level of difficulty was the variable less manipulated—i.e., in most cases, learners refused to make a change in difficulty level once they had made an initial decision.

Oliver (1971) investigated LOC with respect to the instructional variable of sequence. He invented an imaginary science system and used CAI to instruct learners according to a sequence determined either by the learners themselves or by a predetermined (program) sequence. Learners under their own control of sequence performed at a significantly lower level than those under program control.

Studies investigating the instructional variable of amount of practice have been conducted as well. The studies, however, collected in this area present conflicting and inconclusive results. Some subjects who were allowed to decide how much practice they needed were judged to have practiced at the "optimal level" (Judd et al., 1970); other subjects were judged to have opted for unnecessarily excessive practice (i.e., time inefficient or counterproductive: Lahey et al., 1975); still others seemed to gravitate only toward those practice problems perceived to be commensurate with their ability and to avoid those problems perceived as beyond their capacities (Montanelli
and Steinberg, 1976). In contrast, Wilcox (1978) argued that learner choice over the practice variable was of little consequence. Working with college learners of mathematics, he yoked pairs of subjects in such a way that for every subject who was allowed to determine his/her own number of practice items (which included corrective feedback), another subject was later obligated to follow that same amount of practice under conditions that appeared to have been determined by a standardized CAI program. The central question was whether the learner of each pair who had in fact determined the number of practice items would outperform his/her yoked counterpart; no significant difference within pairs was discovered, however.

Up to this point, the discussion on the relationship between learner preference and learning outcome has centered primarily on studies in CAI—given that more research has been conducted on the LOC issue via CAI than via the interactive video (IAV) medium per se. With respect to IAV itself, Laurillard (1984) made a strong claim to the need for instructional media to honor learner preferences and argued that learning via program control imposes too many constraints on learners. She attempted to build this argument, however, on the assumption already rendered invalid in this discussion: that honoring individual learning preferences leads to improved learning outcomes. Laurillard's adoption of this assumption was evidenced by
the character of the study itself. She examined 22 college learners in technology and compared learning experiences of students on an IAV technology lesson. Subjects were randomly assigned to one of two conditions: those allowed maximum control over mode (i.e., "active" versus "passive" learning is encouraged), strategy, and sequence of instruction, and those who were made subject to program control over the same three variables of instruction. Laurillard's criterion for measurement, however, was not learning outcomes, but rather learning behavior with respect to (a) the amount of initiative learners took in making choices and (b) affective responses toward having to make choices. Laurillard's data led her to three conclusions: (a) that the majority of students preferred to make their own choices over not being allowed choices, (b) that when offered a choice, students appreciated suggestions as to which choices to make (via computer-provided advisement), and (c) that with or without advisement, learner choices ultimately should be honored.

While the data collected in Laurillard's study may have been accurate, her third conclusion loses credibility in light of the previously discussed literature showing that honoring learner preferences is no guarantee of positive learning outcomes. Furthermore, the fact that Laurillard included no measurement of learning outcome in her study
left her with no evidence to challenge what other literature has reported to the contrary.

Gay (1986) likewise used a computer-assisted video lesson in science to compare the effects of learner control versus program control of several components of instruction. Because a major contribution of her study is relevant to a body of literature concerned with the relationship of LOC to differences in learner ability (high versus low), this study will be treated in a future section.

The Interactive Effects of Attitude/ Motivation and LOC

The majority of studies discussed above demonstrate learner preference, as manifested via learner control, to be a poor predictor of learning outcomes. Fisher's idealistic assumption (1976) was that honoring learner preferences necessarily evokes a chain reaction leading to a better attitude toward instruction, a higher degree of attention, and better learning outcomes. This assumption, however, appears untenable, as indicated by the literature already discussed in this section. Lahey et al. (1975) indicated, and both Tobias (1972) and Carrier et al. (1982) implied that although subjects under learner control had a more positive attitude toward instruction, they achieved no more than those under program control. In Fisher's study
(1976), subjects under learner control actually did worse—albeit with a greater degree of enthusiasm and task engagement. Studies under Denton and Woods (1975), Lahey et al. (1976), and Montanelli and Steinberg (1976) showed subjects under learner control to have neither a better attitude toward instruction nor higher achievement than those under program control.

Attempts to account for such results have been made by various researchers. It will be helpful to review the suggestions of some and to introduce the ideas of others. Snow and Peterson (1980) have implied that a better attitude toward instruction is not necessarily synonymous with a stronger degree of motivation to learn. Rather, they suggested that some learners may favor instruction according to what they perceive would require less concentration, work, or time. Some learners may prefer to control their own instruction in order to avoid certain learning tasks/ experiences that they perceive will lead to failure, and in so doing deny themselves the opportunity to advance in learning. As will be further discussed in the following section, Fry's study (1972) demonstrated subjects with high ability who enjoyed controlling their own learning and yet performed poorly, apparently because of a low level of inquisitiveness toward the subject matter itself. Some learners, when not forced to attend to instruction at a moderately rapid pace, cannot otherwise be
motivated to concentrate and/or process information as efficiently (Belland et al., 1985). Others, motivated by a strong drive to achieve or compete, may subject themselves to such a degree of stringency (Lahey et al., 1975; Whitlock, 1976), or to such a degree of anxiety (Hansen, 1974), that the learning process becomes counterproductive. In short, the reason for which learners may wish to make choices in instruction may have little or nothing to do with either their knowledge of or desire for what leads to optimal learning.

Examining Learner Variables: The Aptitude Treatment Interaction (ATI) Approach

Given that the variable of learner preference alone has shown itself to be an unreliable predictor of possible learning outcomes, additional variables related to learners themselves and their individual differences have been investigated for their potential relevance in the LOC issue. As mentioned in Chapter I, the question of whether learner aptitude (high versus low) plays a role in the efficacy of learner versus program control has received much attention via the Aptitude Treatment Interaction (ATI) research tradition, commonly associated with a hypothesis promoted by the Cronbach and Snow analyses (1977). Aptitude is the construct that refers to how quickly one is able to master a given skill or subject matter. Fairly extensive
treatment of the ATI studies perhaps can be attributed to the more apparent visibility and applicability the aptitude variable has across educational contexts. Furthermore, advocates of an ATI approach to LOC might argue that other learner variables investigated in LOC literature—age, curiosity, motivation, prior knowledge, locus of control (loc), field independence/dependence, etc.—become relevant largely to the extent that they influence or interact with a learner's aptitude toward mastering a given task under certain learning conditions. In this sense, aptitude might be considered a primary learning characteristic under which subsidiary learner characteristics could be subsumed (as in some kind of hierarchical relationship).

The basic premise of the ATI hypothesis is that learners of low aptitude (be it general or specific to the relevant subject matter) benefit from a greater degree of structured, externally controlled instruction than do high aptitude learners, whose cognitive processes and strategies appear less inhibited when they have a greater degree of control over their own course of learning. Some of the ATI studies have limited empirical value in that differences in instructional methods compared across aptitudes have been too broad for conclusive interpretation of results (i.e., see page 22 [Peterson and Janicki, 1979] and page 23 [Carrier et al., 1982]). Even these studies, however, corroborate the hypothesis' premise that learners of
different aptitudes respond differently to the degree of external structure applied to their instructional experience. Other ATI studies, by nature of their more controlled experimental conditions, better underlined the notion that:

... not all students were capable of making appropriate educational decisions. The poorest decision-makers were the students who knew little about the subject or who were performing poorly in it. (Steinberg, 1977, p.88)

In effect, the ATI studies were able to provide a perspective on the LOC issues that studies focusing on learner preference alone could not: the ATI studies went beyond merely determining which percentage of learners succeeded under learner versus program control— they had potential to identify what kinds of learners were falling under these percentages.

In the Peterson and Janicki study (1979) previously discussed, for example, the researchers discovered that when elementary level arithmetic students were given their choice of either large-group or small-group instruction, they tended to perform more poorly than subjects of the same sample whose preferences for instructional style had not been honored. What was discovered upon ATI analysis, however, was the additional relevant information that in spite of their tendency to prefer small-group instruction, low-ability learners (according to a pretest measure) demonstrated a comparatively higher degree of learning when
under large group instruction. Conversely, in spite of their tendency to prefer large-group instruction, high-ability learners (according to pretest measure) demonstrated a comparatively higher degree of learning when in small-group instruction. Apparently more board work and question asking were emphasized in large-group instruction, while straight lecture and subsequent discussions were emphasized under small-group discussion.

Judd et al. (1970), observing remedial college students of mathematics, tested the hypothesis that learners given varying degrees of control over their own instructional sequence in a CAI math lesson would perform at least as well as members of the same sample under a program controlled instructional sequence. The hypothesis ultimately was rejected: learners controlling their own sequence, whether partly or fully, did worse—particularly those identified as low achievers on a pretest.

Carrier et al. (1985), examined the interactive effects of both general ability (high vs. low) and loc the learning characteristic (high internal control versus low internal control) on the learning outcomes of sixth graders in a computer-based concept lesson on advertising strategies. Once subjects were preclassified with respect to the learner characteristics just mentioned, they were randomly assigned to one of three treatments: (a) an LC condition that contained optional elaborate instruction available in
varying degrees, as determined by the subject, (b) a
("lean") PC condition, where a core lesson was presented
with no elaborative instruction available, and (c) a
("full") PC condition that consisted of both the core
lesson and considerable elaborate instruction to which the
students were subjected without choice.

Students of like ability were compared under the LC
treatment versus the two versions of PC treatment. Results
revealed that the high ability subjects did better when
exposed to the the most elaborate instruction, and best
when that exposure was by choice (as in LC), presumably
because they were willing to use it to full advantage. The
researchers admitted, however, that it was difficult to
determine whether or not at times high ability subjects
reviewed material "beyond a point of productivity"
(p. 209). When low ability students under the three
experimental conditions were observed, it was discovered
that they tended not to make nearly as much use of
available feedback under LC as high ability students. When
low ability subjects were placed under either "lean" or
"full" version of the PC treatment and compared with LC
subjects of like ability under comparable amounts of
material, their performance did not improve significantly.

With respect to locus of control the learner
characteristic, it was discovered that subjects of high
internal control performed worst on the "lean" version
under PC. The outcome was attributed to the acknowledged tendency for high internality learners to be achievement oriented and self-directive in learning tasks. Surprisingly, however, it was also discovered that high internality subjects did significantly better when exposed to the "full" treatment under PC than when exposed to the LC treatment, where accessibility to full elaborate instruction was likewise available. This finding was counter to the researchers' prediction that said subjects would best be accommodated by the learner control ("options") treatment. No attempt was made to account for such unexpected findings, apart from the comment that "full treatment was a rich instructional environment" in which the "students saw the maximum number of expository and practice instances as well as analytical feedback for each response(p. 211)." Finally, the researchers observed that low internality subjects performed better under the PC conditions, as predicted, but only when under the "lean" as opposed to "full" version.

Under simulated computer-aided instruction conditions, Fry (1972) compared three levels of LOC conditions in beginning college learners of computer science: (a) where learners determined sequence and pace of instruction, along with feedback as elicited live from instructors, (b) where learners had apredetermined sequence of instruction, matched with additional information provided through
pre-recorded feedback from the first condition, (c) where both instruction and corresponding pre-recorded feedback from the first condition were randomly sequenced, and (d) where subjects of a control group received no instruction but took the same posttest as the other three groups.

All learners were precategorized according to two learner characteristics: inquisitiveness (high or low) and aptitude (high or low). Subjects were then randomly assigned to the four treatment conditions. Analysis of variance on the criterion variable—learning outcome—revealed significantly superior learning by high-inquiry/high-aptitude learners under the learner-controlled condition, and by low-inquiry, high-aptitude learners under the instructor-controlled condition. Learners of high-inquiry but of low aptitude did better under instructor-controlled conditions than under their own control, and learners low in both aptitude and inquiry achieved so poorly that "results are difficult to interpret" (p. 461). It is noteworthy that in Fry's study the learner variable of inquiry appeared to have a significant bearing on the LOC issue just as aptitude did: that is to say, when either aptitude or inquiry level was low in learners, such learners performed better under externally controlled instruction.

Hansen (1974), like Fry, applied the ATI paradigm to examine the effects of LOC on female college majors in
education pretested for traits other than ability/aptitude. Not only were subjects pretested for general reasoning ability; they were pretested for associative memory and general anxiety states as well. The instructional variable examined under the two LOC conditions was corrective feedback in response to learner errors on test items; the criterion variables included not only performance, but task-specific anxiety states as well.

Subjects were assigned to learn about Xenograde system in one of three CAI lesson conditions: no feedback, obligatory feedback, and learner-controlled feedback—in which learners could opt to receive feedback or not. Feedback consisted of an indication of whether the response to a test item was true or false, plus a periodic review of the relevant rule. In order to induce an initial anxiety state, subjects were told prior to the lesson that their performance would be ranked as an indicator of intelligence. Situation-specific anxiety states were measured at three different intervals throughout the lesson, and performance of all subjects was measured upon completion of the lesson.

Data corroborated Hansen's hypothesis that anxiety states were comparatively lower under learner-controlled conditions than under program-controlled conditions. Subjects of high general anxiety state showed the least amount of anxiety when under the no feedback condition.
With respect to performance, high reasoning learners resulted better under obligatory feedback, and least under no feedback. In contrast, low reasoning learners performed better under learner-controlled feedback than under obligatory feedback, and best under no feedback at all.

Hansen's findings are in direct opposition to what the ATI hypothesis proposes, i.e., that high ability/aptitude learners tend to perform better under learner-controlled instruction and that low ability/aptitude learners tend to perform better under program-controlled instruction. While the reason for this discrepancy is uncertain, it is helpful to bear in mind that the primary question in Hansen's study focussed on the effect of feedback on learner anxiety states; the question of its effects on performance or whether feedback impacts differently under learner versus program control was secondary. Consequently, both the focus of the study and the deliberate instigation of anxiety states on the subjects may have had a direct bearing on such contrasting results.

Another ATI study whose outcome contrasts with what the ATI hypothesis proposes is that of Reinking (1983). He examined subjects precategorized as "good" or "poor" readers in the intermediate grades to see how reading strategies via CAI might differ among subjects when given a selection of up to five available optional reading aids: (a) vocabulary definitions, (b) a simplified rendition of
the text, (c) relevant background information, (d) the main ideas of the text, and (e) an option to reread the passage. Members of a program control group, also consisting of good and poor readers, were given no options as to the selection of reading aids; rather, they were obliged to review all five reading aids for every passage they read. In contrast to findings of other ATI studies discussed, both good and poor readers under learner control tended to access the reading aids in parallel patterns—i.e., the "reread" option was the most often accessed. Nonetheless, the overall performance of subjects under learner control was significantly lower than that of subjects of the program controlled condition, in which elaborate rehearsal of reading information was forced.

Like Reinking, Rakow and Ross (1981) examined the effects of LOC on high and low performers where level of prior achievement in the relevant subject matter (rather than general ability) was the criterion for preclassifying subjects accordingly. Using 124 college students of psychology as subjects for a CAI program is mathematics, the researchers pretested them for level of mathematical ability and subsequently assigned them randomly to one of four conditions. Under LC, optional elaborate instruction of up to 24 mathematical examples was made accessible to the subjects. Under PC, the number of mathematical examples automatically presented to learners was designed to
accommodate each subject in accordance to his/her pretest scores, as recommended via a measure designed by Ross et al. (1980). Under "nonadaptive control," students were subjected to a fixed number of mathematical examples. Finally, a "lecture treatment" was administered in place of the CAI presentation, its content imitating that of the nonadaptive control condition.

Regardless of preclassified achievement level, subjects under the PC treatment did significantly better than those under the other treatments. It must be stressed, however, that in this particular study the "program control" treatment implied an individualized program for each subject as deemed appropriate for his/her level of prior achievement. With reference to this important distinction in the operationalization of PC, Rakow et al. added that "prior achievement has been shown to be a strong determinant of the amount of instructional support that is optimal for learning . . . when all students are prescribed a standard unit of instruction, mismatches between individual needs and learning conditions necessarily occur" (p. 751).

It must be added, however, that when the concept of PC is extended to mean external control of individualized adaptive instruction as exemplified by Rakow and Ross, the criteria for determining what constitutes "optimal
instruction" for a given learner perhaps becomes a far more critical issue than the issue of program control itself.

Gay (1986) used a computer-assisted video lesson to examine the effects of learner versus program control on college students with varying degrees of prior understanding in that subject area. The students were preclassified by a pretest as "high" or "low" in previous conceptual understanding of a particular area in science (HCPU vs LCPU). Members of both ability groups were assigned randomly to a learner controlled and program controlled computer-assisted video lesson. Under LC, subjects controlled pace, sequencing, presented mode (i.e., video, audio, graphics, or text), amount of practice, and depth of study. Under PC, the same instruction was predetermined for all; subjects controlled pace only. Following the video lesson, both ability groups under both LOC conditions were evaluated. They were also compared with respect to time on task. Results revealed that HCPU subjects performed equally well on science posttests under both LC and PC conditions. In addition, LCPU subjects predictably performed significantly better under PC than under LC. Quite unexpectedly, however, no difference was found between scores of LCPU subjects under PC and those of HCPU subjects under either LC or PC condition.

While Gay's study yields dramatic findings, difficulty in interpretation lies with the fact that so many
components of the CAI lesson were made subject to learner control. Consequently, it becomes difficult to determine which components under LC were most influential in the reported learning outcomes.

To recapitulate, the Aptitude Treatment Interaction studies as promoted by Cronbach and Snow endeavor to identify those learner characteristics most amenable to instruction under either learner or program control. Aptitude or ability measures have been the most commonly examined traits across subjects; other learner characteristics, however, such as inquisitiveness and anxiety have been examined with reference to the LOC issue as well.

The Cronbach and Snow ATI analyses have popularized the notion that high ability/aptitude learners tend to be more successful when governing their own instruction and that low ability learners tend to be more successful under externally controlled instruction. Findings from other studies, however, do not support the ATI hypothesis. At the present stage of empirical knowledge, reasons for such discrepancies are unknown. Possible explanations may be related to qualitative differences between the construct of aptitude—where time on task is a factor—and ability, where time on task is not necessarily a factor. It must also be noted that different outcomes may be expected when
general ability as opposed to subject-specific ability is the basis for preclassification. Explanations may also be related to the existence of other learner variables—apparent or hidden—that would override the influence of learner ability. It is also possible that the way LOC interacts with the aptitude/ability variable may vary depending upon both the general subject matter to be learned and the specific task required of the learners. In lieu of so many contrasting and presently hard-to-interpret findings, the need for further research with respect to the role of aptitude and other learner variables in the LOC issue becomes evident.

An Alternative Approach to the Question of Learner Variables, Learner Types, and LOC

The ATI procedures previously discussed attempted to preselect learners on dichotomous levels of a variable or variables (i.e., aptitude, inquisitiveness, anxiety, etc.) presumed to be critical to differential learning outcomes under the two LOC conditions. Learners' relative success or failure under each condition were then attributed to the preselected learner variable.

An alternative approach to identifying learner characteristics relevant to the issue of LOC is one in which researchers make no presumption a priori as to which learner variable(s) should be sensitive to LOC. Rather,
learners of a given population are randomly assigned to one or the other LOC condition, those who achieve the $X$ number of highest and lowest scores on the criterion variable are singled out, and these learners are then studied for their learning behavior in response to the LOC condition under which they were placed. Under such a procedure, the characteristics of the most successful and least successful learners across LOC conditions can be identified in behavioral terms, if not according to intrinsic learner characteristics.

Belland et. al (1985) used such an approach when they investigated the roles both pacing and corrective feedback play in the learning process under learner versus external control conditions in a CAI lesson on the cardiovascular system. With respect to the pacing variable, it will be mentioned briefly that across five levels of tasks, learners were found to score significantly higher under a moderate degree of externally-controlled pacing, as opposed to total external control or total learner control of pacing. For purposes of the present discussion, however, only the researchers’ approach to the question of corrective feedback will be addressed here. Across all five levels of tasks solicited of learners, the program included an option for elaborate feedback in the event that learners would commit an error in response to an item. Subsequently, the six highest performers (defined as the six highest
scorers on a posttest in each of the three pacing conditions) were compared with the six lowest performers (i.e., the six lowest scorers) with respect to the numbers of times said learners had opted for elaborate feedback for errors during practice. It was discovered that across each pacing condition the highest performers were the ones who had opted for elaborate feedback at a significantly greater frequency than had the lowest performers. Because aptitude was not chosen as an independent variable by which to categorize learners in advance, no pretests on aptitude were included for analysis.

The findings of the study led Belland et al. to suggest that

... the students who may need elaborate feedback the most are those least likely to opt for it. This result fits Carrier's (1974) conclusion that students may not be the best judges of what instruction they need, and how much instruction they need for effective learning to take place. Many instructional designers build MCBI programs that have elaborate feedback available, but the program only indicates to the learners when such feedback is needed. It may be necessary to force learners into elaborate or remedial instruction loops if they are making a significant amount of errors on activity questions or posttests. (p. 19)

The findings from the study of Belland et al. brings one to reassess underlying assumptions of the ATI hypothesis and its experimental paradigm—namely, that optimal learning outcomes for learners of high versus low ability/aptitude may be a function of program control or
learner control per se. Indeed, even the assumption that aptitude is a critical variable around which to organize the LOC issue is brought into question. The findings of Belland et al. indicated a possibility that optimal learning outcomes for adult learners in CAI may be less a question of aptitude, or even of LOC, and more a function of a strategic principle—forced rehearsal of input in response to learner errors—regardless of learner aptitudes.

While the paradigm that Belland et al used was an alternative to the ATI approach to LOC analysis, it need not preclude incorporating elements of aptitude and/or learner trait analysis as well if so desired by the researcher(s). Seidel et al. (1975), for example, investigated the effect that varying degrees of learner control over instructional sequence (from 0-4 options in different combinations apart from linear progression) in CAI would have on achievement in 80 adult novice students of COBOL programming. Seidel et al. used a system of analysis that utilized elements from both the ATI studies and the procedures used by Belland et al. In keeping with an ATI paradigm, subjects were pre-categorized as "high" or "low" on an aptitude measure for programming ability as well as in three other learner-trait domains (i.e., motivation, reading comprehension, and a "structure of intellect" measure). Unlike the ATI approach, however,
Seidel et al. did not choose to incorporate any of the learner variables into a factorial design; rather, all subjects were simply assigned randomly to one of 16 LOC treatment conditions. As in the study by Belland et al., the focus of the study was the 20 highest performers and 20 lowest performers on the criterion variable of interest: ability to program in COBOL. Once the high and low performers were identified, their aptitude scores and other learner-trait measures were then examined—a posteriori, as it were—for the sake of determining the extent to which any of said traits might have interacted with performance at the two extremes. Discrimination analysis revealed that, in particular, programming aptitude, verbal reasoning on the structure-of-interest test, and vocabulary on the reading test were possessed in a much higher degree by the high performers than the low performers.

In addition, Seidel et al. reviewed the learning behaviors of the high and low performers with respect to three aspects: pacing, self-assessment of performance, and manner of option use. With respect to pacing, the high performers worked at a significantly faster rate than did the low performers. With respect to self-assessment, high performers were significantly more accurate in predicting and recognizing their own particular problem areas than were low performers. With respect to option use, Seidel et al. discovered that despite the fact that subjects who
performed the best apparently used options more **effectively** than those who performed least, the low performers were the ones to choose options for **reviewing** and **quizzing** much more frequently than the high performers. This unexpected observation, coupled with their observations on difference in self-assessment abilities between high and low performers, led the researchers to suggest—at least with respect to instruction in COBAL programming for certain tasks—that "if options aid learning at all, the gain is due not to how often they are used but rather to **where** and **when** they are used" (p.30). They further suggested that the "when" and "where" of applying a given instructional variable cannot be assumed to be generic to all disciplines, nor even to all tasks within a given discipline. In an appeal for more extended and detailed research in LOC, they stated that

> It is quite clear that a taxonomy is required. . . . Thus, separate studies should be done to compare these various kinds of instructional tasks relative to the learner control variable before drawing any conclusions across instructional tasks. Also, the specific content to be learned is a related area that needs clarification **v.i.s.a.v.i.s** its relationship to learner control. (pp. 43-44)

Finally, Seidel et al. considered the following: that an ideal model of instruction within its respective discipline may be one in which program intervention or
control would be designed after principles discovered from observing the behavioral tendencies of the most successful learners.
Chapter III
DESIGN AND PROCEDURES

Population and Sample

The target population for the study was learners of beginning Spanish at the college level. At The Ohio State University the courses designated for beginning levels are Spanish 100 and Spanish 101. In both courses the same textbook (Puntos de Partida, Knorre and Dorwick. New York: Random House, 1985) and grammatical sequence of instruction are implemented. The major distinction between the two courses is that Spanish 100 students are taught at a slower pace, in that said students are presumed to have had no foreign language instruction at the high school level, whereas no such presumption is made for students of Spanish 101.

Originally, it was thought that students of Spanish 100 would be more suitable subjects for the study in that they would represent a more homogeneous group in terms of a uniform lack of previous foreign language experience. Upon examining records of students enrolled in the beginning courses Spring Quarter, 1986, the researcher discovered that both Spanish 101 and Spanish 100 courses consisted of
naive foreign language learners as well as learners with some previous instruction in Spanish (or another foreign language). Consequently, because in Spanish 101 there were considerably more enrollees from which to draw a sample, subjects were selected from among the four sections of Spanish 101 taught Winter Quarter, 1986.

By the middle of the sixth week of Winter Quarter when data were collected, Spanish 101 students were on the second of the three long chapters to be covered in Puntos de Partida over ten weeks. In addition, by that time the textbook had introduced only 19 of the 48 vocabulary items used in the videodrama (not counting articles, prepositions, pronouns, forms of the copula verb, sí, no, and six short adjectives or adverbs).

Data for the study were collected outside of classroom time; volunteers therefore had to be solicited by offering guaranteed extra credit in Spanish, as prearranged by the researcher with both the course coordinator and the individual instructor. It was from the list of volunteers obtained that the particular groups of interest, namely, high and low performers, were identified as those from which to obtain subjects. In keeping with the statistical design that corresponded with the questions of this study, an approximately equal number of subjects was assigned to each of the three experimental conditions: low performers under PC (n = 8), low performers under LC (n = 8), and high
performers under LC (n = 9). The high performers under LC were included specifically for contrastive purposes; that is to say, to test the hypothesis that low performers would opt against corrective feedback more frequently than high performers. Furthermore, because this particular study focuses on whether low (rather than high) performers in Spanish may benefit more from a learning exercise when forced to receive feedback for errors, high ability learners were not assigned to the PC treatment.

All examinations taken in Spanish 101 at the Ohio State University are common to all sections. It therefore seemed reasonable to define achievers of approximately the top third of scores on the first midterm (taken the fourth week of the quarter) as "high performers" and the achievers of approximately the bottom third of midterm scores as "low performers." Once the midterm scores of all student volunteers were accessed from the department (outside of the volunteers' knowledge), it was calculated that achievers of a 94 percent or above qualified as "high performers" (comprising the top 31 percent of volunteers) and that the achievers of a 74 percent or below qualified as "low performers" (comprising the bottom 30 percent of volunteers).

Among the 23 initial volunteers who qualified as low performers, three candidates subsequently became unavailable due to dropping the course, and two candidates
later refused to participate due to expressed loss of interest. Furthermore, of the 18 remaining candidates who had later confirmed their willingness to take part in the study, two never made their appointments despite repeated calling and rescheduling by the researcher. Consequently, there were only 16 available low performers from which to assign across the two LOC treatments (eight per cell). Furthermore, the mortality of the two subjects last described accounts for the slightly uneven distribution of subjects (8/8/9) across the three experimental conditions; had the two low performance volunteers come as scheduled, the distribution across conditions would have been even (9/9/9).

It is perhaps significant to note that despite having been reminded both the night preceding and the day of their scheduled appointment, six of the scheduled low performers needed to be called again and rescheduled because they had failed to make their initial appointments. Furthermore, as previously discussed, of the six low performers who were rescheduled, two never appeared. It is an interesting observation given the fact that with the promise of extra credit in Spanish as compensation for their participation, one might expect that out of need the low performers would have been more compelled than high performers to participate in the study. Ironically, just the converse was the case: among the 25 initial volunteers who qualified as
high performers, all nine candidates who were invited to participate followed through with the exercise. Among these nine high performers, only one needed to be called again for rescheduling. In short, it appears that although low performers stood to benefit more from the extra credit—if not from the practice in Spanish—than did high performers, the latter followed through on participation notably more than the former. The potential significance of this observation may be related to the broader issue of differential behavior between high and low performers where taking advantage of instructional options is concerned.

Methods and Materials

The Videodrama

The IAV lesson was designed from a videotaped portion of "Hablamos Español," a television series made for the purpose of teaching Spanish in a grammatically linear sequence that progresses from beginning to advanced levels. The series is divided into short lessons that are comprised of comical episodes, one to four minutes each. Every lesson emphasizes particular grammatical features and vocabulary, incorporated into the skits in as close a style to the natural redundancy of language as possible. New vocabulary and linguistic forms are introduced through their use in the context of both the physical environment and the
situation. All the actors who participate in the series are natives of a cross-section of Spanish-speaking regions.

The portion to be used for the study lasted three minutes, 45 seconds and came from Lesson Five of a series for beginners. The videodrama, entitled "What-a-Gas" by the researcher, centers on the interaction between the owner of a gasoline station (Paco), his family who lives at the station, and a travelling young couple who stop by for a fillup. After filling the car with gas, Paco checks the engine and informs his patrons that the car needs a change of oil. He is about to provide the service when he realizes that it is time for the midday meal (la comida). In light of his discovery, he awkwardly extricates himself from following through with the oil change but insists that the couple join him and his family for la comida. The next scene immediately appears in which Paco, his wife, and his eight children are dining at the table and engaged in courteous "small talk" conversation until Paco's youngest child accidentally drops a piece of fruit into his father's lap. (For a transcript of the videodrama, see Appendix A.)

**Procedures**

A total of 25 students from the four sections of Spanish 101 Winter Quarter, 1987, participated in the study. The 16 low performers were distributed randomly across two conditions: program control (obligatory video
feedback for errors) and learner control (optional video feedback for errors). The nine subjects who were randomly selected from the available list of high performers were assigned to the learner control treatment. Inasmuch as the problem addressed in this particular study does not formally concern itself with the learning behavior of high performers under forced feedback (PC), and given constraints on both available equipment and time for data collection, high performers were not tested under the PC condition.

During the volunteer recruitment period, potential subjects were told both the general nature of the IAV medium and that the purpose of their participation would be to help material developers ascertain the appropriateness of certain IAV materials for future beginning Spanish college courses. Prior to and during the experiment, subjects were not informed that they were to be part of an experimental study consisting of two treatments. Not until after the experimental data had been collected were subjects informed of their primary role in the study. In accordance to regulations established by the Human Subjects Committee at The Ohio State University, however, once subjects were made aware of their participation in the study, each was given the opportunity to have the particular data collected on him/her withdrawn and excluded
from analysis. No such request for data withdrawal was made.

Once subjects were selected and the experiment initiated, members of both learner control and program control conditions individually went through the initial stages of the IAV program in the same manner. The program is described as follows: Each subject was welcomed and told that the objective of the lesson was to help develop listening comprehension skills/strategies for Spanish through a videotrama (s)he was about to see. Prior to the showing of the videotrama, the subject was encouraged to hypothesize the meanings of language input to be used in the drama through linguistic cues such as cognates and through extralinguistic cues such as the physical and situational settings. After the subject was given a brief introduction to the scenario to be shown, (s)he was directed to a handout of the videotrama's major vocabulary words in Spanish (i.e., nouns, descriptive adjectives, adverbs, and non-copula verbs) that were listed in the order in which they would be heard during the videotrama (see Appendix B). From this list the subject was asked to write down, in red, an English equivalent beside each Spanish word that (s)he recognized or of whose meaning (s)he felt fairly sure. Once the subject signalled the program that (s)he was ready to proceed, the program alerted him/her that the video drama was about to be shown.
Prior to the showing, however, it instructed the subject that while the drama was in progress, (s)he should listen particularly for those vocabulary items for which (s)he had not written an English equivalent, and to record (in the standard blue or black ink) his/her hypothesized meaning of the vocabulary on the basis of what (s)he heard and observed on screen.

After viewing the videodrama, the subject was instructed to view it again with less focus on language as isolated vocabulary units and more focus on language functioning as an integrated system in a communicative capacity. Immediately following this second showing, the subject was informed that (s)he would be asked some practice questions on the events of the drama in order to test his/her own comprehension skills. The format/structure of these questions and the feedback components that corresponded with the two treatments are described in the section to follow. The computer printouts of each treatment, including the practice questions themselves, can be found in Appendix C (Learner Control) and D (Program Control).

The (Manipulated) Independent Variable: LOC Over Corrective Feedback

In order to provide an adequate explanation of the corrective feedback variable, it is first necessary to describe the format of the practice questions, of which feedback is a component. The practice questions consisted
of 21 type-in keyed response items. The term "keyed" refers to certain key words that the computer was programmed to recognize as indicators of an appropriate response to a given question. Validation of the 21 questions themselves and the discovery of which key words the computer should be programmed to recognize were accomplished during both a pre-pilot and pilot study, during which time both beginning learners of Spanish (from Spanish 100 and 101) and three competent instructors of Spanish tried out the questions for their comprehensibility, appropriateness of difficulty or beginning college learners, and feasibility for programming (see p. 73).

Under both learner and program control conditions, correct responses by the subject resulted in affirming comments from the program and automatic branching to the next practice question. Incorrect responses resulted first in the program's alerting the subject that (s)he had made an error. The feedback mechanism then responded in one of two ways, depending on whether the particular subject was under the learner or program control treatment.

**Incorrect Response under Learner Control Treatment**

Once the program under learner control alerted a subject of his/her inappropriate response, the program asked the subject whether or not (s)he wanted to have the relevant portion of the videotape replayed (i.e.,
corrective feedback) and offered another chance to respond to the question. In the event that the subject did not choose to receive the feedback/try-again sequence, (s)he was branched directly to the next question without further commentary on the item missed. If the subject opted for the feedback/try-again sequence, the program rewarded a correct response by informing the subject of his/her success and then proceeded to the next question. If, however, the subject attempted another response and failed a second or third time, the program would treat the error in the same way it treated the first: by informing the subject of his/her error and allowing the subject either to access the feedback/try-again sequence or to proceed to the next question. In the event that the subject failed to provide an acceptable response by his/her fourth attempt, the program would inform him/her that the response was incorrect and without further explanation proceed to the next question. A subject who ultimately failed to provide an acceptable response to a given question would not at any point be rewarded with the program's provision of the correct response.

Incorrect Response under Program Control Treatment

Once a subject under program control committed an error and was informed accordingly, the subject was branched to corrective feedback and requested to respond once again to
the same question. In the event that the subject responded incorrectly to the question a second or third time, (s)he would be looped once again through the same sequence just described. In the event that the subject responded incorrectly on yet his/her fourth attempt, the program informed him/her that the response was incorrect and proceeded directly to the next question.
Figure 2. Flowchart: Feedback Component under Program Control
DIRECTIONS

ENTIRE VIDEOGRAPH

DIRECTIONS

REPEAT ENTIRE VIDEOGRAPH

PRACTICE QUESTIONS 
& STUDENT RESPONSE

ANSWER CORRECT 
(NO. 1-20) YES

NEGATIVE FEEDBACK

POSITIVE FEEDBACK

NEXT PRACTICE QUESTION

START: DIRECTIONS

Option 1: See relevant video segment Corrective feedback and try question again.

Option 2: Proceed to next question

Figure 1. Flowchart: Feedback Component under Learner Control
Subjects under both LOC conditions were assured of the correct response to any given practice question only if they themselves could produce it. Such a seemingly cold procedure may be questionable from a pedagogical point of view; nonetheless, it was necessary to follow that procedure in order to ensure that the treatment effects in learning outcomes would be attributable to the feedback response to error variable as influenced by LOC, and not to the program's ultimate disclosure of the right response. The differential treatment of the feedback variable across the two experimental conditions can be summarized as follows: members of the program control group were obliged to receive video feedback and to respond again to the question every time they responded inappropriately; members of the learner control group were able to opt for or against the feedback/try-again sequence before proceeding to the next question.

Unknown to the subjects, during individual treatments the computer was recording on disk each subject's answers as well as the following information: (a) number of correct responses, (b) number of errors, and (c) number of times video feedback was received. From this information the researcher calculated the quitting index (Q.I.) for each subject. As mentioned earlier, while the Q.I. for subjects under program control was predetermined at zero, the Q.I.
for members under learner control was variable. To ensure against any possible errors in computer scoring due to hardware failure, software failure, or a previous oversight in programming (with respect to how the computer was directed to read input), treatment score protocols were cross-checked by the researcher item by item. Minor errors in scoring, therefore, were detected and corrected.

The Cognitive Dependent Variables: Listening Comprehension and Vocabulary Assimilation Measures

The first dependent variable, listening comprehension of the videodrama, was measured by the number of correct responses scored by subjects on a follow-up sentence completion. The exercise was presented in passage format but in effect solicited the same information that was asked in the 21 practice questions during treatment. The lowest possible score on this variable therefore was zero and the highest possible score was 21. In order to secure a valid measure of treatment effect on the comprehension variable, it was necessary to test for information as close as possible to what was tested during treatment. Difference in testing format (i.e., from 21 individually numbered questions to 21 unnumbered sentence completions embedded in a passage) was used, however, for two reasons: (a) to avoid or reduce for the subject a sense of task repetition, potentially leading to a lower level of task motivation,
and (b) to avoid or reduce for the subject a sense of the correct answer by associating the structure of the second test with that of the first test (i.e., practice questions). For a copy of the posttest measuring comprehension, see Appendix E.

Listening comprehension posttests were scored by the researcher. Ten of the 25 posttests, however, were drawn randomly and scored by another rater (i.e., a competent Spanish instructor trained for the task by the researcher) as well. An interrater reliability coefficient of .96 was found for said tests and therefore considered an acceptable indicator of reliable scoring procedures by the researcher on all listening comprehension posttests.

The second dependent variable, vocabulary assimilation, was determined by calculating the percentage of first-time vocabulary items adequately identified in English by the subject following treatment. "First-time" vocabulary items refer to those items that the subject did not already know (i.e., could not identify successfully) prior to viewing the videotrama. Hence, any item not defined correctly in red on the vocabulary handout distributed prior to the videotrama's first showing (see page 57) counted as a "first-time" vocabulary item. The posttest itself was taken on a (blank) duplicate copy of the handout used during treatment (see Appendix F).
All vocabulary assimilation posttests were scored by the researcher. Ten of the posttests, however, were selected randomly and scored by another rater (a competent Spanish instructor trained for the task by the researcher) as well. An interrater reliability coefficient of .93 was found for said tests and therefore considered an acceptable indicator of reliable scoring procedures by the researcher on the vocabulary assimilation posttests.

The Affective Dependent Variable: Attitude Toward Instruction

The attitude variable was considered an essential part of this study, in light of the consideration that improved student achievement resulting from improved instruction may not necessarily lead to positive student response. That is to suggest that, in concordance with the standpoint of other LOC studies, comparing learning outcomes of subjects under the two feedback conditions is not enough without considering how these conditions might be impacting students' learning outcomes on an affective level. If, for example, a program control format were in fact to result in higher achievement for low performers, but subsequently were to render a student resentful, frustrated, or anxious to exit the learning task, the intrinsic value of the instruction must be placed into question. That is to say, the negative impact of the experience might well outweigh the learning benefits, particularly if the experience risks
extinguishing the desire to continue learning in the discipline.

In light of the above statement, the researcher developed a questionnaire intended to measure subjects' attitude toward instruction under the two feedback conditions. The original instrument consisted of 16 items, devised to focus on the learners' reaction to overall instruction in general and to the feedback treatment in particular. Consultation with an expert in the field of foreign language education resulted in the decision to eliminate two items for their lack of construct validity. The remaining 14 items were administered to subjects who participated in the second pilot study (see page 72). Subsequently, the items were submitted to item analysis, which verified their appropriateness (reliability on internal consistency) for the actual study (Cronbach's alpha = .8853). As a result, the actual questionnaire used during treatment likewise consisted of the 14 items, which upon a second item analysis were verified on their internal consistency (Cronbach's alpha = .8921). (For a copy of the attitude questionnaire used during treatment, see Appendix G)

Statistical Design and Analysis

In this study, the manipulated variable--Locus of Control--consisted of two levels: Program Control (PC),
where subjects' Q.I. by definition was fixed at zero, and Learner Control (LC), where Q.I. was subject to individual learner decisions. The assigned performer variable (as preclassified by subjects' midterm performance level) likewise consisted of two levels—high and low. Finally, the dependent variables consisted of two cognitive measures (i.e., listening comprehension and vocabulary assimilation) as well as an affective measure (i.e., attitude toward instruction).

Cronbach's alpha for the reliability measure on the attitude questionnaires was calculated by SPSX statistical software. All other statistical analyses were run on SAS statistical software.

To determine the relationship between the quitting indices of all subjects under LC and learning outcomes in both listening comprehension and vocabulary assimilation (Question 1 and 2), subjects' individual test scores were regressed on their respective quitting indices to determine whether a change in scores associated with an increase in Q.I. was in fact negative for both measures, as predicted. The performer variable was later added to the model to determine whether the two groups (high and low) were affected differently by the quitting indices.

In order to compare quitting indices of high versus low performers under LC, it was necessary to take into account that subjects who erred on more items and therefore faced
the feedback option more frequently were subject to accruing a higher Q.I. than those subjects who erred on less items—by mere virtue of having more opportunity to quit. Adjustments for differences between individual subjects on initial misses (which indicated opportunities to quit) therefore needed to be part of the operation when quitting indices of high versus low performers were compared. Initial misses referred to the number of items (out of 21) in which the subject responded incorrectly and was therefore offered corrective feedback at least once. This number would indicate the number of items in which the subject faced the decision to quit or not to quit.

To determine whether LC low performers (as preclassified by midterm scores) opted to quit more frequently than high performers when differences in initial misses were taken into account (Question 3), every subject's Q.I. was regressed on his/her quotient of initial misses and an indicator representing previous performance.

To determine whether low performers under program control scored significantly higher than low performers under learner control in both listening comprehension and vocabulary assimilation measures (Question 4 and 5) as anticipated, it was first necessary to test the hypothesis that low performers under LC would have a significantly greater Q.I. than those under PC, whose Q.I. was necessarily zero by virtue of the forced feedback
condition. This hypothesis was examined by using a one-sample t-test to compare the mean Q.I. of low performers under LC ($\bar{X}=5.25$) to the fixed index of zero. Upon confirmation that low performers' mean Q.I. under LC was in fact significantly greater than zero ($p = .011$), two-sample t-tests compared low performers scores across the two feedback conditions.

Finally, to determine whether a difference in mean satisfaction scores (i.e., attitude toward instruction) could be found--first between high and low performers under LC (Question 6), and then between low performers when under LC versus PC (Question 7)--a two-sample t-test was applied in each case. In the first case, however, it was necessary to use a t-test with unequal variance, given that low performers demonstrated much greater variability in attitude than did high performers.

An illustration of the design that was utilized for the study is depicted as follows:

\begin{center}
\begin{tabular}{c|c|c|c}
& LC & & PC \\
& of & & of \\
feedback & & feedback \\
\hline
High Performers & | & | \\
\hline
Low Performers & | & | \\
\hline
\end{tabular}
\end{center}

\textit{Figure 3. Statistical Design}
The following hypotheses of no differences between groups will be tested:

$H_0^1$ Within Learner Control, there is no relationship between Q.I. and individual scores in listening comprehension.

$H_0^2$ Within Learner Control, there is no relationship between Q.I. and individual scores in vocabulary assimilation.

$H_0^3$ Adjusting for initial misses (which indicate opportunities to quit) there is no difference in Q.I. between low performers under Learner Control and that of high performers under Learner Control.

$H_0^4$ There is no significant difference in listening comprehension between low performers Learner Control and low performers under Program Control.

$H_0^5$ There is no significant difference in vocabulary assimilation between low performers under Learner Control and low performers under Program Control.
There is no significant difference in attitude toward instruction between high performers under Learner Control and low performers under Learner Control.

There is no significant difference in attitude toward instruction between low performers under Learner Control and low performers under Program Control.

Pilot Studies

Both a pre-pilot and a pilot study were conducted the second and sixth weeks of Spring Quarter (1986), respectively. The pre-pilot was implemented as a strategy by which the researcher/programmer could both test the validity (i.e., comprehensibility, appropriateness) of the practice questions and to anticipate the most likely possibilities for correct answers prior to programming. The practice questions to be used in the treatments were deliberately designed as open-ended so as not to provide extraneous clues to subjects. It was evident, therefore, that a problem for the researcher/programmer would be to anticipate all the possible (or at least most likely) "right" ways of answering questions of this nature, and to program the computer to recognize them accordingly.
The pre-pilot consisted of ten participants (three Spanish instructors and seven beginning Spanish students) who viewed the videotrama and subsequently wrote responses to the same 21 questions to be used during treatments. Initial programming of both the practice questions and computer recognition of acceptable responses were therefore based on the input accessed through the pre-pilot.

The primary objective of the pilot study itself was to utilize student volunteers to test the overall efficiency of the resulting IAV program through which the two treatments would be administered. Given that originally the target group was to be selected from the Spanish 100 course, a total of 14 students from said course served as subjects for the pilot.

The pilot study revealed that most of the acceptable answers entered by the participants had been identified as correct by the computer. Other possible right answers, however, were discovered to have been rejected as incorrect due to an error or oversight in what the computer had been programmed to recognize. An additional discovery was that the computer was not recognizing as correct certain recurring words/constructions that were grossly misspelled or grammatically incorrect, but nonetheless acceptable from the perspective of meaning. Necessary refinements in the program, therefore, took place as a result of the input accessed during the pilot study.
In the summer quarter of 1986, what was intended to be the session for actual data collection proved to be yet another pilot session, the one that most approximated procedures described in this chapter. The process of data collection itself went smoothly, and data appeared to be representative of subject performance. Notwithstanding, the data proved to be unsuitable for the stated purpose of this particular study, which to a great extent was to observe the learning behavior of subjects subsequent to committing errors. To explain the nature of the problem on data collected, it will be helpful to reiterate the two conditions needed for satisfactory data collection. Those conditions were (a) that subjects be properly identified as high or low performers as determined by midterm scores, and (b) that treatment be administered to subjects at a sufficiently early stage of learning to ensure that subjects would commit enough errors for adequate analysis on the feedback variable.

The problem that arose with data collection was a direct result of a delay in the step that preceded it, namely preselection of subjects as high or low performers. That is to say, it was not until the third exam of the quarter that exam scores demonstrated enough of a spread to distinguish "high performers" from "low performers." Unfortunately, by that stage of the quarter (the ninth week), subjects apparently had reached a level of
sophistication in Spanish that rendered the practice questions "too easy" for most subjects: most "high" and "low" performers alike answered the questions with a relatively low margin of errors. Consequently, there were insufficient data available for analysis of the selected research questions. Insufficient data for the primary questions notwithstanding, certain data from the second pilot nonetheless proved useful. The attitude questionnaires distributed to subjects after administration of treatment and posttests were assessed by means of item analysis and thereby validated for use in this study.

Had the same syllabus (i.e., content and sequence of lessons and tests) for Spanish 101 been retained for subsequent quarters, the same problem with ill-timed data collection might have recurred with little recourse available to the researcher. As of the 1986 fall quarter, however, the Spanish department introduced a new text and syllabus for the Spanish 101 course. Fortunately, the new sequence of instruction and tests made it possible for the researcher to use the first set of midterm scores (available the fifth week of the quarter) to discriminate high from low performers at an early enough stage for most subjects to commit a substantial number of errors during treatment. Results on the data analyses are presented and discussed in the following chapter.
Chapter IV
PRESENTATION OF STATISTICAL ANALYSES
AND DISCUSSION OF RESULTS

This chapter presents results of the statistical analyses run on all hypotheses posited in the preceding chapter, as well as those run on hypotheses since added to confirm or clarify the nature of findings on the original hypotheses. In addition, this chapter will present the necessary graphs, equations, and tables that apply to data generated from the analyses; as well as general commentaries, speculations, and/or interpretations of data presented as they relate to the hypotheses posited in this study. All statistical analyses were conducted with alpha set at a probability level of .05. It should be noted that all items marked with an asterick (*) in the tables were tested against a one-sided alternative.

Prior to the presentation of results on hypotheses, it will be helpful to review means and standard deviations of all dependent variables, as well as those variables that were later identified as a means of making analyses more accurate and results easier to interpret (e.g., initial misses, total misses). Means and standard deviations on these variables are listed in Table 1. Presentation of statistical results on hypotheses will follow the table.
Table 1. Means and Standard Deviations of all Variables.

<table>
<thead>
<tr>
<th></th>
<th>HIGH LEARNER CONTROL</th>
<th>LOW LEARNER CONTROL</th>
<th>LOW PROGRAM CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening Comprehension</td>
<td>17.88 (3.62)</td>
<td>14.12 (4.64)</td>
<td>18.12 (3.09)</td>
</tr>
<tr>
<td>Vocabulary Assimilation</td>
<td>0.5041 (.1595)</td>
<td>0.308 (.1170)</td>
<td>0.4080 (.1698)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean Score</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Standard Deviation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quitting Index</td>
<td>2.55 (2.97)</td>
<td>5.25 (5.119)</td>
<td>--</td>
</tr>
<tr>
<td>Initial Misses</td>
<td>7.77 (3.49)</td>
<td>8.25 (4.46)</td>
<td>10.00 (3.29)</td>
</tr>
<tr>
<td>Total Misses</td>
<td>9.88 (5.15)</td>
<td>11.00 (5.37)</td>
<td>17.25 (6.27)</td>
</tr>
<tr>
<td>Attitude/Satisfaction</td>
<td>60.11 (4.22)</td>
<td>51.62 (9.89)</td>
<td>54.62 (5.12)</td>
</tr>
</tbody>
</table>
Within Learner Control, there is no relationship between Quitting Index and individual scores in Listening Comprehension.

Regression analysis of subjects' comprehension scores on their respective quitting indices (shown in Figure 4) reveal that when preclassified performance level is disregarded, each unit increase in the quitting index results in a decrease in comprehension score on an average of 0.78 point (see Table 2). This finding indicates that listening comprehension of all subjects is a decreasing function of Q.I. when preclassified performance is ignored. In short, upon finding a negative relationship between quitting index and comprehension scores ($p < .01$), the null hypothesis is rejected.

Table 2. Regression Analysis (Question 1): Comprehension Without Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_0$: Intercept</td>
<td>19.12</td>
<td>1.11</td>
<td>.0001</td>
</tr>
<tr>
<td>$B_1$: Q.I.</td>
<td>-0.782</td>
<td>0.20</td>
<td>.0008*</td>
</tr>
</tbody>
</table>

ADJ $R^2 = .4636$
Figure 4. Predicted Comprehension on the Basis of Quitting Index Where Preclassified Performance is Ignored (Question 1)
Table 3. Regression Analysis (Question 1): Comprehension with Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_0$ : Intercept</td>
<td>17.34</td>
<td>1.71</td>
<td>.0001</td>
</tr>
<tr>
<td>$B_1$ : Group</td>
<td>3.30</td>
<td>2.40</td>
<td>.0959*</td>
</tr>
<tr>
<td>$B_2$ : Q.I.</td>
<td>-0.612</td>
<td>0.241</td>
<td>.0123*</td>
</tr>
<tr>
<td>$B_3$ : Interaction</td>
<td>-0.463</td>
<td>0.556</td>
<td>.4148</td>
</tr>
<tr>
<td>$H_0 : B_1 = B_3 = 0$</td>
<td></td>
<td></td>
<td>.4052</td>
</tr>
</tbody>
</table>

Once performance level by preclassification is added to the model, no relationship is found between group and comprehension scores (see Table 3). In a linear model for regression analysis where Q.I. has been associated with score according to group:

Equation 1:

$$\text{Score} = B_0 + B_1 \text{GRP} + B_2 \text{QI} + B_3 (\text{GRP} \times \text{QI}),$$

and where a dummy variable has been assigned such that

$$\text{GRP} = 0 \text{ for low LC group}$$
$$\text{GRP} = 1 \text{ for high LC group},$$

substituting the respective group values results in the following linear equations:
Equation 2 for low LC:
Score = B_0 + B_2 QI.

Equation 3 for high LC:
Score = (B_0 + B_1) + (B_2 + B_3)QI.

For no difference to be found in the relationship between Q.I and comprehension scores for both groups (H_0), the linear equations for both low and high groups must show the same functional form; the lines for each must be one and the same. In order for this condition to be true (i.e., for the linear equation for the high LC group to match that of the low LC group), the values for both B_1 and B_3 in the high group equation must be equal to zero simultaneously. That is,

H_0: B_1 = B_3 = 0
H_1: B_1 ≠ 0, and/or B_3 ≠ 0.

In the case of comprehension scores, the above was found to be true (p = .4052), indicating the lines to be the same. This finding leads to the conclusion that no relationship exists between group and comprehension scores where quitting index is concerned. In short, both low and high performance groups show the same functional relationship between Q.I. and listening comprehension scores. Consequently, knowing a student's performance level does not give any additional information on the relationship between quitting indices and comprehension scores.
H₀²  Within learner control, there is no relationship between Quitting Index and individual scores in Vocabulary Assimilation.

As in the case with listening comprehension (Question 1), for no difference to be found between groups with respect to the relationship between Q.I. and vocabulary assimilation scores, the linear equations 2 and 3 (for high and low groups, respectively) must match. Again, for this condition to be so, both B₁ and B₃ must equal zero simultaneously.

Table 4 indicates that such is not the case; H₀ is rejected (p = .0361), indicating that the lines are not one and the same. It must therefore be concluded that the relationship between Q.I. and vocabulary assimilation scores is significantly different for the two groups.
Table 4. Regression Analysis (Question 2)  
Vocabulary with Group.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_0$: Intercept</td>
<td>0.3416</td>
<td>0.0672</td>
<td>.0002</td>
</tr>
<tr>
<td>$B_1$: Group</td>
<td>0.2730</td>
<td>0.0942</td>
<td>.0062*</td>
</tr>
<tr>
<td>$B_2$: Q.I.</td>
<td>-0.0063</td>
<td>0.0095</td>
<td>.2593*</td>
</tr>
<tr>
<td>$B_3$: Interaction</td>
<td>-0.0369</td>
<td>0.0219</td>
<td>.1145</td>
</tr>
<tr>
<td>$H_0 : B_1 = B_3 = 0$</td>
<td></td>
<td></td>
<td>.0361</td>
</tr>
<tr>
<td>$B_2 + B_3 = 0$</td>
<td>-.0432</td>
<td>.0235*</td>
<td></td>
</tr>
</tbody>
</table>
The regression lines for each group must therefore be considered independently. With reference to the same linear regression model presented in Question 1, the linear equation for a group's vocabulary scores must be parallel to the quitting index axis for no relationship to exist between quitting index and scores. For this kind of relationship to exist with high performers in vocabulary assimilation, $B_2 + B_3$ (representing the slope of that group's vocabulary scores) must equal zero. Substituting the appropriate parameter estimates for Equation 3 (see Table 4) reveals that on average each unit increase in the quitting index accumulated by high performers results in a decrease in vocabulary scores by .0432 point, indicating a slope significantly less than zero (p = .0235). This finding indicates that the slope of high performers' vocabulary scores is not parallel to the quitting index axis and that a significant negative relationship does exist between quitting index and vocabulary assimilation of high performers (see Figure 5).
Figure 5. Vocabulary Assimilation as a Function of Quitting Index and Preclassified Performance (Question 2)
For no relationship to exist between quitting index and vocabulary scores of low performers, the slope of this group's vocabulary scores (represented by $B_2$) also must equal zero. In contrast to the case for high performers, however, substituting the appropriate parameter estimate for Equation 2 (see Table 4) reveals that each unit increase in a low performer's quitting index results in a reduction in his/her vocabulary score by less than one percent ($B_2 = .0063$)—a slope that is not significantly less than zero ($p > .20$). This finding is indicative of no relationship between quitting index and vocabulary assimilation scores of low performers (see Figure 5).

The reasons for the discrepancy in results on the relationship sustained by quitting index on comprehension scores versus vocabulary scores (negative for high performers but nonsignificant for low performers) are unclear. It is speculated, however, that the incongruity in the respective relationships to quitting index may have been due to a fatigue factor influencing results in the vocabulary assimilation posttests—a factor to which low performers may have been more susceptible than high performers. In effect, by the time subjects were presented with the vocabulary assimilation test, they had already experienced 25 minutes to one hour of treatment as well as exposure to the comprehension posttest. In retrospect, several subjects (performance level not noted except in the
case of one low performer) were observed in fact to register anxiety, frustration, apathy, or fatigue when presented with yet another "test." Others showed evidence of feeling the pressure of time constraints, particularly those whose participation already had exceeded the expected time limit of one hour.

It is also speculated that although listening comprehension is to some extent contingent upon comprehension of vocabulary, the stated focus of the exercise was on listening comprehension as a skill requiring focus on the message as a whole rather than on the units of vocabulary that make up the message. As such, subjects may have been predisposed to attend more to comprehension of the videodrama as a whole than to new vocabulary per se. If such had been the case, assimilation of new vocabulary might have been more a result of incidental learning, to which high performers might have been more innately sensitive. This speculation is not incongruent to the finding later discussed that within Learner Control, high performers outscore low performers in vocabulary assimilation at a notable level of significance (p = .0057) as compared to the degree to which high performers outscore low performers in listening comprehension (p = .04).
H₀³ Adjusting for differences in initial misses (which indicate opportunities to quit) there is no difference between Quitting Index of low versus high performers under Learner Control.

Because quitting index is a function of the number of opportunities a given subject has to quit, the regression analysis on the above hypothesis adjusted for differences in initial misses. The model used for analysis, where

Equation 4: \( QI = B₀ + B₁ GRP + B₂ InitM + B₃ (GRP \times InitM) \), parallels that used in Question 1, the distinction being that quitting index is now the dependent variable and Initial Misses (InitM) is a covariate. As in Question 1, performance level has been defined as a dummy variable. With this adjustment, the graph presented in Figure 6 represents the expected quitting index of high as compared to low performers under Learner Control given the same number of initial misses.
Figure 6. Quitting Index as a Function of Preclassified Performance and Initial Misses (Question 3)
The analysis as indicated in Table 5 reveals that there is a group by initial miss interaction that is significant at \( p = .0027 \). Consequently, the lines relating initial misses to quitting indices are not parallel for the two groups. What is observed is that assuming an equal number of initial misses between the two performance groups under LC, the low performers tend to quit even more than high performers as the number of initial misses increases. On average a high performer's quitting index increases by .483 for every unit increase in initial misses. In contrast, a low performer's quitting index increases by 1.122, or over double that of the high performers.

### Table 5. Regression Analysis (Question 3)
Quitting Index.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>( B_0 ) : Intercept</td>
<td>-4.005</td>
<td>1.137</td>
<td>.0037</td>
</tr>
<tr>
<td>( B_1 ) : Group</td>
<td>2.805</td>
<td>1.683</td>
<td>.0598*</td>
</tr>
<tr>
<td>( B_2 ) : Initial Misses</td>
<td>1.122</td>
<td>0.123</td>
<td>.00005*</td>
</tr>
<tr>
<td>( B_3 ) : Interaction</td>
<td>-0.639</td>
<td>0.192</td>
<td>.0027</td>
</tr>
</tbody>
</table>
The regression analysis was adjusted for initial misses in anticipation of disproportionately more opportunities to quit by low performers. A two-sample t-test on initial misses between high and low performers under Learner Control, however, yields the interesting finding that there is in fact no significant difference found between initial misses of low performers ($\bar{x} = 8.25$) and those of high performers ($\bar{x} = 7.77; p = .20$). This finding further serves to suggest that group differences on quitting indices are not being confounded by the presence or absence of initial misses, commensurate with opportunities to quit.

As a step beyond the above finding on initial misses, a two-sample t-test was also taken on the total number of misses between high versus low performers. No difference was found ($p > .20$). This finding is relevant in that it suggests that the significantly greater quitting index of low performers was not being provoked by a disproportionately higher level of frustration/temptation to quit induced by committing a higher number of errors. In short, given the same total number of errors committed with Learner Control, low performers quit feedback more than high performers.

The originally surprising discovery of no differences in either initial or total misses between high and low performers under Learner Control might be attributable to the fact that much of the material presented during
treatment—as well as form of presentation—was new and unfamiliar to high and low performers alike. This condition was in fact an objective of the researcher so as to ensure that all subjects could be observed with respect to their learning behavior and/or outcomes under differential conditions of corrective feedback.

As expected, then, the first three hypotheses just discussed indicated the following: (a) that as quitting index goes up, posttest scores go down (although in the case of low performers in vocabulary assimilation, the relationship is not significant); and (b) that within Learner Control, low performers quit more often than high performers. The above tenet having been established, it seemed reasonable to expect that preclassified high performers might outperform preclassified low performers on both comprehension and vocabulary. Two 2-sample t-tests confirmed this supposition: in comprehension scores, the difference between high performers ($\bar{X} = 17.88$) and low performers ($\bar{X} = 14.12$) is significant ($p = .0436$); in vocabulary assimilation, high performers' scores ($\bar{X} = .5041$) significantly exceed low performers scores ($\bar{X} = .3086$; $p < .01$). Whereas the difference between scores of high versus low performers under Learner Control cannot be attributed necessarily to differential behavior on the quitting index, the influence of said behavior cannot be ruled out either.
There is no significant difference between Listening Comprehension scores of low performers under Learner Control and those of low performers under Program Control.

Once a one-sample t-test confirmed that in fact low performers under Learner Control demonstrate a significantly higher quitting index than those under Program Control (where Quitting Index is fixed at zero), a two-sample t-test comparing comprehension scores of low performers under the two treatments was taken. Results reveal that low performers under Program Control have a mean comprehension score of 18.125, which is significantly higher than the mean score of 14.125 discovered in the Learner Control group ($p = .031$). The null hypothesis is therefore rejected.

There is no significant difference between the Vocabulary Assimilation scores of low performers under Learner Control and those of low performers under Program Control.

A two-sample t-test revealed that vocabulary assimilation scores of low performers under Program Control ($\bar{X} = .4080$, indicating percentage of new vocabulary retained) are on average ten percent higher than those of
low performers under Learner Control ($\bar{X} = .3087$). The difference between the two groups is nonsignificant ($p = .1049$). The null hypothesis is therefore retained. Notwithstanding, the Program Control group does outscore the Learner Control group, as anticipated.

Given that within the category of "low performers" there existed a body of persons whose individual midterm scores ranged from 48 to 74 (a span of nearly 30 points), a Wilcoxon Rank Sum Test was taken to compare the two groups of low performers on this criterion variable for performance preclassification. The purpose of the t-test was to determine whether differences in learning outcomes across treatments might have been attributable to the chance occurrence that the group of low performers under PC were more natively "intelligent" than the low performer group under LC (in spite of random assignment of low performers to the two treatments). No such difference was found between groups on the midterm scores ($p > .20$); the low PC group has a mean midterm score of 61.2; the low LC group in fact has slightly higher mean midterm score of 63.7. It can be concluded therefore that the low PC group did not have an advantage on the preclassified performance variable.

A t-test comparing the respective low performance groups on initial misses was also taken; no significant difference was found between the two groups ($p = .3874$).
This finding indicates that both groups of low performers had a comparable number of opportunities to benefit from maximal feedback, the only difference being that the PC group was forcibly submitted to it. Finally, as earlier established by the group comparisons on quitting indices, the PC group did in fact have a significantly greater exposure to feedback for errors ($\bar{x}_{QI} = 0$) than did the LC group ($\bar{x}_{QI} = 5.25$). Although the above data do not provide conclusive evidence that results in learning outcomes of low performers across treatments are attributable to the presence or absence of forced feedback, they do make it more difficult to discount the influence of this variable on the amount of learning by low performers in Spanish.

As an addendum, it will be recalled from the review of the literature that Gay (1986) conducted a similar LOC study using a computer-assisted video science lesson (see page 41) and found no significant difference in scores between low performers under PC and high performers under LC. In light of Gay's finding, both comprehension and vocabulary scores of high LC performers and low PC performers were likewise compared for the present study. Results of two-sample t-tests corroborated those of Gay: no significant difference was found between the two groups in either vocabulary assimilation or listening comprehension ($p > .20$ in both cases). In the latter measure, low
performers' mean score ($\bar{x} = 18.12$) was actually slightly higher than that of high performers ($\bar{x} = 17.88$).

$H_{06}$ There is no difference in attitude toward instruction of high performers under Learner Control and that of Low performers under Learner Control.

Because attitude scores of low performers under LC show considerably more variability than those of high performers (Table 1), a two-sample t-test with unequal variance had to be applied. Results show high performers to have a mean satisfaction score of 60.11 (out of a possible 70), as compared to a mean satisfaction score of 51.63 for low performers. Under a Learner Control mode of instruction, then, high performers surpass low performers on the satisfaction variable at virtually a level of statistical significance ($p = .0504$). Had the two groups been more homogeneous on variability, the analysis might have yielded positively significant results.

In considering possible explanations that would account for a more positive attitude toward instruction by high as opposed to low performers under Learner Control, it is reasonable to speculate that the near-significant difference in attitude may be attributable to the greater degree of success (i.e., discovery of the correct answers sooner) enjoyed by high performers during the IAV exercise.
It is also possible, however, that differences in attitude may be related to an interactive effect in one or both performance groups with respect to other factors such as self esteem based on perceived ability, locus of control the learning characteristic (see pages 1, 33-35), level of motivation, etc. In other words, attitudes (as well as learning outcomes) of low and/or high performers under LOC treatments might be influenced by yet another common characteristic or characteristics apart from general (preclassified) performance level. Further studies on high and low performers are needed in order to explore these possibilities.

H07 There is no difference in attitude toward instruction of low performers under Learner Control and low performers under Program Control.

A two sample t-test comparing mean satisfaction scores of low performers when under Learner Control ($\bar{X} = 51.625$) versus Program Control ($\bar{X} = 54.375$) indicates a slightly higher satisfaction score for the Program Control group, although the difference is not statistically significant. ($p > .20$). Consequently, it can be said that while the program control treatment does not appear to improve low performers' attitude toward instruction significantly, it likewise can be stated that it does appear to improve low
performers' scores in both comprehension and vocabulary assimilation (although not significantly in the latter case) without depressing the level of satisfaction.

Summary

The first three hypotheses were concerned with the role that quitting index had in learning outcomes/behavior of beginning Spanish college students, both collectively and in their respective performance groups. It was discovered that as LC: subjects' quitting indices increased, their respective scores decreased in all cases but that of low performers in vocabulary assimilation, in which case the negative relationship sustained between Q.I. and scores was nonsignificant. It also was discovered that high performers had lower quitting indices than low performers. As to be expected in light of the above findings, high performers were shown to outscore low performers in both listening comprehension and vocabulary assimilation measures.

The next two hypotheses (4 and 5) were concerned with comparative learning outcomes of low performers when under a learner versus program controlled format of feedback. Low performers under program control outscored those under learner control in both measures, though not significantly in vocabulary assimilation. An additional finding of
particular interest was that there was no significant
difference between scores of low performers under PC and
those of high performers under LC in either measure.

The last two hypotheses (6 and 7) were concerned with
the effect that LOC feedback condition had on subjects' attitude toward instruction. When low and high performers under LC were compared on this measure, the latter showed a more positive attitude toward instruction than low performers. When low performers under LC were compared with those of like ability under PC, however, no significant difference in mean satisfaction scores was found.
Chapter V
SUMMARY AND CONCLUSIONS

This study addressed the issue of learner control versus program control of corrective feedback. The first major objective was to examine the extent to which students showing a tendency toward low performance in beginning Spanish made use of available corrective feedback when said feedback was made optional rather than obligatory. Learning behavior and outcomes of high performers under LC were likewise observed, but more for the sake of being compared to low performers under similar learning conditions. The second major objective of the study was to determine whether forcing low performers to make maximal use of available feedback (in this case, up to three times per item) would make a positive difference in their learning outcomes as compared to giving them the option to reject the available feedback offered. Learning outcomes were evaluated by both cognitive (listening comprehension/vocabulary assimilation) and affective (attitude toward instruction) measures.
Summary of Procedures

The researcher assigned subjects preclassified as high and low performers of beginning college Spanish randomly to one of two treatments, to be administered via an IAV lesson in Spanish. In the program control (PC) treatment, to which only low performers were assigned, subjects automatically received corrective feedback (i.e., a video replay) and a request to answer the question again whenever a comprehension item was answered incorrectly. In the learner control treatment (LC), to which both high and low performers were assigned, subjects had the option to accept or reject the corrective feedback offered and another chance to respond following corrective feedback. Once a subject from either group completed his/her respective treatment, (s)he completed an additional three exercises designed to measure the dependent variables of interest in order to determine the following information:

1. Whether (within LC) as subjects' quitting indices increased, their scores decreased.

2. Whether (within LC), subjects precategorized as "low performers" tended to have significantly higher quitting indices than "high performers."
3. Whether low performers' scores improved when (as in PC) the option to "quit" an item early (i.e., reject available feedback for errors) was removed.

4. Whether LOC of the feedback variable made a significant difference in attitude toward instruction.

Summary of Findings

In correspondence with the summarized research questions as outlined in the preceding section, the research yielded the following information:

1. Regardless of performance groups, quitting indices of all subjects under LC were inversely related to achievement on a significant level in the case of listening comprehension. In contrast, the negative relationship sustained between Q.I. and scores in vocabulary assimilation was observed to be significant for high performers but nonsignificant for low performers. The above findings were determined by regression analyses of subjects' Q.I. on their respective cognitive measures, where distinction between performance groups was both included and excluded from the model.
2. Within LC, low performers quit significantly more often per initial miss than did high performers. A comparison of regression analyses between the respective groups' Q.I. on initial misses under LC was the procedure applied.

3. Low performers under PC scored significantly higher than those under LC in listening comprehension, and ten percent higher (nonsignificant) in vocabulary assimilation, presumably because of the forced feedback condition. Surprisingly, further analysis indicated no significant difference in scores between low PC subjects and high LC subjects in either measure; though in listening comprehension, scores of the low performers were in fact slightly higher. Two sample t-tests were applied in each set of comparisons just specified.

4. Within LC, high performers indicated a near-significant level of greater satisfaction toward instruction then did low performers. No difference, however, was found in level of satisfaction of low performers when under the PC versus LC feedback condition. These findings were measured by means of two sample t-tests, including a t-test of unequal variance when low versus high performers under LC were compared.
Pedagogical Implications

Returning, then, to the two broader questions previously identified as being central to this thesis (page 101), the findings from this study appear to suggest the following:

(a) When granted the choice, low performers will not make as much use of available feedback for errors on an IAV lesson in Spanish as high performers given equal opportunity.

(b) Low performers' scores in cognitive measures improve (although not significantly in vocabulary assimilation) when they are forced to make maximal use of corrective feedback. Furthermore, it appears that placing low performers under the forced (PC) rather than optional (LC) feedback conditions does not have an adverse effect on attitude toward instruction.

The above report provides a basis for predicting learning behavior and outcomes of the populations represented above within the context described. It also provides a rationale for diagnosing performance tendencies of Spanish students as a means by which to prescribe instruction with respect to LOC of corrective feedback. Specifically, it appears from the above data that students
diagnosed as low performers may do better under instruction where corrective feedback is under a program controlled format.

Generalizability to other foreign language learning contexts, however, becomes difficult. Given the scarcity of literature on foreign language learning within the framework of instructional technology, it is difficult to extrapolate principles of foreign language education from so particularized a context of (IAV) instruction and to apply them to others. Clearly, extensive research in instructional design that is specific to the context of foreign language learning is needed before generalizability of this and related LOC studies become possible. Suggestions for further research as related to the questions of this study are contained in the section to follow.

Findings from this study, therefore, may presently hold fewer implications for foreign language education per se and contribute more to the already existing literature toward a theory of instructional design that may be applicable to disciplines beyond that of foreign languages alone. A brief reprisal of the literature reveals that evidence from this study concurs with previous findings that learners' instructional choices can result in poorer learning outcomes (Oliver, 1971; Fisher, 1976; Lahey, 1976; Peterson and Janicki, 1979; Carrier, Newell, and Lange,
1982). It concurs with Montanelli and Steinberg (1975), Denton and Woods (1975), and Lahey et al. (1976), who found some subjects under learner control to have neither a better attitude toward instruction nor higher level of achievement than those under program control.

On a narrower focus, it concurs with the theoretical standpoint behind the Cronbach and Snow inspired ATI studies, namely, that the decision for selecting LC versus PC instruction depends on how a subject is preclassified on dichotomous levels of a given learner characteristic determined to be sensitive to LOC. With respect to aptitude or ability level—the foremost learner characteristic(s) studied under the ATI paradigm—this study is also consistent with past ATI findings that low ability learners perform better under certain externally controlled, rather than self-determined, facets of instruction. On a narrower focus still, this study concurs with the Rakow and Ross (1979) and the Gay (1986) ATI-compatible findings of the same, when predetermined ability level is not merely general but with specific reference to the relevant discipline. Furthermore, this study lends credence to Gay's even more assertive claim that low performers under PC can outscore not only low performers under LC, but high performers under LC as well.
Finally, findings from the present study corroborate the data-supported notion forwarded by Belland et al. (1985) that "it may be necessary to force learners into elaborate or remedial instruction loops if they are making a significant number of errors on activity questions or posttests," and that "the students who may need elaborate feedback the most are those least likely to opt for it" (page 19).

Suggestions for Further Research

The focus of the present study was on low performers in beginning Spanish and their learning outcomes under a learner versus program controlled format for corrective feedback on an IAV listening comprehension lesson. High performers were included under LC treatment merely for contrastive purposes, i.e., to determine whether high performers take advantage of available corrective feedback significantly more often and enjoy a significantly higher level of success on posttests than do low performers given the same access to feedback. Although the outcome suggests that high performers may therefore not need to be forced to receive corrective feedback, replications of this study in which high performers are also subjected to a PC format would provide concrete data on the comparative effects of LC versus PC of corrective video feedback on the learning outcomes/attitudes of high performers in Spanish.
Different findings may result from replicating this study where the criterion variable(s) for determining low (or high) performers is varied. This objective may be achieved by examining various tests for preselection (e.g., standardized versus nonstandardized tests), and/or by raising the minimum acceptable score/percentile of scores for identifying low performers.

In order to better understand how the tendency to be a "high" or "low" performer influences learning behavior and/or outcomes as related to LOC, it is necessary to determine the extent to which other learner characteristics may interact with the preclassified performance variable. Suggested learner characteristics that might be investigated under a paradigm similar to this study include level of motivation, locus of control the personality trait, self-esteem (general and/or task-specific) and field dependence versus field independence.

It was discussed earlier that a fatigue factor might have affected outcomes in the vocabulary measure unduly. Replication of this study in which vocabulary assimilation is the first or only one taken will help reduce the potential influence of this factor.

Finally, the IAV program used in this study was designed so that subjects received a maximum of three corrective video replays per comprehension item answered incorrectly. Replication of this study in which the maximum
number of video playbacks per missed item is varied will help determine the possible interactive effects of this variable on quitting index of subjects under LC and on learning outcomes/attitudes of subjects under both LOC feedback conditions.

Concluding Remarks: Technology Versus Pedagogy

In the face of increasing sophistication with respect to technological capacities of educational hardware and software, there is the temptation to ask what a piece of educational equipment can do, rather than what it should do to help capitalize on the learning capacities of the individual learner. Notwithstanding, although a particular piece of instructional equipment or software package may be designed at such a level of sophistication that it can respond to the every decision of the learner on a given learning task, the literature reveals the irony that such so-called progress in instructional technology may be at the expense of the learner him/herself. Echoing previously cited comments by Seidel (1971) and Snow (1977), Carrier et al. (1985) state that:

There is an implicit assumption in many CAI design strategies that by exploiting the technological capabilities of the computer, student learning will increase. For at least one of these technological capabilities, that of allowing students to exercise their own judgement about how much instruction they need . . . this assumption may be faulty. There is little support from previous research . . . that all types of students will benefit from control over the learning
environment. What appears to be needed is a validated set of guidelines for prescribing when learner control is useful and what aspects of control will be helpful to what type of learner (p. 213).

It is not the intention of the present discussion to suggest that exploiting the technical capacities of instructional technology is necessarily erroneous or harmful; rather, it concurs with the position of Carrier et al. that "what is needed is a validated set of guidelines for prescribing and what aspects of control will be helpful to what type of learners." That is to say that in designing a program for an audience of X learning characteristic(s), the capacities of the instructional package should be engineered according to judgement based on empirical evidence of the intended learners' needs. Judgement of this kind may at times include foreclosure on learner accessibility to certain instructional options.

This study has provided evidence that those students demonstrating a tendency to be low performers in Spanish ultimately may benefit more from corrective feedback when that feedback is imposed rather than offered—at least in the case where feedback is provided in the form of video playbacks on an IAV lesson. It is hoped that the findings presented will contribute ultimately to a solid theory of instructional design pertaining specifically to the learning of foreign language, even as applied across instructional contexts.
APPENDIX A

TRANSCRIPT OF "WHAT-A-GAS"
Transcript of "What-a-Gas" (Drama)

**Major Characters:**
- **Paco**--owner of gas station/attendant
- **María**--Paco's wife
- **José Luis and Carmen**--young couple/customers visiting gas station

**Scene 1. At the Station**

José Luis--¿Está todo?
Paco--Sí, todo.
José Luis--¿Y el aceite? ¿Cómo está el aceite?
Paco--El aceite. Sí, claro, el aceite. Un momento. (checks oil)
   Tiene usted poco aceite.
José Luis--Necesito cambiar el aceite.
Paco--Cambiar el aceite. ¿Ahora? [Es] muy tarde. Es hora de comer.
José Luis--No es muy tarde. Es la una. (points to clock at station)
Paco--Este reloj no funciona bien. Son las dos. (overtly changes clock time from 1:00 to 2:00) Son las dos.
Carmen--No son las dos. Es la una y media. Y mi reloj funciona muy bien.
María (from a distance)--Paco, ¡la comida!
Paco--La comida. Es hora de comer. ¿Qué hora es, María?
María--Es la una y media.
Paco--Sí, la una y media (wipes clock with cloth and "discretely" changes the time to 1:30) Un momento--¿por qué no comen ustedes con nosotros?
Carmen--Muchas gracias, pero...

(María now enters)

José Luis (points María out to Carmen)--Su mujer.
María (aside) -- Paco . . . ¡la comida!

Paco -- María, los señores comen con nosotros.

María -- Ah, muy bien, con mucho gusto. ¡Manuela!

Manuela (from a distance) -- ¿Es Mamá?

María -- Los señores comen con nosotros. Dos platos más, por favor.

Manuela -- Dos platos. (she sets them)

María -- Dos tenedores y dos cuchillos.

Manuela -- Dos tenedores y dos cuchillos. (she sets them)

Paco -- ¡Y dos vasos!

Manuela -- Sí, Mamá, sí Papá. (she sets them)

María -- A la mesa, los señores . . .

José Luis -- Gracias.

(Scene fades out)

**Scene 2. At the Table**

Paco (to José Luis and Carmen) -- ¿Vino blanco o vino tinto?

José Luis -- Vino tinto, por favor. (Paco serves him the wine)

-- Gracias.

Paco (to Carmen) -- ¡Y usted, Señorita?

Carmen -- Agua.

Paco -- ¡Sólo agua?

Carmen -- Sí, sólo agua (Paco serves Carmen the water) -- Gracias.

(she takes a sip) José Luis, la sal por favor.

José Luis (picks up a shaker, examines it, asks María) -- ¿Es esto sal?

María -- Sí, esto es sal.

José Luis (passes salt to Carmen) -- Sal. (turns to his hosts)

Paco and María -- El vino es muy bueno.

Carmen -- Buen apetito. La comida sí está buena.

Child 1 -- Mamá, más por favor (María serves him)

Child 2 -- Mamá, más por favor (María serves him)

José Luis (to Paco) -- Sus hijos tienen mucho apetito.

Paco -- Mmmmm . . . sí, mis ocho hijos tienen buen apetito.
(Manuela enters with a basket of fruit)

Everybody-- ¡Mmmmmmmmmmmmmmmmm!
Child 1--Una naranja--
Paco--Ah, aquí está la fruta: naranjas, peras, y uvas!
Child 1--Una naranja, por favor
Maria-- Un momento, un momento! Primero los señores. Señorita?
Carmen--Una naranja, por favor. (she takes an orange)
José Luis--Una pera, por favor. (he takes a pear)
Child 1--Una naranja, por favor. (he takes an orange)
Child 2--Una naranja y una pera. (he takes an orange and a pear)

(Smallest child drops a piece of fruit in Paco's lap by mistake)

Paco--Ay, ¡Dios mío!

Everybody laughs. Scene fades out)
APPENDIX B

VOCABULARY HANDOUT FOR "WHAT-A-GAS"
todo
el aceite--
Sí, claro--
un momento--
tiene usted (irreg.)--
(from the verb tener)
poco--
necesitar--
cambiar--
ahora--
(es) tardar--
hora de comer--
Es la una--
reloj--
funcionar--
Son las dos--
Es la una y media--
lacena--
¿Qué hora es?--
comer--
mujer--
Los señores--
muy bien--

con mucho gusto--
plato(s)--
tenedor(es)--
cuchillo(s)--
vaso(s)--
(a la) mesa--
gracias--
vino blanco--
vino tinto--
agua--
sólo--
sal--
esto--
bueno/buena--
más--
apetito--
fruta--
naranja(s)--
pera(s)--
uva(s)--
primero--
¡Dios mío!
APPENDIX C

PRINTOUT OF "WHAT-A-GAS:" LEARNER CONTROL TREATMENT
Print of lesson WHATAGAS-LC

pr:leg
c:x=1
g:es
j(x:=0):credit

*start
v:slot4
v:aud1
v:init

*credit
ts:12
t:
T: WHAT-A-GAS
T:
T:
T:
T:
T:
T:
T:
u:cont
ts:f3
t:
T: This program is dedicated to Mr. Bill Gossard, whose expertise, kindness, and endless patience helped see us through.
s:30,20;30,10
u:cont

*hello
d:n$(20);b$(50);k$(25)
g:es
t:Hello! (¡Hola!) Welcome to our interactive video program designed to help you develop comprehension skills in Spanish. You and our co-star, the computer, will work together in unravelling the program.
t: Please, what is your first name?
a:$n$
c:/n$ c
c:t=0;a=0;r=0;v=0;w=0;k$="k: answer #a :: $b$";m=0
k:
Before you actually watch the segment, please use your RED PEN to jot down (on the handout) the definitions of those words you already know or are pretty sure of. Remember that some words (called cognates) resemble words we have in English and also carry the same meaning (e.g.: interesante=interesting, cafe=coffee).

Don't forget to use your red pen. When you have finished your list, please press <RETURN>.

As you observe the following segment, listen for each vocabulary item printed on your handout. Listen particularly for those words you do not already know and try to identify their meaning with what you see and hear. Observe the physical environment, observe things like gestures and facial expressions, and keep the situational context in mind at all times.

As you listen, please use your OTHER PEN (not the red one) this time, and beside each item on your handout write down what you think its most likely meaning is.

If while listening you discover or think that you might have goofed on any of the definitions you already jotted down in red, just cross it out neatly with the other pen and write your new guess beside it.

You will need to take a moment to put on your headphones now . . . . Are you ready? Let's go!
How did it go? Did you manage to figure out most of the vocabulary, or at least make educated guesses? That's all part of the language learning game.

Still, in viewing the video-drama, you may have had to attend so much to the meaning of individual vocabulary items that you did not have the chance to focus on the scenario as a whole...

So this time, you can watch and listen to the videodrama for the actual events and interactions taking place. Don't even worry about the individual vocabulary items on your list at this particular point. Just try to "catch" what's going on.

Are you ready? (Time for headphones again). Here's the second go-round, then...

Better the second time around? Hope so.

Now is your chance to check how much of the videodrama you understood. In the practice exercise to follow, you will be asked a series of questions based on what you heard and saw.
At the cue, please type, in as simple English as possible, what you consider to be an appropriate response to each question.

*P-13

Should your response to any one question be incorrect, you will have the option to view the portion of the videotrma that contains the answer, plus a chance to try at the question again. Should you choose not to accept that option, you will simply be brought to the next practice item without further ado.

*P-14

Since most of the questions refer to the characters by name, a list of the main characters with their names is provided on the reverse side of your vocabulary handout as a kind of "refresher". Feel free to refer to it as the need arises.

*P-15

Now for the practice questions. This is a good time to put on your headphones again--just in case!

Please remember to state your responses simply (my English vocabulary is limited!) Thanks.

Last

This is learner, q1a

cont

g:m380,10; t<RETURN>

as:
g: es
e:
Print of lesson LEARNER

*cont
g:m380,10; t<RETURN>
as:
g:es
e:

*answer
t:
t: (please type in your response):
a:$b$
c: a=a+1
e:

*right
t:
t:Bravo, $n$ , !correcto!
u:cont
c: a=a-1;r=1;v=v+1
e:

*wrong
t:
t:Lo siento, $n$ --incorrecto.
u:cont
e:

*record
k($<>1)$: $n$ MISSED here <--------
k: # of times shown video: #w
ks: # of incorrect answers: #a
c:t=t+a;a=0;r=0;w=0
e:

*totals
k:
k: total # of incorrect answers: #t
k: total # of correct answers: #v
k: total # video is shown: #m
k:
k:**************************************************
ks:
e:
*revq

t:
	Do you want to see the relevant part
	of video (and then try the question
	again)?

t:
th: (y/n)
as:
m:y
cy: w = w + 1; m = m + 1
e:

*q1a
k:
k: question #1
k: correct answer(s): oil

*g1
g:es
t: Question #1. According to Paco,
what service does the car need?
u:answer
m:oil
x:k$
u: right
j:y:q1end
u: wrong
j(a=4):q1end
u: revq
jn:q1end
g:es
v(x=1): find18733
v(x=1): plyb20114
j:q1

*q1end
u: record

*q2a
k:
k: question #2
k: correct answer(s): it's late, it's

time to eat

*g2
d:es
125

t: Question #2. According to Paco, why can't he provide that service?

u: answer
mj: late! eat! lunch! meal! food
j: y2
msj: dinner! supper! hungry
j: y2
msj: hungr* y
j: y2
ms: hung* ry
*y2
x: k$
uy: right
jy: q2end
u: wrong
j(a=4): q2end
u: revq
jn: q2end
g: es
v(x=1): find20001
v(x=1): plyb20309
j: q2

*q2end
u: record

*q3a
k:
k: question #3
k: correct answer(s): it's not late,
: it 's only 1:00

*q3
g: es
t: Question #3. What does Jose Luis say as he points to the clock?

u: answer
mj: not&late
j: y3
mj: isn't& late
j: y3
mj: isnt&late
j: y3
mj: %1:00%
j: y3
mj: one
k: question #4
k: correct answer(s): the clock
doesn’t work (and it’s really 2:00)
Question #5. What does Carmen say to Jose Luis about the time after Paco's comment? (Be SPECIFIC.)
The correct answer(s): it's not 2:00, it's 1:30.

*q5a
k:  
k:  question #5
k:  correct answer(s): it's not 2:00, it's 1:30.

*q5
u:Record

*j:y4
mj:two
*j:y4
mj:broke!wrong!slow!two!off!whack
*j:y4
msj:inaccurate!inaccurate!incorrect
*j:y4
msj:out&of&order
*j:y4
msj:two&o'clock
*j:y4
msj:two&oclock
*j:y4
msj:2&o'clock
*j:y4
msj:2&oclock
*j:y4
m:needs
*y4
xi:k$
uy:right
jh:q4end
u:wrong
j(a=4):q4end
u:revq
jn:q4end
g:es
v(x=1):find20307
v(x=1):plyb20752
j:q4

*q4end
u:record

*t:  Question #5. What does Carmen say to Jose Luis about the time after Paco's comment? (Be SPECIFIC.)
u:answer
mj:not&two
mj: isn't two
j: y5
mj: isn't two
j: y5
mj: not two
j: y5
mj: isn't %2
j: y5
mj: isn't %2
j: y5
mj: one & thirty
j: y5
mj: %1 & thirty
j: y5
mj: %1-thirty
j: y5
mj: not %2:00
j: y5
mj: isn't %2:00
j: y5
mj: isn't %2:00
j: y5
m: %1:30 %130
*y5
xi: k$
uy: right
jn: qSend
u: wrong
j (a=4): qSend
u: revq
jn: qSend
g: es
v (x=1): find20456
v (x=1): plyb20988
j: q5

*qSend
u: record

*q6a
k:
k: question #6
k: correct answer(s): it works
*q6
get

t: Question #6. What does Carmen say about her watch?

u: answer
mj: not! isn’t! isn’t! doesn’t
j: neg
mj: doesn’t! don’t! don’t
j: neg
mj: %accurate
j: y6
mj: %accurate
j: y6
mj: %correct
j: y6
msj: right! function
j: y6
mj: good! fine! o.k.
j: y6
mj: run! work! okay
j: y6
m: in%order
*y6
x1: k$
uy: right
jy: q6end
*neg
u: wrong
j(a=4): q6end
u: revq
jn: q6end
g: es
v(x=1): find20456
v(x=1): plyb20988
j: q6

*q6end
u: record

*q7a
k:
k: question #7
k: correct answer(s): time for the meal (come eat)
Question #7. What does Maria call out to Paco?

- answer
- eat! lunch! meal! food
- dinner! supper

Question #8. What does Paco then ask Maria?

- what time is it?

Correct answer(s): what time is it?
Question #9. What time is this conversation taking place?

Correct answer(s): 1:30
*q10a
k:
 k:  question #10
 k:  correct answer(s):  would you eat
 : with us?

q10
g: es
t:  Question 10. What does Paco ask
 : the couple after Maria’s message to
 : him?
u: answer
mj: eat! join! lunch! food! dine! meal
 j: y10
ms: supper! dinner
 *y10
xi: k$
uy: right
 jy: q10end
u: wrong
 j(a=4): q10end
u: revq
jn: q10end
g: es
v(x=1): find20987
v(x=1): plyb21646
 j: q10

q10end
u: record

*q11a
k:
 k:  question #11
 k:  correct answer(s):  Manuela,
 : daughter

q11
g: es
t:  Question #11. Who is the young
 : woman Maria calls out to?
u: answer
ms: M*nu*la! daughter! oldest
xi: k$
uy: right
 jy: q11end
u: wrong
*q12a
k:
k: question #12
k: correct answer(s): plates (or :dishes), forks, and knives <listed in :any order>.

*u:record
v(x=1):find21756
v(x=1):plyb22060
j:q11

*q11end
u:record

*q12
v(x=1):es
t: Question #12. What three kinds of :items does Maria SPECIFICALLY ask the :young woman to take out? (You need to :list all three to be correct.)
u:answer
msj:plates&forks&knives
j:y12
msj:forks&knives&plates
j:y12
msj:knives&plates&forks
j:y12
msj:forks&plates&knives
j:y12
msj:knives&forks&plates
j:y12
msj:plates&knives&forks
j:y12
msj:dishes&forks&knives
j:y12
msj:forks&knives&dishes
j:y12
msj:knives&dishes&forks
j:y12
msj:forks&dishes&knives
j:y12
msj:knives&forks&dishes
i:y12
*q12end
u:record

*q13a
k:
k:  question #13
k:  correct answer(s):  glasses

*q13
es
t:  Question #13. What does Paco add to Maria’s request?
u:answer
ms:glasses
xi:k$
uy:right
jy:q13end
u:wrong
j(a=4):q13end
u:revq
jn:q13end
es
v(x=1):find21925
v(x=1):plyb22480
j:q13

*q13end
u:record
*q14a
k:
k:  question #14
k: correct answer(s): white wine and red wine listed in any order (Note: they can also say 'white wine or red wine'.)
*q14
g:es
t: Question #14. What two choices does Faco offer Jose Luis and Carmen at the beginning of the meal scene? (Please be as specific as possible. You need to list both.)
answer
mj: white<red<wine
j:y14
mj: red<white<wine
j:y14
mj: wine<red<white
j:y14
mj: wine<white<red
j:y14
mj: red<wine<white
j:y14
m: white<wine<red
*y14
x1:k$
uy:right
jy:q14end
u:wrong
j(a=4):q14end
u:revq
jn:q14end
g:es
v(x=1):find22814
v(x=1):plyb23160
j:q14

*q14end
u:record

*q15a
k:
k:  question #15
k: correct answer(s): red wine
Question #15. And what does Jose Luis ask for to drink, specifically?

Answer: red wine

Question #16. What does Carmen specifically ask for to drink?

Correct answer(s): water
specifically ask for to drink?

question #17

correct answer(s): salt

Question #17. Carmen then asks Jose

: Luis for something. What is it?

question #18

correct answer(s): they have

: good/big appetites
Question #19. What does Maria say to the first child who asks for fruit?

Correct answer(s): guests first
msj: meal! dinner! supper
j: nil
mj: wait! moment! minute! second! first
j: y19
msj: serve! guests! adults
j: y19
m: let
*y19
xi: k$
uy: right
jy: q19end
*nil
u: wrong
j(a=4): q19end
u: revq
jn: q19end
g: es
v(x=1): find24496
v(x=1): plyb24936
j: q19

*q19end
u: record

*q20a
k:
k: question #20
k: correct answer(s): pear

*q20
g: es
t: Question #20. What fruit does Jose Luis ask for?

u: answer
m: pear
xi: k$
uy: right
jy: q20end
u: wrong
j(a=4): q20end
u: revq
jn: q20end
g: es
v(x=1): find24881
v(x=1): plyb25152
j: q20
*q20end
u:record

*q21a
k:
  question #21
  correct answer(s): orange

*q21
g:es
t: Question #21. What fruit does Carmen ask for?
u:answer
  ms: orange
  xi: k$
  uy: right
  jy: q21end
u: wrong
  j(a=4): q21end
u: revq
  jn: q21end
g:es
  v(x=1): find24881
  v(x=1): plyb25152
  j: q21

*q21end
u:record
u: totals

*qt
g:es
t:
  "THAT'S ALL, FOLKS!"
  t: PLEASE TELL YOUR ASSISTANT THAT YOU
  : ARE FINISHED WITH THE QUESTIONS. LET
  : HER TURN OFF THE COMPUTER
  t: AND THE VCR.
  t: THANK YOU, $N$ !
  j: end
*end
e:end
APPENDIX D

PRINTOUT OF "WHAT-A-GAS:" PROGRAM CONTROL TREATMENT
Print of lesson WHATAGAS-PC

pr: leg

c:x=1

g:es

j(x=0): credit

*start

v:slot4

ev:aud1

v:init

*credit

ts:12

t:

T: WHAT-A-GAS

T:

T:

T:

T:

T:

u:cont

ts: f3

t:

This program is dedicated to Mr.

Bill Gossard, whose expertise,

kindness, and endless patience helped

see us through.

s:30,20;30,10

u:cont

*hello

d:n$(20);b$(50);k$(25)

g:es

t: Hello! (!Hola!) Welcome to our

interactive video program designed to

help you develop comprehension skills

in Spanish. You and our co-star, the

computer, will work together in

unravelling the program.

t: Please, what is your first name?

a: $n$

c: /n$ c

c:t=0;a=0;r=0;v=0;w=0;k$="k: answer #a
:: $b$";m=0

k:
k: name: $n$

t: !Gracias! We are now ready to begin.
To participate in "What-a-Gas", you will need the vocabulary handout and red pen that your assistant will provide for you, and also a pen with ink of another color.

"What-a-Gas" presents a situation in Spanish that will provide you the opportunity to exercise skills in listening comprehension. The situation to be presented is less than four minutes long.

In "What-a-Gas", Jose Luis and his girlfriend Carmen have had their car towed to a service station for a badly needed fill-up. After filling the tank, the owner of the station, Paco, is kindly checking the car for any additional problems while Jose Luis observes and Carmen is sipping coffee.

The segment that you are about to see deals with the gas station scenario mentioned and will contain the key words listed on your handout. The words are listed in the sequence in which they will occur.

Before you actually watch the segment, please use your RED PEN to jot down (on the handout) the
definitions of those words you already know or are pretty sure of. Remember that some words (called cognates) resemble words we have in English and also carry the same meaning (e.g.: interesante=interesting, cafe=coffee). Don't forget to use your red pen.

When you have finished your list, please press <RETURN>.

* p-6

As you observe the following segment, listen for each vocabulary item printed on your handout. Listen particularly for those words you do not already know and try to identify their meaning with what you see and hear. Observe the physical environment, observe things like gestures and facial expressions, and keep the situational context in mind at all times.

* p-7

As you listen, please use your OTHER PEN (not the red one) this time, and beside each item on your handout write down what you think its most likely meaning is.

If while listening you discover or think that you might have goofed on any of the definitions you already jotted down in red, just cross it out neatly with the other pen and write your new guess beside it.

* extra

You will need to take a moment to put on your headphones now . . . .

Are you ready? Let's go!

* p-8

v(x=1):find18716
v(x=1):plyb25514
How did it go? Did you manage to figure out most of the vocabulary, or at least make educated guesses? That's all part of the language learning game.

Still, in viewing the video-drama, you may have had to attend so much to the meaning of individual vocabulary items that you did not have the chance to focus on the scenario as a whole . . .

So this time, you can watch and listen to the videodrama for the actual events and interactions taking place. Don't even worry about the individual vocabulary items on your list at this particular point. Just try to "catch" what's going on.

Are you ready? (Time for headphones again). Here's the second go-round, then . . .

Better the second time around? Hope so.

Now is your chance to check how much of the videodrama you understood. In the practice exercise to follow, you will be asked a series of questions based on what you heard and saw.

At the cue, please type, in as simple English as possible, what you consider to be an appropriate response to each question.
th: Should your response to any one question be incorrect, you will be shown the portion of videodrama that contains the answer, so you can have another try at the question. Fair enough?

th: Since most of the questions refer to the characters by name, a list of the main characters with their names is provided on the reverse side of your vocabulary handout as a kind of "refresher". Feel free to refer to it as the need arises.

th: Now for the practice questions. This is a good time to put on your headphones--just in case! Please remember to state your responses simply (my English vocabulary is limited!) Thanks.
*revq
  c:w=w+1;m=m+1
  e:

  *q1a
  k:
  k:  question #1
  k:  correct answer(s):  oil

  *q1
  g:es
t:  Question #1. According to Paco, what service does the car need?
  u:answer
  m:oil
  xi:*$
  uy:right
  jy:q1end
  u:wrong
  j(a=4):q1end
  u:revq
  g:es
  v(x=1):find18733
  v(x=1):plyb20114
  j:q1

  *q1end
  u:record

  *q2a
  k:
  k:  question #2
  k:  correct answer(s):  it's late, it's time to eat

  *q2
  g:es
t:  Question #2. According to Paco, why can't he provide that service?
  u:answer
  mj:late!eat!lunch!meal!food
  j:y2
  msj:dinner!supper
  j:y2
  msj:hunger*y
  j:y2
ms: hungry
*y2
x: k
uy: right
j: q2end
u: wrong
j: q2end
v(x=1): find20001
v(x=1): plyb20309
j: q2
*q2end
u: record

*q3a
k: 
k: question #3
k: correct answer(s): it's not late,
:it's 1:00

*q3
g: es
t: Question #3. What does Jose Luis say 
as he points to the clock?
u: answer
mj: not&late
j: y3
mj: isn't&late
j: y3
mj: isn't&late
j: y3
mj: %1:00
j: y3
mj: one
j: y3
mj: %1
j: y3
mj: one&o'clock
j: y3
mj: one&oclock
j: y3
mj: %1&oclock
j: y3
mj: %1&oclock
k: question #4
k: correct answer(s): the clock's not working right (and it's really 2:00)

*q4

t: Question #4. What does Paco then explain about the clock?

u: answer
mj: not! isn't! isn't! doesn't! busted
j: y4
mj: doesn't! don't! don't! ain't! aint
j: y4
mj: %2%
j: y4
mj: %2:00
j: y4
mj: two
j: y4
mj: broke! wrong! slow! two! off! whack
j: y4
msj: inaccurate! inaccurate! incorrect
j: y4
msj: out&of&order
j: y4
msj: two&o'clock
j: y4
msj: two&oclock
*q5a
k:
k: question #5
k: correct answer(s): it's not 2:00,
: it's 1:30

*q5
g: es
t: Question #5. What does Carmen say
to Jose Luis about the time after
t Paco's comment? (Be SPECIFIC).
u: answer
mj: not & two
j: y5
mj: isn’t & two
j: y5
mj: isnt & two
j: y5
mj: not & 2
j: y5
mj: isn’t & 2
j: y5
mj: isnt & 2
j: y5
mj: one & thirty
j: y5
*q6a
k:
k:  question #6
k:  correct answer(s): it works fine

*q6
g:es
t: Question #6. What does Carmen say
:about her watch?
u:answer
mj:not!isn't!isnt!doesn't
j:neg
mj:doesn't!don't!dont
j:neg
mj:%accurate
j:y6
mj:%accurate
j:y6
mj:%correct
j:y6
msj:right!function
mj: o.k. !good!fine
j: y6
mj: run! work! okay
j: y6
m: in& order
*y6
x: k$
uy: right
jy: q6end
*neg
u: wrong
j(y=4): q6end
u: revq
g: es
v(x=1): find20956
v(x=1): plyb20988
j: q6

*q6end
u: record

*k: question #7
k: correct answer(s): it's mealtime,
: it's time to eat

*t: Question #7. What does Maria call
: out to Paco?
u: answer
mj: eat! lunch! meal! food
j: y7
ms: dinner! supper
*y7
x: k$
uy: right
jy: q7end
u: wrong
j(a=4): q7end
u: revq
g: es
v(x=1): find20985
v(x=1): plyb21173
j: q7
Question #8. What does Paco then ask Maria?

What time is it?

Question #9. What time is this conversation taking place?
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mj:%1:30!%130
j:y9
msj:one&thirty
j:y9
mj:%1&thirty
j:y9
mj:%1-thirty
j:y9
msj:half&past&one
j:y9
m:half&past&%1
*y9
xi:k$
uy:right
jy:q9end
u:wrong
j(a=4):q9end
u:revq
g:es
v(x=1):find20707
v(x=1):plyb21475
j:q9

*q9end
u:record

*q10a
k:
k: question #10
k: correct answer(s): would you eat with us?

*q10
g:es
t: Question 10. What does Paco ask the couple after Maria's message to him?

u:answer
mj:eat!join!lunch!food!dine!meal
j:y10
ms:supper!dinner
*y10
xi:k$
uy:right
jy:q10end
u:wrong
Question #11. Who is the young woman Maria calls out to?

Correct answer(s): Manuela, the eldest daughter

Question #12.

Correct answer(s): plates (or dishes), forks, and knives (listed in any order).
Question #12. What three kinds of items does Maria SPECIFICALLY ask the young woman to take out? (You need to list all three to be correct.)

Answer:
- plates & forks & knives
- forks & knives & plates
- knives & plates & forks
- forks & plates & knives
- knives & forks & plates
- plates & forks & knives
- forks & plates & knives
- forks & knives & plates
- dishes & forks & knives
- forks & dishes & knives
- knives & forks & dishes
- dishes & knives & forks

Correct answer(s): glasses
Question #13. What does Paco add to Maria's request?

Answer: glasses

Question #14. What two choices does Paco offer Jose Luis and Carmen at the beginning of the meal scene? (Please be as specific as possible. You need to list both.)

Correct answer(s): white wine and red wine
Question #15. And what does Jose Luis ask for to drink, specifically?

*q15a
k: question #15
k: correct answer(s): red wine

*q15
g:es
t: Question #15. And what does Jose Luis ask for to drink, specifically?
u:answer
m:red wine
x:i:k*
uy:right
jy:q15end
u:wrong
j(a=4):q15end
u:revq
g:es
v(x=1):find22851
v(x=1):plyb23102
j:q15

*q15end
u:record

*q16a
k: question #16
k: correct answer(s): water

*q16
g:es
t: Question #16. What does Carmen
specifically ask for to drink?

u: answer
m: water
xi: k$
uy: right
jy: q16end
u: wrong
j(a=4): q16end
u: revq
g: es
v(x=1): find23023
v(x=1): plyb23356
j: q16

*q16end
u: record

*q17a
k:
k: question #17
k: correct answer(s): salt

*q17
g: es
t: Question #17. Carmen then asks Jose
: Luis for something. What is it?
 u: answer
m: salt
xi: k$
uy: right
jy: q17end
 u: wrong
j(a=4): q17end
 u: revq
g: es
v(x=1): find23376
v(x=1): plyb23364
j: q17

*q17end
u: record

*q18a
k:
k: question #18
k: correct answer(s): they have
: good/big appetites
Question #18. What does Jose Luis comment to Paco about the children?

msj: good appetite
j:y18
msj: big appetite
j:y18
msj: good appetite
j:y18
msj: big appetite
j:y18
mj: eat well
j:y18
mj: eat good
j:y18
mj: good eater
j:y18
mj: eat a lot
j:y18
mj: eat a lot
j:y18
mj: like eat
j:y18
mj: love eat
j:y18
msj: hungry
j:y18
msj: hungry
j:y18
ms: hungry
*y18
x: k$
y: right
jy: q18end
u: wrong
j(a=4): q18end
u: revq
g: es
v(x=1): find23867
v(x=1): pylb24494
j: q18

*q18end
u: record
*q19a
k:
k: question #19
k: correct answer(s): guests first

*q19
g:es
t: Question #19. What does Maria say to the first child who asks for fruit?
u:answer
mj: eat! finish! food! lunch
j: nil
mj: meal! dinner! supper
j: nil
mj: wait! moment! minute! second! first
j: y19
msj: serve! guests! adults
j: y19
m: let
*y19
xi: k$
u: right
jy: q19end
*nil
u: wrong
j(a=4): q19end
u: revq
g: es
v(x=1): find24496
v(x=1): plyb24936
j: q19

*q19end
u: record

*q20a
k:
k: question #20
k: correct answer(s): pear

*q20
g: es
t: Question #20. What fruit does Jose Luis ask for?
u: answer
m: pear
xi: k$
*q21a
k:
k: question #21
k: correct answer(s): orange

*q21
g:es
t: Question #21. What fruit does Carmen ask for?
 u:answer
ms:orange
x:ki$
uy:right
jy:q21end
u:wrong
j(a=4):q21end
u:revq
g:es
v(x=1):find24881
v(x=1):plyb25152
j:q21

*q21end
u:record
u:totals
"THAT'S ALL, FOLKS!"

Please tell your assistant that you are finished with the questions. Let her turn off the computer and the VCR.

Thank you, $N$!
APPENDIX E

LISTENING COMPREHENSION MEASURE
Listening Comprehension Measure

(To the subject:)

Directions: Please complete each sentence in English in a way that best represents your understanding of the videodrama you saw. Do not judge how long or short each answer should be by the length of each blank—all blanks are the same length. Just complete each item the best you can.

At the station ...

Paco and José Luis decided that the car _______________. Paco, however, explained that this was not possible because _______________. José Luis pointed to the clock and said that _______________. Paco responded by saying that _______________. After Paco's comment, Carmen ran up to José Luis and said _______________. According to Carmen, her watch _______________. María then called out to Paco to tell him _______________. Paco then asked María ______________(326,687),(416,731). María's answer was _______________. It then occurred to Paco to ask José Luis and Carmen _______________. María called
out to the young woman, who was (identify her) ______________________
____________________________. Then María asked the young woman to bring
out three items, which were ______________________________
____________________________, and __________________
____________________________. Paco asked the young woman also to ___
_______________________________.

At the table . . .

At the beginning of the table scene, Paco offered José Luis and
Carmen __________________________ or __________________________
____________________________. José Luis asked Paco for ____________
____________________________. Carmen asked Paco for ______________
____________________________. Carmen then turned to José
Luis and asked him for ______________. José Luis told his host and hostess that the children
____________________________. When the first child asked María
for fruit, María __________________________. José
Luis' preference for fruit was __________________________. Carmen's preference for fruit was __________________________.
APPENDIX F

VOCABULARY ASSIMILATION MEASURE
Vocabulary Assimilation Measure

(To the subject:)

(NAME)

Directions: In the space next to each word in Spanish, write what you consider to be an accurate equivalent or definition in English.

1. poco
2. cuchillos
3. hora de comer
4. ¡Dios mío!
5. tiene usted
6. ahora
7. apetito
8. el aceite
9. cambiar
10. vino blanco
11. agua
12. con mucho gusto
13. Es la una y media
14. Es la una
15. todo
16. un momento
17. la sal
18. naranjas
19. necesitar
20. vino tinto
21. peras
22. muy bien
23. (a la) mesa
24. Sí, claro
25. (Es) tarde
26. bueno
27. comer
28. más
29. tenedores
30. mujer
31. Son las dos
32. esto
33. primero
34. reloj
35. ¿Qué hora es?
36. platos
37. la comida
38. vasos
39. gracias
40. Los señores
41. uvas
42. sólo
43. fruta
44. funcionar
APPENDIX G

ATTITUDE TOWARD INSTRUCTION MEASURE
Likert Scale: Attitude toward Instruction

Indicate whether or you agree or disagree with each of the following statements by placing an "X" at the appropriate place on the scale under the statement.

1. This exercise was a fun language-learning experience.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

2. I would like to see more instruction of this kind developed.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

3. The instant replays annoyed me.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

4. If I had had the chance, I would have quit the program before it ended.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

5. I found the exercise to be stimulating.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

6. I would rather have had this drama presented in a textbook than to experience it on video.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree

7. I found the questions to be too difficult.
   - Strongly Disagree   [ ]   No Opinion   [ ]   Agree   [ ]   Strongly Disagree
   - Disagree
8. The feedback (instant replays) is a valuable feature of the experience.

Strongly Disagree No Opinion Agree Strongly
Disagree

9. I resented being asked to participate in a program that involved so much unfamiliar vocabulary.

Strongly Disagree No Opinion Agree Strongly
Disagree

10. This exercise kept my attention well.

Strongly Disagree No Opinion Agree Strongly
Disagree

11. This exercise is helpful in developing listening comprehension skills.

Strongly Disagree No Opinion Agree Strongly
Disagree

12. Seeing repeats of scenes usually helped me to put things together.

Strongly Disagree No Opinion Agree Strongly
Disagree

13. Being expected to learn better language skills from this exercise was unrealistic.

Strongly Disagree No Opinion Agree Strongly
Disagree

14. Looking at those instant replays bored me.

Strongly Disagree No Opinion Agree Strongly
Disagree
LIST OF REFERENCES


